Franklin
Cummings
Tech

2023 -2024
Course Catalog

2023-2024
Course Catalog

Information, Policies, Programs,
Courses, and Faculty of the
Benjamin Franklin Cummings Institute of Technology

41 Berkeley Street
Boston, Massachusetts 02116

Telephone: 617.423.4630

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https://www.franklincummings.edu

The BENJAMIN FRANKLIN CUMMINGS INSTITUTE OF TECHNOLOGY reserves the right, in its sole judgment, to make changes of any nature in its programs, calendar, or academic schedule whenever it is deemed necessary or desirable, including changes in course content, the rescheduling of classes with or without extending the academic term, canceling of scheduled classes and other academic activities, in any such case giving such notice thereof as is reasonably practicable under the circumstances. This catalog contains current information regarding the calendar, admission, degree requirements, fees, regulations, and course offerings. The policy of Franklin Cummings Tech is to give advance notice of change, whenever possible, to permit adjustment. However, Franklin Cummings Tech reserves the right to make changes at anytime when it is deemed advisable. Requests for the college's audited financial statements should be directed to the President's Office at 617-588-1369.

Equal Opportunity Policy

Benjamin Franklin Cummings Institute of Technology policy prohibits discrimination on the basis of race, creed, color, religion, national origin, ancestry, sex, age, marital status, veteran status, political belief or affiliation, criminal record (applications only), CORI check results, mental or physical disability, pregnancy, retaliation, sexual harassment, sexual orientation, gender identity or expression and genetic information and any other class of individuals protected from discrimination under state and federal law. This policy extends to all rights, privileges, programs, and activities including admission, employment, financial assistance, and educational programs.

Inquiries concerning the application of these laws to BENJAMIN FRANKLIN CUMMINGS INSTITUTE OF TECHNOLOGY should be addressed to the Equal Employment Opportunity/Affirmative Action Officer, who is the Human Resources Director, 41 Berkeley Street, Boston, MA 02116.

Family Educational Rights and Privacy Policy

Franklin Cummings Tech complies with the Family Educational Rights and Privacy Act, also known as the Buckley Amendment. This act protects the rights of the student in matters of access to and release of information contained in the student's records. Questions regarding this policy should be referred to the Registrar's Office.

Profile

Type of School: Private College

Founded: 1908 under the provisions of the will of Benjamin Franklin

Enrollment: Approx. 800 day and evening students

President: Dr. Aisha Francis

Accreditation: New England Commission of Higher Education (NECHE)

ASE Education Foundation

Commission on Opticianry Accreditation (COA)

Degrees: ABET accreditation

Bachelor of Science

Associate of Science

Certificate of Proficiency

Student Profile:

Ethnic Origin	Percentage
Asian	6%
Black, Non-Hispanic	37%
Hispanic/Latino	28%
Multi-Ethnic	2%
Native American	1%
Other/Non-Disclosed	10%
Pacific Islander	0.3%
White, Non-Hispanic	17%
Gender Identity: Male	86%
Female	14%

Tuition: Associate Degree Programs $18,306 per year

Certificate Programs $18,306 per year

Bachelor's Programs $19,642 per year

Financial Aid: Federal, State and institutional aid available

Students receiving Pell Grants 61%

Location: Boston's South End neighborhood

Programs: Automotive Technology, AS

Automotive Technology, Certificate

Computer Information Technology, AS

- Cybersecurity, Concentration Networking and System Support, Concentration and Certificate
- Software Development, Concentration and Certificate

Construction Management, AS

Electrical Engineering, BS

Industrial Electronics Technology (Certificate).

Engineering Technology:

- CAD/SolidWorks, Certificate
- CNC Machining, Certificate
- Advanced Manufacturing and Automation, AS
- Building Energy Management, AS
- Mechatronics Technology, AS
- Renewable Energy Technology, AS

Health Information Technology, AS

Health Information Technology, BS

- Data Analytics, Concentration
- Public Health, Concentration

Heating, Ventilation, Air Conditioning, and Refrigeration Technology, Certificate

Opticianry, AS

Practical Electricity, Certificate

Accreditation

New England Commission of Higher Education (NECHE — formerly NEASC)

Benjamin Franklin Cummings Institute of Technology is accredited by the New England Commission of Higher Education, a nongovernmental, nationally recognized organization that accredits institutions of higher education.

Accreditation of an institution by the New England Commission of Higher Education indicates that it meets or exceeds criteria for the assessment of institutional quality, periodically applied through a rigorous review process. An accredited school or college is one that has the resources necessary to achieve its stated purposes through appropriate educational programs, is substantially doing so, and gives reasonable evidence that it will continue to do so in the foreseeable future.

Accreditation by the New England Commission is not partial, but applies to the institution as a whole. As such, it is not a guarantee of the quality of every course or program offered, or the competence of individual graduates. Rather, it provides reasonable assurance about the quality of opportunities available to students who attend the institution.

Inquiries regarding the status of an institution's accreditation by the New England Commission of Higher Education should be directed to: New England Commission of Higher Education 3 Burlington Woods Drive, Suite 100, Burlington, MA 01803-4514; 781-425-7700; https://www.neche.org/

ASE Education Foundation

The Automotive Technology program at Benjamin Franklin Cummings Institute of Technology is accredited by the ASE Education Foundation, an independent, non-profit organization with a single mission:

To evaluate technician training programs against standards developed by the automotive industry and recommend qualifying programs for ASE Education Foundation accreditation.

ASE Education Foundation; 101 Blue Seal Drive, SE, Suite 101; Leesburg, VA 20175; (703) 669-6650; Fax: (703) 669-6125; http://www.aseeducationfoundation.org

Commission on Opticianry Accreditation (COA)

The Opticianry program at Benjamin Franklin Cummings Institute of Technology is accredited by the Commission on Opticianry Accreditation.

The Commission on Opticianry Accreditation (COA), a not-for-profit agency, accredits Opticianry education in the United States.

The mission of the Commission on Opticianry Accreditation is to foster excellence in opticianry education by setting standards, assessing educational effectiveness, and identifying those academic programs that meet the standards, in order to aid programs to produce competent graduates who will provide professional services to the public.

Scope of accreditation: COA accredits two-year Opticianry degree programs and one-year ophthalmic laboratory technology certificate programs in the United States and Canada that are sponsored by post-secondary institutions accredited by agencies recognized by the Department of Education or CHEA.

Recognition: The COA is recognized by the Council on Higher Education Accreditation (CHEA, http://www.chea.org/).

Commission on Opticianry Accreditation; PO Box 592; Canton, NY, 13617; (703) 468-0566; http://www.coaccreditation.com

ABET: Engineering Accreditation Commission

The Bachelor of Science in Electrical Engineering is accredited by the Engineering Accreditation Commission of ABET. ABET accreditation assures confidence that a collegiate program has met standards essential to prepare graduates to enter critical STEM fields in the global workforce. Graduates from an ABET-accredited program have a solid educational foundation and are capable of leading the way in innovation, emerging technologies, and in anticipating the welfare and safety needs of the public.

www.abet.org

Student Complaints

The State of Massachusetts allows students the right to make a formal complaint to The Massachusetts Board of

Higher Education and they attempt to provide an avenue for informal resolution of matters concerning institutions. They cannot require an institution to take any specific action in a matter and cannot provide legal advice. However, once filed the college will be asked to follow the complaint process.

Complaint Process

The Board of Higher Education receives and refers complaints/inquiries to the specific college for clarification and response. The college's Board of Trustees has responsibility for establishing and enforcing policies necessary for the management of the institution under its authority. The management will review the complaint and investigate each matter and will meet with the student.

Before contacting the DHE, you must first exhaust the institution's internal grievance or complaint procedures. These policies are usually published in the institution's catalog, student handbook, and/or on the institution's website. After you have pursued your concerns using the institution's dispute resolution procedures, and have not reached a mutually agreeable resolution, you may proceed with filing a formal complaint with the DHE.

Public Record

Under most circumstances, the text of the complaint/inquiry will be considered a public record, a copy of which is available to any member of the public upon request. However, identifying information (e.g., name, address, phone number, etc.) will not be disclosed. Furthermore, no part of the complaint/inquiry will be discussed in response to a request that asks specifically for a complaint/inquiry submitted by an individual.

To submit a complaint, visit https://www.mass.edu/forstufam/complaints/complaints.asp

A Message from the President and CEO

Benjamin Franklin Cummings Institute of Technology is pleased to provide you with the 2023-2024 Course Catalog to help further your college-to-career journey. This catalog articulates the academic policies of the college and provides detailed information regarding our programs of study. In addition to course listings and program offerings, you will find important information regarding your responsibilities as a student.

Please take time to familiarize yourself with the contents of this publication and use it to guide you as you pursue your education. On behalf of the entire Franklin Cummings Tech community, I want to say how excited we are that you are sharing your learning journey with us.

Whether you are a first-time college student or returning to college, Franklin Cummings Tech offers a wide variety of courses that can be applied toward an associate degree, bachelor's degree, or a workforce certificate. As a technical college focused on community impact, we attract a spectrum of students, from high schoolers who enroll in dual-credit courses to 60-plus-year-olds who take classes as part of our Division of Professional and Continuing Studies. Our faculty and staff go the extra mile to provide the support and resources every student needs to fulfill their goals. We are happy to be your college of choice!

As one of the most affordable private colleges in the Commonwealth, Franklin Cummings Tech helps students earn a degree (via small classes) at a fraction of the cost of a typical university. Franklin Cummings Tech also has a robust array of workforce certificates — including Practical Electricity, HVAC&R, and more — that afford students the opportunity to earn key credentials in a year or less and then join the workforce. With a new commitment to incorporate elements of sustainability and clean technology in 90% of our programs, the technical education you earn at Franklin Cummings Tech is designed to adapt to the 21st needs of the industries in which you will make a future career. We are doing all of this with a student-centered perspective while remaining focused on our vision of: *being a best-in-class college that provides a supportive learning environment and offers an innovative, practical, and entrepreneurial education resulting in career-ready, productive, and civically-engaged citizens.*

I invite you to take advantage of all the opportunities that await you at Benjamin Franklin Cummings Institute of Technology.

Sincerely,

Aisha Francis, Ph.D.

Dr. Aisha Francis
President and CEO

2023-2024 Academic Calendar

Fall Semester 2023-24

Labor Day ..... Monday, September 4, 2023
Classes Begin ..... Tuesday, September 5, 2023
Last Day to Add Classes ..... Monday, September 11, 2023
Last Day to Drop Classes ..... Monday, September 18, 2023
Incomplete Deadline ..... Monday, September 18, 2023
Withdrawal Deadline - 7 Week ..... Friday, October 6, 2023
Indiginous Peoples' Day ..... Monday, October 9, 2023
Monday Schedule ..... Tuesday, October 10, 2023
Mid Term Ends ..... Tuesday, October 24, 2023
Fall 1 7 Week Courses End ..... Tuesday, October 24, 2023
Fall 2 7 Week Courses Start ..... Wednesday, October 25, 2023
Friday Schedule ..... Monday, November 6, 2023
Registration Begins ..... Sunday, November 6, 2022
Withdrawal Deadline - 14 Week Courses. Thursday, November 9, 2023
Veteran's Day Observed ..... Friday, November 10, 2023
Faculty Development Day (no classes) .....
Thanksgiving ..... Wednesday-Friday, November 22-24, 2023
Withdrawal Deadline - 7 Week ..... Friday, December 1, 2023
Classes End ..... Monday, December 18, 2023
Winter Recess ..... December 19-January 15, 2024

Spring Semester 2024

Returning HVAC Student - Classes Begin ..... Tuesday, January 2, 2024
M.L. King Day - Returning HVAC Students - No Class .....
Monday, January 15, 2024
Classes Begin ..... Tuesday, January 16, 2024
Monday Schedule
Last Day to Add Classes ..... Monday, January 22, 2024
Drop Deadline ..... Monday, January 29, 2024
Incomplete Deadline ..... Monday, January 29, 2024
President's Day ..... Monday, February 19, 2024
Withdrawal Deadline - 7 Week Courses
Friday, February 16, 2024
Monday Schedule ..... Tuesday, February 20, 2024
Mid Term Ends ..... Tuesday, March 5, 2024
Spring 1 Courses End ..... Tuesday, March 5, 2024
Faculty Development Day ..... Wednesday, March 6, 2024
Spring Break ..... Wednesday, March 6, 2024
Friday, March 15, 2024
Spring 2 Courses Start ..... Monday, March 18, 2024
Summer Registration Begins ..... Monday, April 1, 2024
Fall Registration Begins ..... Monday, April 1, 2024
Withdrawal Deadline - 14 Week Courses
Tuesday, April 2, 2024
Career Fair (no Classes) ..... Tuesday, April 9, 2024
Patriots Day ..... Monday, April 15, 2024
Withdrawal Deadline - 7 Week Courses .... Friday, April 19, 2024
Monday Schedule
Classes End ..... Tuesday, May 7, 2024
Graduation ..... Saturday, May 18, 2024

Summer Semester 2024

Summer Session I:

7 week session ..... May 13-Jul 2, 2024
Classes Begin ..... Monday, May 13, 2024
Last Day to Add Classes ..... Wednesday, May 15, 2024
Drop Deadline ..... Friday, May 17, 2024
Incomplete Deadline ..... Friday, May 24, 2024
Memorial Day ..... Monday, May 27, 2024
Withdrawal Deadline ..... Wednesday, June 12, 2024
Juneteenth Day ..... Wednesday, June 19, 2024
Wednesday Schedule ..... Tuesday, June 18, 2024
Thursday Schedule .....
Summer Break ..... July 3 - July 7, 2024
Independence Day ..... Thursday, July 4, 2024

Summer Session II:

7 week session ..... July 8 -August 23, 2024
Classes Begin ..... Monday, July 8, 2024
Last Day to Add Class ..... Wednesday, July 10, 2024
Last Day to Drop Class ..... Friday, July 12, 2024
Incomplete Deadline ..... Friday, July 12, 2024
Withdrawal Deadline ..... Thursday, August 8, 2024
Classes End ..... Friday, August 23, 2024

Items in Italics are specific to students in the HVAC&R Certificate program due to hour requirements associated with the program.

2024-2025 Academic Calendar

Fall Semester 2024-25

Labor Day .....Monday, September 2, 2024
Classes Begin.....Tuesday, September 3, 2024
Last Day to Add Classes .....Monday, September 9, 2024
Last Day to Drop Classes.....Monday, September 16, 2024
Incomplete Deadline .....Monday, September 16, 2024
Withdrawal Deadline - 7 Week.....Friday, October 4, 2024
Indiginous Peoples' Day .....Monday, October 14, 2024
Monday Schedule.....Tuesday, October 15, 2024
Mid Term Ends.....Tuesday, October 22, 2024
Fall 1 7 Week Courses End .....Tuesday, October 22, 2024
Fall 2 7 Week Courses Start ..... Wednesday, October 23, 2024
Friday Schedule
Registration Begins .....Monday, November 4, 2024
Withdrawal Deadline - 14 Week Courses
Thursday, November 7, 2024
Veteran's Day Observed.....Thursday, January 11, 2024
Faculty Development Day (no classes)
Thanksgiving..... Wednesday-Friday, November 27-29, 2024
Withdrawal Deadline - 7 Week.....Tuesday, November 26, 2024
Classes End.....Monday, December 16, 2024
Winter Recess..... December 17-January 14, 2025

Spring Semester

Returning HVAC Student - Classes Begin
Thursday, January 2, 2025
M.L. King Day - Returning HVAC Students - No Class..Monday, January 20, 2025
Classes Begin..... Wednesday, January 15, 2025
Monday Schedule..... Wednesday, January 22, 2025
Last Day to Add Classes ..... Wednesday, January 22, 2025
Drop Deadline..... Wednesday, January 29, 2025
Incomplete Deadline ..... Wednesday, January 29, 2025
President's Day.....Monday, February 17, 2025
Withdrawal Deadline - 7 Week Courses
Tuesday, February 18, 2025
Monday Schedule.....Thursday, February 20, 2025
Mid Term Ends.....Thursday, March 6, 2025
Spring 1 Courses End .....Thursday, March 6, 2025
Faculty Development Day..... Friday, March 7, 2025
Spring Break.....Friday, March 7, 2025-Friday, March 14, 2025
Spring 2 Courses Start .....Monday, March 17, 2025
Summer Registration Begins ..... Monday, April 7, 2025
Fall Registration Begins..... Monday, April 7, 2025
Withdrawal Deadline - 14 Week Courses
Tuesday, April 1, 2025
Career Fair (no Classes).....Tuesday, April 8, 2025
Patriots Day..... Monday, April 21, 2025
Withdrawal Deadline - 7 Week Courses....Friday, April 18, 2025
Monday Schedule
Classes End..... Tuesday, May 6, 2025
Graduation..... Saturday, May 18, 2024

Summer Session I

7 week session-May 12-Jul 1, 2024

Classes Begin.....Monday, May 12, 2025
Last Day to Add Classes .....Wednesday, May 14, 2025
Drop Deadline..... Friday, May 16, 2025
Incomplete Deadline ..... Friday, May 16, 2025
Memorial Day .....Monday, May 26, 2025
Withdrawal Deadline..... Friday, June 13, 2025
Juneteenth Day.....Thursday, June 19, 2025
Wednesday Schedule .....
Thursday Schedule..... Tuesday, June 17, 2025
Summer Break.....July 2 - July 6, 2025
Independence Day.....Friday, July 4, 2025

Summer Session II

7 week session..... July 7 -August 22, 2025
Classes Begin.....Friday, July 7, 2028
Last Day to Add Class..... Wednesday, July 9, 2025
Last Day to Drop Class .....Friday, July 11, 2025
Incomplete Deadline .....Friday, July 11, 2025
Withdrawal Deadline.....Thursday, August 7, 2025
Classes End.....Friday, August 22, 2025

Items in Italics are specific to students in the HVAC&R Certificate program due to hour requirements associated with the program.

Policies and Disclaimers

Equal Opportunity Policy

Benjamin Franklin Cummings Institute of Technology policy prohibits discrimination on the basis of race, creed, color, religion, national origin, ancestry, sex, age, marital status, veteran status, political belief or affiliation, criminal record (applications only), CORI check results, mental or physical disability, pregnancy, retaliation, sexual harassment, sexual orientation, gender identity or expression and genetic information and any other class of individuals protected from discrimination under state and federal law.

This policy extends to all rights, privileges, programs, and activities, including admission, employment, financial assistance, and educational programs, and is required by federal law including Title IX of the Educational Amendments of 1972, and section 504 of the Rehabilitation Act of 1973, and the regulations thereunder. Inquiries concerning the application of these laws to Benjamin Franklin Cummings Institute of Technology should be addressed to the Equal Employment Opportunities/Affirmative Action Officer, who is the Human Resources Director at 41 Berkeley Street, Boston, MA 02116.

Family Educational Rights and Privacy Policy

Benjamin Franklin Cummings Institute of Technology complies with the federal Family Educational Rights and Privacy Act. This law protects the rights of the student in matters of access to, and release of, information contained in the student's educational records. For more information refer to the full policy in this catalog.

Changes to this Catalog

The information in this catalog was current as of March 30, 2023. Benjamin Franklin Cummings Institute of Technology reserves the right to update, modify, and change calendars, degree requirements, course offerings, course descriptions, regulations, tuition and fees, and other information as necessary. The college will endeavor to provide timely notice of these changes to the persons affected. An updated version of this catalog can be found online at www.franklincummings.edu.

History and Mission

History

Benjamin Franklin Cummings Institute of Technology is a two-year college with a rich history built on tradition and innovation. One of the oldest technical colleges in New England, Franklin Cummings Tech owes its existence to Benjamin Franklin, who in the 1789 codicil to his will bequeathed a gift to help educate "the inhabitants of the Town of Boston." His desire was to equip young people with quality technical skills, believing that "good apprentices are most likely to make good citizens."

In 1906, aided by an additional gift from the industrialist Andrew Carnegie and land donated by the city of Boston, the managers of the Franklin Fund decided that a technical college would best accomplish Franklin's original purpose.

Benjamin Franklin Cummings Institute of Technology opened its doors to students in 1908. Since then, Franklin Cummings Tech has graduated more than 85,000 students, all of whom have benefited from its unique approach to technical education. Franklin Cummings Tech remains Dr. Franklin's living legacy to Boston.

A more extensive history of Franklin Cummings Tech can be found on our website at www.franklincummings.edu.

Our mission

We deliver transformative technical and trade education that leads to economic advancement. Our vision: To achieve economic and social impact through dynamic and entrepreneurial curricula that develop diverse tech talent for our region and to help graduates thrive by building wealth. Our values: Supporting our diverse community. Fostering a supportive learning environment.

Institutional Values

- We value our diverse community and the fostering of a supportive learning environment. We are committed to creating opportunity by working closely with industry and community partners to prepare our students for lifelong learning in an increasingly interdependent world. Our academic programs and co-curricular efforts reflect our commitment to the fundamental principles of an educated person. We value the following skills and attributes and actively promote their development through college-wide initiatives, so that each student:
- Possesses the technical skills to enter the workforce or go on to further education
- Demonstrates professionalism through leadership, a strong work ethic, and teamwork
- Communicates effectively both professionally and personally
- Utilizes critical thinking and various approaches to problem solving
- Possesses the lifelong skills to locate, evaluate and use information effectively
- Understands the impact of sustainable development
- Is globally and ethically responsible and civically engaged

Educated Person

Our academic programs and co-curricular efforts reflect our commitment to the fundamental principles of our definition of an educated person, which is someone who

1. Possesses the technical skills to enter the workforce or go on to further education;
2. Demonstrates professionalism through leadership, a strong work ethic, and teamwork;
3. Communicates effectively both professionally and personally;
4. Utilizes critical thinking and various approaches to problem solving;
5. Possesses the lifelong skills to locate, evaluate and use information effectively;
6. Understands the impact of sustainable development; and
7. Is globally and ethically responsible and civically engaged

Governance

Benjamin Franklin Cummings Institute of Technology is governed by an independent Board of Trustees reflective of the Boston area citizenry, as desired by Benjamin Franklin in his original bequest to the City of Boston. The Board presently has 18 members in addition to its ex-officio members, the Mayor of Boston, and the President of the college.

As well, the Board is aided by the continued service of its Trustees Emeriti, distinguished former members of the Board who continue their participation in many aspects of the college governance.

The Board of Trustees meets on a quarterly basis at the college. In between the Trustee meetings of the full Board, an elected Executive Committee serves in the Board's stead for needed decision-making and guidance.

Each Trustee is asked to serve on at least two Board committees. These committees convene and engage with the college during their own committee meetings, taking advantage of the specific skills possessed by the individual Trustees. Committees include Executive Committee, Governance and Strategy, Finance and Audit, Development, Real Estate and Capital, and Academic Affairs.

Four members of the Trustees are elected as officers of the Board during the Annual Meeting. These are the Chair, Vice Chair, Treasurer and Clerk. Membership of the Executive Committee and other committees is also determined at the June meeting.

The President of the college is a voting member of the Board and is responsible for the management and implementation of the policies and directives of the Board. The President has a strong consultative relationship with the Chair, the Executive Committee and members of the Trustees. The President also manages the daily operation of the college along with the Performance and Accountability Council that consists of the President's management team,

comprising the college's Dean of Academic Affairs, the Dean of Student Affairs, the Associate Dean of Admissions and Recruitment, the Chief Financial Officer, the Chief Campaign Officer and the Chief Strategy Officer.

Shared Governance

The academic executive directors meet regularly with the Dean of Academic Affairs. The faculty is involved in curriculum matters, personnel matters, and faculty development through three standing committees:

- A faculty academic advisory committee (FAAC) advises on academic and curriculum matters.
- A faculty development and promotion committee promote professional development and in-service training and reviews faculty portfolios for academic promotion.
- Franklin Cummings Tech College Senate: The purpose of the Franklin Cummings Tech College Senate is to provide a forum for faculty and staff participation in the decision-making process of the Benjamin Franklin Cummings Institute of Technology (Franklin Cummings Tech) and a Senate through which staff and faculty can function in an advisory role in the formation of educational policy at the Benjamin Franklin Cummings Institute of Technology.

Facilities

The college includes laboratory, classroom, student, and office space on its three-acre campus in the South End neighborhood of Boston. The campus centers on the Franklin Union building, an historic 1908 structure designed specifically for technical education.

For its approximately 550 students, Franklin Cummings Tech provides 12 general classrooms, 30 specialized laboratories, the Kraft Center for Student Success, an 800 seat auditorium, a student lounge, a veteran resource center, and a college store. The central place on campus is the historic, high-ceilinged lobby where students study, talk, and meet with their teachers.

Laboratories

Since effective technical education focuses on experimentation and hands-on work, Franklin Cummings Tech's facilities center on these 30 labs:

- Alternative Energy Lab
- Alternative Fuels Vehicles Lab
- Automotive Brakes Lab
- Automotive Engines Lab
- Automotive Repair Lab
- Automotive Transmissions Lab
- Automotive Electric Lab
- Automotive Diagnostics Lab
- Automotive Chassis Lab
- Building Technology Design Lab
- Computer Networking Lab
- Computer Programming Labs (3)
- Computer Diagnostics Lab
- Computer Aided Design (CAD) Labs (2)
- Electrical Electro-Mechanical Lab
- Electrical Photovoltaic & Renewable Energy Lab
- Electrical Wiring Methods Lab
- Electrical Engineering and Electronics Labs (2)
- HVAC&R Labs (3)
- Mechanical Engineering Technology Lab
- Opticianry Labs (3)
- Physics Lab

Admissions Procedure and Criteria

Application Deadlines

Applications are reviewed on a rolling basis. The priority deadline for the Fall semester is May 1 and for the Spring semester is December 1.

Admission Requirements

Because the intensity of the studies at the Benjamin Franklin Cummings Institute of Technology varies from program to program, the level of high school preparation for admission varies accordingly.

- Applicants to the associate degree programs in Engineering technology (renewable energy technology, mechatronics technology, and advanced manufacturing and automation technology) should have completed in high school: four full-year courses in English, at least four years in mathematics through Algebra II and/or up to pre-calculus, and at least one course in science.
- Applicants to the associate degree programs in automotive, computer information technology, construction management, health information technology, and opticianry should have completed in high school: four full-year courses in English, at least three years in mathematics, and at least one course in science.
- Applicants to the certificate programs in automotive, HVAC&R technology, practical electricity, CAD/SolidWorks, CNC machining, cybersecurity, network & systems support, software development, and web design/multimedia should have undertaken high school courses that reflect satisfactory development of basic English, mathematics, and science or technical skills.
- Applicants to the automotive technology program must have correctable vision and hearing, an ability to stand for long periods, the ability to lift 30 pounds, and, for continuation into the second year of the program, a valid driver's license. These requirements stem from the machinery, repair equipment, and running engines encountered in the automotive laboratories and shops.
- Applicants to the Bachelor of Science degree programs who have already earned a qualifying Associate of Science degree from Franklin Cummings Tech or another accredited college must have a minimum average of "C" in each English Composition course. Applicants should be aware of the terms of articulation agreements with other two-year colleges. Failure to meet all of the terms as outlined in the articulation agreement may result in additional coursework prior to matriculation in the Bachelor of Science programs.
- Applicants to the Bachelor of Science degree in Electrical Engineering (BSEE) must have completed in high school: four full-year courses In English, four years in mathematics through pre-calculus or statistics, three years in science, and meet all standards to complete high school requirements. Students should have a minimum of 2.5 average GPA in math to gain admission directly into the BSEE program.

How to Apply for Admission

All applicants must complete the Application for Admission at www.franklincummings.edu/apply. Official high school or secondary school records or transcripts, or official GED/HiSET scores, must be submitted before the application can be processed. High school guidance counselors or records offices may send official copies of transcripts to Franklin Cummings Tech. Students may be asked to schedule a formal interview as part of the admissions process.*

In addition, students may need to submit one letter of recommendation from a teacher, high school guidance counselor, or an employer based on the transcripts submitted. This request will be from the assigned admissions counselor. Upon enrollment, students must submit 1) a final high school or secondary school transcript that states their graduation date; and 2) immunization records as mandated by the Commonwealth of Massachusetts, along with proof of the Covid19 Vaccine.

**Interviews are not required of all students but are strongly encouraged. Students that do not possess a history of academic strength as demonstrated through their academic records may be required to have an interview with an admissions staff member prior to an admissions decision being rendered.*

Applications are processed on a rolling basis, with applicants notified of their admission status shortly after all required documents have been received. All offers of conditional admission require the applicant's successful completion of the items listed in his or her acceptance letter. Official final secondary school transcripts are required in order to complete an applicant's file and initiate the registration process.

Standardized Testing

Franklin Cummings Tech is test optional; however, applicants are strongly encouraged to take the Scholastic Aptitude Test (SAT) of the College Board or the American College Testing (ACT) Assessment.

Our CEEB code is 3394. Official test scores should be submitted to the Admissions Office if available to help support the strength of a student's application materials.

Once students are accepted to the college, admissions counselors will use their high school transcript to determine their level of proficiency in English and mathematics so that they are appropriately scheduled for classes during their first semester of enrollment.

Applicants who are native speakers of other languages must demonstrate English proficiency for entrance to all programs.

Tuition Deposit

All students who are offered admission to Franklin Cummings Tech will be required to submit a $100 tuition deposit to secure their spot in the entering class. Tuition deposits are non-refundable after May 1st.

September Admission

Applications for all programs are accepted for September enrollment.

January Admission

Applicants for January enrollment are considered for admission on a program-by-program basis as not all programs may be available for students to start during the January semester.

Transfer Students and Advanced Standing Credit

Students who have completed studies at another accredited college or university and wish to enroll at Franklin Cummings Tech must meet all entrance requirements. They must also submit an official transcript of their academic record from all colleges previously attended. Official final secondary school transcripts or equivalent are required in order to complete an applicant's file and initiate the registration process. Prospective students that have earned an associate degree from a regionally accredited college or university will only need to supply college transcripts with their application for admission. The college also awards advanced standing credit to students from select high schools where articulation agreements exist. For a complete listing of the high school advanced standing articulation agreements, visit the college's Admissions webpage.

Credit will be awarded for work completed at other accredited colleges that is equivalent in content and credit hours to Franklin Cummings Tech courses and in which at least a grade of "C" was earned. The Dean of Academic Affairs must approve all requests for advanced standing credit on recommendation of the appropriate Department Chair. Transfer students must complete at least 51% of their program's courses at Franklin Cummings Tech.

Advanced Placement and CLEP Credit

Students who have taken Advanced Placement classes and have taken the AP Exam offered through the College Board may be eligible for advanced standing credit.

Students who have successfully completed the CLEP Exam may also be eligible for college credit. In order to determine eligibility, students should submit their scores via the College Board

For a complete list of AP & CLEP Exam scores eligible for college-level credit, please visit the college's Registrar webpage.

Pre-approved credit "crosswalks" for professional or military training

Franklin Cummings Tech has already approved some external training programs for transfer credit. Examples include some union apprenticeship training programs and military training. Students who have completed these programs or expect to complete these programs should speak with their Admissions counselor, who will liaise with academic affairs staff as necessary.

Other credit for experience or prior learning

Students who believe their professional experience or training is equivalent to a course in their program should consult with the relevant Program Chair. Some credit may be granted with the approval of the Program Chair and the Registrar. Final approval rests with the Chief Academic Officer.

Placement Policy

Students admitted to Franklin Cummings Tech must be assessed to determine their skill level in English and mathematics so they can be placed into the most appropriate entry-level courses. Franklin Cummings Tech will make assessments based on the English and math grade point averages in a student's high school transcript or HiSET/GED transcript.

The Admissions Committee will closely review transcripts to ensure that each student is placed into the appropriate level courses and is set up for academic success. Academic Success advisors will meet with students to discuss where they were placed and what classes they will be taking, from their first semester to their last.

Students who have Advanced Placement (AP) credit or have earned college credits in English and/or mathematics may be exempt from taking the placement assessment. (Please see the AP policy, college credit transfer policy, and speak with an admissions counselor for more details.)

Readmission Policy

Students who have voluntarily left or been dismissed from Benjamin Franklin Cummings Institute of Technology for at least one semester and desire to reenter the program must complete the reentry form and receive the approval of the Dean of Students. The reentry form is available online, from the Admissions Office, or from the Registrar's Office. Reentry will be granted on a space-available basis and is not guaranteed. Any prior balance owed to the college must be paid in full before reentry will be considered.

If the student has been away from the college for at least three semesters, the student must apply for readmission with the admissions office and be subject to the admission and programmatic requirements of the current catalog.

PROCEDURE

Benjamin Franklin Cummings Institute of Technology will employ two different enrollment statuses to students who are readmitted to the college, depending upon the length of absence.

Reentered – This status will be employed if a student misses at least one or two complete semesters of classes. Students who withdraw mid-term and register for classes the following term will remain classified as Continuing Students.

Students who desire to reenter Benjamin Franklin Cummings Institute of Technology should be directed to the Registrar's Office to complete the readmission form which can be found on the college's Registrar webpage. The Registrar's Office will review the student's academic standing and will then register the student for courses where appropriate. If a student is not in good academic standing, the Registrar's Office will refer the student to the appropriate offices before registering the student for courses. The registrar will assign this student with the enrollment status of "reentered." Reenrolled – This status will be employed for a student who has missed three or more complete semesters of classes. Students seeking to reenroll after missing three or more complete semesters should be directed to the admissions department. Admissions will direct the student through the admissions process. During this process, the admissions counselor, in consultation with the Registrar's Office, will review the academic standing of the student before rendering an admissions decision. Upon acceptance and subsequent enrollment, the Registrar will update the student's status to Reenrolled.

Students reentering the program will continue to be counted in the cohort to which they initially entered. In the event of a question, the Registrar shall be the final determiner as to whether a student is classified as a reentered or reenrolled status.

Reenrolled – This status will be employed for a student who has missed three or more complete semesters of classes.

Students seeking to reenroll after missing three or more complete semesters should be directed to the admissions department. Admissions will direct the student through the admissions process. During this process, the admissions counselor, in consultation with the Registrar's Office, will review the academic standing of the student before rendering an admissions decision. Upon acceptance and subsequent enrollment, the Registrar will update the student's status to Reenrolled.

Students reentering the program will continue to be counted in the cohort to which they initially entered.

In the event of a question, the Registrar shall be the final determiner as to whether a student is classified as a reentered or reenrolled status.

Part-Time Students

Part-time students may enroll in courses for which they meet all prerequisites and should follow the same procedures as students seeking regular admission. Students taking fewer than 12 semester hours are considered part-time and pay tuition according to the semester hour rate. Part-time students may be eligible for federal and state financial aid programs and should apply for financial aid each year to determine eligibility.

International Applicant Information

FALL SEMESTER (SEPTEMBER)

Priority Deadline: May 1

SPRING SEMESTER (JANUARY)

Priority Deadline: October 1

REQUIREMENTS FOR ADMISSION

International applicants must submit to the Office of Admissions: secondary-school educational records or transcripts, accompanied by certified English translations as necessary. Documents should include year of secondary school graduation, courses undertaken, and grades earned in each course, as well as exam results. Applicants who have taken external examinations, such as the GCE "O" and "A" levels, or the International Baccalaureate, should submit the results in support of their application.

The agency listed below provides evaluations of educational credentials and course-by-course reports for students educated at foreign secondary schools, colleges, or universities.

Center for Educational Documentation
P.O. Box 170116
Boston, MA 02117

Telephone: (617) 338-7171
Fax: (617) 338-7101

Web: http://www.cedevaluations.com

Franklin Cummings Tech, not the agency, determines the final decision for the acceptance of transfer credit. If accepted, students must pay the required $100 USD tuition deposit before the Certificate of Eligibility for Non-immigrant Student Status, form I-20 can be issued.

APPLICATION PROCEDURE

- Complete the Franklin Cummings Tech Application for Admission.
- Pay $50 USD application fee. Students may also pay by credit card online at our website www.franklincummings.edu. This fee is non-refundable.
- Submit a transcript (with certified English translation, if needed) of secondary school records and relevant examination scores. Transfer students should also submit university transcripts and course descriptions.
- Submit evidence of English proficiency through the Test of English as a Foreign Language (TOEFL), The International English Language Testing System (IELTS) exam, or completion of English language proficiency from one of the college's certified language partner organizations. An updated list of English language partner organizations can be found on the college's Admissions webpage.
- Submit a completed Financial Declaration Form and a current bank statement (within 6 months) and letter of support from sponsor that demonstrates available funding that is greater than or equivalent to one-year of tuition and housing costs.
- International students seeking to bring dependents (defined as a spouse or child under the age of 21) must demonstrate additional funding for each dependent.

ENGLISH LANGUAGE PROFICIENCY

All applicants must demonstrate fluency in English. Completing at least one of the following may do this:

- Submitting official test scores of the Test of English as a Foreign Language (TOEFL) administered by the College Entrance Examination Board.
- Submitting official test scores of the International English Language Testing System (IELTS).
- Certificate of completion of English as a Second Language program from a recognized language institute.

FINANCIAL DOCUMENTATION

All international students are expected to have sufficient funds available to cover all academic and living expenses for the duration of their stay in the U.S. International applicants are required to provide Franklin Cummings Tech with a financial statement showing proof of ability to pay these costs for the first year of study. Franklin Cummings Tech has estimated that $40,600 USD should be sufficient to cover first-year expenses, including tuition, room and board, books, and fees.

WHEN TO APPLY

Applications and all supporting material should be submitted no later than three months prior to the intended date of enrollment to allow an appropriate amount of time for the student to obtain their visa to study in the U.S.

FORM I-20

Franklin Cummings Tech issues the Form I-20 only after payment of the $100 (U.S.) tuition deposit. All fees and deposits are non- refundable.

Financial Aid Policy for International Students

Franklin Cummings Tech does not offer financial assistance to international students. Students are advised to investigate sources of financial aid in their own countries such as family funds, government agencies, civic organizations, industry, or lending institutions.

INTERNATIONAL STUDENT ADVISING

Once enrolled, all international students are required to meet with the International Student Advisor at the beginning of each semester. Additional meetings may need to be scheduled to review new federal regulations or if the student is having academic difficulties.

Tuition Costs and Financial Aid

Tuition and Fees Schedule, Academic Year 2023-2024

TUITION

Full Time (12-21 credits)	All Certificate and Associate Degree Programs	$9,153 per semester
	All Bachelor Programs	$9,821 per semester
Part Time (1-11 credits)/ Overload (22+ Credits)	All Certificate and Associate Degree Programs	$610 per credit
	All Bachelor Programs	$665 per credit
Audit	All Courses	$250 per credit

FEES

Technology Fee	All Associate/Bachelor Degree Seeking Students	$300 per semester (max 2 times per year)
Health Insurance	Fall Starts (9+ credits)	$2,805.00 per year
	Spring Starts (9+ credits)	$1,402.50 per year
Tool Charges	First Year Automotive Tool Set Cost	$3,033 total cost
	Automotive Certificate Tool Set Cost	$2,443 total cost
	Computer Technology/Health Information Technology Freshman	$65 one time
	Electrical Tech./Practical Electricity	$550 one time
	HVAC&R Freshman	$710 one time
Technical Textbook Charge	Electrical Freshman (students will be responsible for Sophomore year textbooks)	$550 one time
	Practical Electricity (students will be responsible for 2nd and 3rd semester textbooks)	$450 one time
Technical Course Textbook	Automotive Technology	$260 one time
Membership Fee	Electrical Engineering (BS)	$50 per year
Course Charge	Textbook Fee (MA265, MA270)	$70 per course
	Textbook Fee (MA090, 095, 105, 115, 120, 130, 240, 250, 260, PH212, 213, 222, 223)	$95 per course
	Textbook Fee (BS120)	$80 per course
	Textbook Fee (BS284)	$95 per course
	English Composition 1 (EN130)	$25 per course
	Textbook Fee (BS101)	$110 per course
	Solidworks Fee (ME105, 106, 240)	$50 per course
	MasterCAM Course Fee (ME220, 225, 226)	$85 per course
	Robotics Course Fee (ME310, 315)	$150 per course

The cost for all textbooks required for each course will be available at the time of registration and will be purchased individually by the student. Benjamin Franklin Cummings Institute of Technology estimates that a student will average about $450 per semester for books.

Payment of Tuition and Fees are due approximately one month prior to the start of the semester. You may pay your balance in full, each semester, directly to Benjamin Franklin Cummings Institute of Technology or you may choose to use a payment plan available through the College. For additional information about the terms of the plan or how to enroll, contact Student Accounts at 617-588-1298.

Health Insurance can be waived for students who are already covered under a health insurance plan.

Tools and Code Books charges can only be waived by the Chair of the academic department and written approval is submitted to the student accounts office.

Through its financial aid programs, Franklin Cummings Tech has made it possible for thousands of students to afford the cost of their education. The Financial Aid section of this catalog describes the process of applying for aid.

Tuition and other fees are due before each semester begins. For the fall semester, tuition and fees are payable by August 1; for the spring semester, they are payable by December 1, May 1; for the summer semester. Payment plans are available. Please contact the Student Accounts Office for information.

Tool distribution policy

First year (AS) tool sets will be billed over 2 semesters and will be distributed at the start of the second semester. Certificate student tool sets will be distributed in the second semester, or when the student starts AT256.

Tuition Deposit

A tuition deposit of $100 is suggested to secure your spot in the incoming class. This tuition deposit is not refundable after May 1 and is applied toward the first semester tuition bill. For applicants offered admission, the deposit is payable by May 1 or within 14 days of notification of acceptance after May 1. Requests for tuition deposit refunds before May 1 should be made in writing to the Dean of Recruitment.

Health Insurance Plan (Non-refundable Fee)

Under the provisions of Chapter 23, Section 22, of the 1988 Massachusetts Health Security Act, effective September 1, 1989, each institution of higher education must require all full- and part-time students to participate in the student health insurance program or provide evidence of participation in a health insurance program with comparable coverage. For this purpose, part-time students are defined as those participating in at least 75% of the academic requirements for full-time students. The charge for the school's health insurance for 2023-2024 is $2,805. This fee will be charged to all students and will be removed only if a waiver form, showing comparable coverage, is submitted.

The waiver deadline for Fall 2023 is September 20, 2024 and for Spring 2024 enrollees the deadline is February 14, 2024. This fee covers a full year and cannot be refunded due to withdrawal. For students who already have comparable medical coverage, a waiver form is available on our website that must be completed in order to be excluded from the college's insurance plan.

Books, Supplies, and Equipment

Students supply their own textbooks and other course materials. Most of the academic courses offer digital access to textbooks via RedShelf. In addition special tool kits are also required for the Automotive Technology, Electrical Technology, Computer Technology, Health Information Technology and HVAC&R programs. See the tuition cost and financial aid section of this catalog for more detailed information on prices.

Withdrawals and Refunds

All students who wish to withdraw from the college are required to notify the college Registrar in writing of their intent to do so. The college has two recognized categories of withdrawn students, Official Withdrawals and Unofficial Withdrawals. Absence from class does not reduce a student's financial obligation nor guarantee that a final grade will not be recorded.

OFFICIAL WITHDRAWALS

Students who find it necessary to withdraw from Benjamin Franklin Cummings Institute of Technology must file an Official Withdrawal Form with the Registrar within a few days of withdrawal. The official form can be found on the web site at https://franklincummings.edu/admissions-and-aid/financialaid/withdrawals-and-reentry-to-the-college/

Upon receipt of the Official Withdrawal Form the Registrar's Office will notify the Office of Financial Aid and Student Accounts office that a student has withdrawn and is subject to a return to Title IV calculation and the institutions refund policy. The student last day of attendance will be consider the effective date of withdrawal. Students will be asked to complete Student Loan Exit counseling if they borrowed any student loans during enrollment and a final bill will be sent to the student's home address. If a student has a remaining balance it is expected that balance be paid in full within 30 days of the final bill.

UNOFFICIAL WITHDRAWALS

Students who fail to provide official notice will be monitored and withdrawn from the college after 14 days of nonattendance. Franklin Cummings Tech will make a determination on the on the 15th day after 14 consecutive days of non-attendance if a student intends to continue in classes or be withdrawn from the college as an unofficial withdrawal. The college identifies the last date of attendance as the last date of academic activity at the college.

Upon receipt of the Unofficial Withdrawal Form the Registrar's Office will notify the Office of Financial Aid and Student Accounts Office that a student has been withdrawn and is subject to a return to Title IV calculation and the institutions refund policy.

All students are refunded according to the following schedule:

WITHDRAWAL NOTICE FILED*:	AMOUNT OF REFUND
During the first week of classes	100%
During the second week of classes	80%
During the third week of classes	70%
During the fourth week of classes	60%
After the fourth week of classes	0%

For 7-week sessions the following schedule applies:

WITHDRAWAL NOTICE FILED*:	AMOUNT OF REFUND
During the first week of classes	100%
During the second week of classes	70%
During the third week of classes	30%
After the third week of classes	0%

Tool Refund Policy

Students that had to purchase their tools in the beginning of the semester through the college and wish to return tools may qualify for partial tool fee refund based on the following guidelines:

- The tools need to be returned in perfect condition, including keys to the tool box, within 20 days from their date of withdrawal recorded in the student's file.
- Tools need to be inspected by the department chair for approval of a partial refund, including condition and/or missing tools.
- The refund amount for the tools will follow the federal title IV refund policy which will calculate starting at the date when the semester begins and the official date of withdrawal recorded in the student's record.
- All tools need to be picked up by the students within one business week (5 days) of the time of withdrawal or graduation. If the student does not pick up their tools within this timeframe, students will forfeit their tools, which will become property of the college and will not be refunded

Return of Institutional Aid Policy

Institutional Aid includes all grants and scholarships awarded by Franklin Cummings Tech will be refunded under the following policy. Students that officially withdraw from the college at any point during an enrollment term will follow the federal title IV refund calculation. Franklin Cummings Tech will attempt to bring students' balance to zero or as close to zero as possible. No refund will be issued to the student if institutional aid created a credit balance on a student account. Upon receipt of the Official Withdrawal Form, Franklin Cummings Tech's Office of Financial Aid will make the required adjustments and a final bill will be mailed to the student. Payment, in full, is expected within 30 days of official date of withdrawal.

Return of Title IV Federal Student Aid Policy

The law specifies how Benjamin Franklin Cummings Institute of Technology must determine the amount of Title IV program assistance that you earn if you withdraw from school. The Title IV programs that are covered by this law are: Federal Pell Grants, Iraq and Afghanistan Service Grants, Direct Loans, Direct PLUS Loans, and Federal Supplemental Educational Opportunity Grants (FSEOGs).

Though your aid is posted to your account at the start of each period, you earn the funds as you complete the period. If you withdraw during your payment period, the amount of Title IV program assistance that you have earned up to that point is determined by a specific formula. If you received (or your school or parent received on your behalf) less assistance than the amount that you earned, you may be able to receive those additional funds. If you received more assistance than you earned, the excess funds must be returned by the school and/or you. Funds are returned in the following order: Unsubsidized Direct Loan, Subsidized Direct Loan, Direct PLUS Loan, Pell Grant, and FSEOG under federal guidelines. The college will return the excess funds to the department of education within 45 days as set by federal guidelines.

The amount of assistance that you have earned is determined on a pro-rated basis. For example, if you completed 30% of your payment period, you earn 30% of the assistance you were originally scheduled to receive. Once you have completed more than 60% of the payment period, you earn all the assistance that you were scheduled to receive for that period. If you did not receive all of the funds that you earned, you may be due a post-withdrawal disbursement. If your post-withdrawal disbursement includes loan funds, your school must get your permission before it can disburse them. You may choose to decline some or all of the loan funds so that you don't incur additional debt. Your school may automatically use all or a portion of your post-withdrawal disbursement of grant funds for tuition, fees, and room and board charges (as contracted with the school). The school needs your permission to use the post-withdrawal grant disbursement for all other school charges. Students and Parents will be notified in writing of their eligibly and must respond with 45 days in order to have the post withdrawal disbursement credited to the student account. If you do not give your permission the college will not disburse any additional funding. However, it may be in your best interest to allow the school to disburse the funds to reduce your unpaid balances at the school.

There are some Title IV funds that you were scheduled to receive that cannot be disbursed to you once you withdraw because of other eligibility requirements. For example, if you are a first-time, first-year undergraduate student and you have not completed the first 30 days of your program before you withdraw, you will not receive any Direct Loan funds that you would have received had you remained enrolled past the 30th day.

If you receive (or your school or parent receive on your behalf) excess Title IV program funds that must be returned, your school must return a portion of the excess equal to the lesser of:

1 Your institutional charges multiplied by the unearned percentage of your funds, or

2 The entire amount of excess funds.

The school must return this amount even if it didn't keep this amount of your Title IV program funds. If your school is not required to return all of the excess funds, you must return the remaining amount.

Any loan funds that you must return, you (or your parent for a Direct PLUS Loan) repay in accordance with the terms of the promissory note. That is, you make scheduled payments to the holder of the loan over a period of time.

Any amount of unearned grant funds that you must return is called an overpayment. The maximum amount of a grant overpayment that you must repay is half of the grant funds you received or were scheduled to receive. You do not have to repay a grant overpayment if the original amount of the overpayment is $50 or less. You must make arrangements with your school or the Department of Education to return the unearned grant funds.

The requirements for Title IV program funds when you withdraw are separate from any refund policy that your school may have. Therefore, you may still owe funds to the school to cover unpaid institutional charges. Your school may also charge you for any Title IV program funds that the school was required to return. If you don't already know your school's refund policy, you should ask your school for a copy. Your school can also provide you with the requirements and procedures for officially withdrawing from school.

If you have questions about your Title IV program funds, you can call the Office of Financial Aid at 617-588-1368. TTY users may call 1-800-730-8913. Information is also available on Student Financial Services on the web at https://franklincummings.edu/admissions-and-aid/financialaid/making-college-affordable/

Payment of Fees

Students with delinquent accounts will be prohibited from attending class until the matter is cleared through the Student Accounts Office.

Graduation regalia will be withheld from any student with a balance exceeding $200. Diplomas, transcripts, and grade reports will not be accessible until the entire balance has been paid.

Payment Plans

Various payment plan options are available. Students should contact the Student Accounts Office for information by calling 617-588-1298.

Address Change

Students are required to report all address changes to the Registrar's Office. Failure to do this will prevent important material, such as grade reports,registration forms, or important tax documentation from reaching the students.

Financial Aid

A Franklin Cummings Tech education is one of the most important investments you will ever make. We realize that financing this investment is a primary concern for you and your family. Here we show you how the Franklin Cummings Tech experience can be affordable for any family.

Franklin Cummings Tech offers financial aid to eligible students to assist with financing your education. In order to be considered for

need-based financial aid, a Free Application for Federal Student Aid (FAFSA) must be submitted each academic year. Award amounts vary and depend on your demonstrated financial need. Financial Need is determined by subtracting the Expected Family Contribution (EFC), from the Institution's Cost of Attendance (COA), as determined by the Financial Aid Office.

The estimated cost of attendance for an associate's degree for the 2023/2024 academic year is:

	STUDENT CHARGES (DIRECT COSTS)	NOT CHARGED (INDIRECT COSTS)
Tuition	$18,306*	
Living Expenses		$13,500
Health Insurance	$2,805	
Books & Supplies		$1,600
Technology Fee	$600	
Transportation & Miscellaneous		$2,400
Total	**$21,711****	**$17,500**

* For Bachelor's degree programs please increase your tuition cost to $19,642.

** Certain majors have to purchase additional tools or supplies. For a full breakdown of Tools and Technical Textbook Charges please reference page seventeen (17) of this catalogue. Please note that tool pricing is subject to change based upon the pricing that the college receives from our tool vendors.

Textbooks included above are for selected major courses only. Students will be responsible for purchasing any additional textbooks or other materials required for courses.

Students who currently have the required tools needed for their major must obtain authorization from the department chair to use those tools for course work. To waive the tool fee from their student account statement, waivers must be completed by the end of the first week of the semester. The department chair will evaluate the tools' quality, appropriate safety guidelines, and in class use, during the first week of the semester. Other programs at the college may require tools and/or materials that will not be included on student account statements.

Beyond tuition, health insurance, and tools, students should account for additional expenses including books and supplies, off-campus housing expenses, transportation and any additional personal items that will aid them in their studies as they plan for their enrollment at the college. These are considered indirect costs, they are listed above. Estimates of these expenses are calculated by the financial aid office to determine a student's cost of attendance when establishing a student's financial need and, subsequently, said student's financial aid package.

About 90% of our students receive some type of financial assistance. At Franklin Cummings Tech, we combine federal, state and donor-funded scholarships to compile a financial aid package that is designed to help every family be able to financially afford a Franklin Cummings Tech education.

Note: Franklin Cummings Tech cannot guarantee that we will meet your need in full. Financial aid is contingent on the timeliness of your application, federal regulations, and the availability of funds.

Full-time students will be considered for all of the financial aid programs that Franklin Cummings Tech administers, after receipt of a valid FAFSA. Student financial aid packages may be a combination of federal and state grants, and student loans. These awards will be contingent upon demonstrated financial need and the availability of funds.

Less than full time students will be considered for financial aid based on the credits she/he is enrolled in. In order for a student to maintain federal loan eligibility a student must be enrolled at least half-time (2 academic courses).

Application Procedure

In order to apply for Federal and State financial aid, the FAFSA (Free Application for Federal Student Aid) needs to be completed. Financial aid awards are not renewed automatically. The FAFSA must be completed every academic year for financial aid consideration.

STEP 1

Create an FSA ID and Password: ***https://studentaid.gov/fsa-id/create-account/launch***

Parent/s and students must create individual FSA ID's and passwords to electronically sign the FAFSA. The FSA ID is a separate application that needs to be completed before a FAFSA is completed. Follow the instructions on the website.

STEP 2

Go to FAFSA on the Web at: ***https://studentaid.gov/h/apply-for-aid/fafsa***

Complete the application and answer all of the questions on the FAFSA. List Franklin Cummings Tech as one of the schools to receive your FAFSA by including our school code, ***002151***.

Sign the FAFSA electronically by using a Federal FSA ID and password, or by mailing the signed signature page to the federal processors(The signature page is available for printing at the end of the FAFSA application.).

STEP 3

Applicants should receive a Federal Student Aid Report (SAR) from the federal processors 3-4 days after the FAFSA has been filed. The SAR indicates the Expected Family Contribution (EFC), which is used to determine eligibility for federal and state financial aid. It also lists the information recorded on the FAFSA. We will receive your information electronically from the federal processor. If Franklin Cummings Tech is not listed, please call the federal processor at 1-800-433-3243, or use your FSA ID to make a correction at ***https://studentaid.gov/h/apply-for-aid/fafsa.***

STEP 4

Follow up with our office. We may need to request further documentation from you and/or your family.

If further information is needed, a written notification will go out to you via email. It is the student's responsibility to respond promptly to this document request within 30 business days. We are not able to continue the processing of your financial aid application if the requested documents are not provided. Failure to meet this deadline could jeopardize your ability to receive need-based aid.

STEP 5

A Financial Aid Package will be sent to the student by email once we have completed the review of your application. Students who are missing documents will not receive a award letter from the Office of Financial Aid.

In order to decline any portion of the award please contact us at financialaid@franklincummings.edu or 617-588-1368.

Types of Financial Aid

Federal Aid

The Federal Pell Grant* provides awards ranging from $600 to $6,895 per academic year for exceptionally needy applicants enrolled between 6 – 12+ credits. The Pell Grant is funded by the Federal Government and is determined based on the information provided on the FAFSA and enrollment status provided. Students have a Pell Grant life-time eligibility limit of 12 semesters or the equivalent.

The Federal Supplemental Educational Opportunity Grant (SEOG)* provides awards ranging from $100-$2,500 and is awarded to students who qualify for the Federal Pell Grant. SEOG is funded by the federal government and will be awarded on a first-come, first-served basis and is subject to the availability of funds.

The Federal Work Study program is sponsored by the federal government and provides jobs for undergraduate students that demonstrate financial need. Students are responsible for finding a qualifying job, and, as they work, they will complete time sheets and will receive a pay check for the number of hours worked. Most students work between 5 and 15 hours per week, and their earnings are intended to cover educationally related expenses. Unlike other financial aid or scholarship awards, work study does not reduce your tuition bill; students will receive a pay check. Work study awards do not require repayment.

** Due to changes in Federal Regulations every July 1st, the Pell Grant and/or SEOG amounts and/or eligibility criteria are subject to change.*

Massachusetts State Aid

State grants are based on financial need and may be offered to eligible students. The Department of Education in each state determines a student's eligibility for these awards. Many states have application deadlines, which can be found at the FAFSA web site. The State of Massachusetts awards grants to eligible students who meet residency and financial criteria. Students must also have a valid FAFSA on file by May 1 of each year. These grants range in amounts from $600 to $2,800. The level of funding is contingent upon fund availability and is subject to change by the State of Massachusetts. Mass Grant has a lifetime eligibility limit of 4 academic years. Students must be enrolled in no less than 12 credits each semester to have their MASS Grant certified and disbursed to the college.

Franklin Cummings Tech also has limited part-time Mass Grant awards to students who are enrolled in majors that are not full time. The awards range from $500 to $1,000 for the academic year. Funds are limited and awarded on a first come first serve basis.

The Massachusetts Gilbert Grant is awarded to full-time students who generally meet the criteria of the Massachusetts State Grant. Award amounts range from $200 to $2,500 per academic year. The Gilbert Grant is contingent upon fund availability.

Loans

There are many loan options available to help finance a Franklin Cummings Tech education.

Direct Subsidized Loans are available to undergraduate students with financial need. The U.S. Department of Education pays the interest on a Direct Subsidized Loan until 6 months after you leave school.

Direct Unsubsidized Loans are available to undergraduates; there is no requirement to demonstrate financial need. You are responsible for paying the interest on a Direct Unsubsidized Loan during all periods. If you choose not to pay the interest while you are in school and during grace periods and deferment or forbearance periods, your interest will accrue and be capitalized.

Academic Status	Dependent Student	Independent
Freshman	$5,500	$9,500
Sophomore	$6,500	$10,500
Junior	$7,500	$12,500
Senior	$7,500	$12,500

There are two types of Loans: subsidized and unsubsidized. The subsidized loan program requires that the student demonstrate financial need. The advantage of the subsidized loan is that the government pays the interest on the loan while the student is enrolled at least half-time and during the six month grace period. Interest subsidy during the six month grace period is eliminated for loans made after July 1, 2022. This means interest accrued during those six months will be payable by the student. For the 2023-2024 academic year, a new borrower, on or after July 1, 2023, becomes ineligible to receive additional Direct Subsidized loans if the period during which the student has received such loans exceeds 150% of the published length of the student's educational program. The student also becomes

responsible for accruing interest during all periods as of the date the student exceeds the 150% limit.

Under the unsubsidized program, students can borrow even if they have no demonstrated need; however, the interest that accrues during enrollment is the student's responsibility. While in school, interest only payments may be made, but are not required. If interest is not paid while in school, the interest is capitalized (added to the original loan amount) once repayment begins. When a student graduates or withdraws from school, the loan goes into a six month repayment grace period. The average student loan debt for our students upon graduation is $12,000. Students are required to complete Exit Loan Counseling upon leaving the college or dropping below half-time enrollment.

Parent Loans

The parent loan program described below allows creditworthy parents to borrow up to the entire cost of attendance, less any awarded financial aid. The applicant must meet eligibility requirements outlined in the application materials. Unlike student loans, repayment on parent loans begins 60 days after the final disbursement of loan funds to the school for that academic year. Parents may request a deferment from their lender while the student is enrolled in school at least half time.

Federal Direct PLUS Loan: The Federal Direct Parent Loan for Undergraduate Students (PLUS) allows parents to borrow on behalf of their dependent students. Eligibility for this loan is not based on financial need but does require a credit check. Parents may borrow up to the cost of attendance minus any financial aid.

The loan has a fixed interest rate of 7.54%. There is a maximum repayment period of 10 years, with a minimum monthly payment of $50. An origination fee not to exceed 4.228% is subtracted from the requested loan amount. In the case that a parent is not approved for a Plus loan, the student may be eligible for an additional Unsubsidized Stafford Loan.

Alternative Student Loans

Many families supplement their college financing plan with private educational loans. Private loans are available from a variety of sources and provide additional funding when the other types of aid do not cover costs. These loans are not guaranteed by the federal government but by private financial institutions. Interest rates on these loans are typically higher than federal loans but lower than personal loans. Student borrowers will need a creditworthy co-signer to borrow an alternative loan. For more information about these loans, please contact the Office of Financial Aid at 617-588-1368 or via email financialaid@franklincummings.edu

PRIVATE SOURCES

Applicants are urged to seek additional aid from their own community. Many towns and cities have civic organizations, businesses or religious organizations, which may offer scholarships on the basis of need or academic merit. Labor unions and corporations are often good sources of scholarship assistance to children of employees. Applicants should consult their high school guidance counselors or local libraries for additional information. An excellent source for information on financial aid is the Higher Education Information Center at the Boston Public Library at Copley Square.

VETERANS' BENEFITS AND MASSACHUSETTS REHAB

Other sources of student aid are veterans benefits for veterans, widows of veterans, and children of deceased or disabled veterans. Students with certain physical or emotional disabilities may seek aid from the State Rehabilitation Commission in their area.

Those who qualify for benefits under any Veteran Bill or Massachusetts Rehab must contact the Registrar's Office at the beginning of the school year concerning the processing of the necessary forms. Students are asked to provide a certificate of eligibility from the VA Administration for processing. Forms should be filed as soon as possible after being accepted to Franklin Cummings Tech.

Any student who is receiving either Ch. 31 or Ch. 33 VA benefits will not be subject to the following while waiting for VA payments: being held from registering for courses, being assessed a late penalty fee, required to obtain alternative or additional sources of funding or denied any additional information needed for certification. All students using VA benefits should speak to the on campus certifying official in the Registrar's Office, if they have any questions or need additional assistance.

MASTER PROMISSORY NOTE

In order for students to borrow from the Direct Stafford Loan program, students must file a FAFSA form, complete a Master Promissory Note and successfully complete loan entrance counseling. To be eligible for them the student needs to be enrolled at least half time. Direct Stafford Loans have a fixed interest rate and minimal origination fee. For 2023-2024 academic year interest rates and fees please visit our website. The annual limits that a student can borrow are listed below.

ENTRANCE COUNSELING

All students taking out Direct Subsidized Loans or Direct Unsubsidized Loans are required to complete entrance counseling sessions at https://studentaid.gov/entrance-counseling/. A student will use the FSA ID and password to access the system. Borrowers will learn topics including what a Direct loan is, how the loan process works, about how to manage educational expenses, and other financial resources to consider to help pay for college.

EXIT COUNSELING

Exit counseling is similar to the entrance counseling you received when you first completed your master promissory note. Students will use the FSA ID and password to access the system. This learning opportunity provides information about your rights and responsibilities as a borrower, including information about various repayment plans and deferment or forbearance options that may be available to you if you are unable to make a payment https://studentaid.gov/exit-counseling/

Deferment You can receive a deferment for certain defined periods. A deferment is a temporary suspension of loan payments for specific situations such as re-enrollment in school, unemployment, or economic hardship. You don't have to pay interest on the loan during deferment if you have a Federal Direct Subsidized Stafford Loan. If you have a Federal Direct Unsubsidized Stafford Loan, you're responsible for the interest during deferment. If you don't pay the interest as it accrues (accumulates), it will be capitalized (added to the loan principal), and the amount you have to pay in the future will be higher. You have to apply for a deferment to your loan servicer (the organization that handles your loan), and you must continue to make payments until you've been notified your deferment has been granted.

Otherwise, you could become delinquent or go into default.

Forbearance Forbearance is a temporary postponement or reduction of payments for a period of time because you are experiencing financial difficulty. You can receive forbearance if you're not eligible for a deferment.

Unlike deferment, whether your loans are Subsidized or Unsubsidized, interest accrues, and you're responsible for repaying it. Your loan holder can grant forbearance in intervals of up to 12 months at a time for up to 3 years. You have to apply to your loan servicer for forbearance, and you must continue to make payments until you've been notified your forbearance has been granted. For more information about Federal Direct Student Loans, contact the U.S. Department of Education's Direct Loan Customer Service Department at 800-848-0979 or:

Direct Loan Servicing Center, Borrower Services Department
PO Box 5609
Greenville, TX 75403-5609

Student Services

The Division of Student Services is led by the Dean of Students and is made up of Advising and Student Success,

Career Services, Disability Support Services, Online Library Services, Student Conduct, Student Life, and Student Wellness and Support. The department coordinates services and activities for students outside of the classroom, including academic support, wellness and basic need resources, and campus events. The department is dedicated to the holistic support of students through efforts that enhance academic, social and personal growth.

Kraft Center for Student Success

The Kraft Center for Student Success purpose of the Student Services department is to provides Access and Support. At Franklin Cummings Tech our success team provides holistic coaching to help students achieve economic mobility through college credentials and transformative career pathways. We believe authentic student-centered support

empowers students to thrive inside and outside of the classroom. The Franklin Cummings Tech student experience is life-changing.

Authentic

Coaching

Community

Empowers

Student

Success

The Office of Student Learning and Academic Success can help students with academic success skills, such as organization, time management, and test preparation. The Director of Learning is available to meet with students who have additional learning needs and/or want to request accommodations.

Disability Support Services

Benjamin Franklin Cummings Institute of Technology is dedicated to extending all available services and support systems to everyone, without regard to race, color, national origin, religion, sex, age, disability, sexual orientation, veteran or disabled veteran status. Toward the goal of providing an equal and unbiased education, the college is prepared to take every possible step to allow students access to its services and to provide the broadest possible opportunity for participation at Franklin Cummings Tech.

Students with disabilities who may want accommodations should submit documentation to the Director of Learning in the Office of Student Learning and Academic Success as early as possible prior to their first semester at the college.

All information regarding disabilities is treated confidentially.

For reasonable and timely accommodations, accepted students with documented disabilities are encouraged to follow these steps prior to enrolling at the college:

1. Submit clinical documentation that contains specific recommendations to the Office of Student Learning and Academic Success. It is most helpful if a licensed psychologist or educational specialist has completed the evaluation within the last three years. Individual Education Plans or notes from special education teachers or tutors can be helpful forms of documentation only if they include disability diagnosis and specific recommendations for accommodations. If updated testing or evaluation is necessary, it is the student's responsibility to make those arrangements.
2. Schedule an appointment to meet with the Director of Learning to discuss challenges associated with their disabilities and the services provided at Franklin Cummings Tech, and to determine what, if any, services the student wants or needs. If it is determined that accommodations are needed, the student, along with the Director of Learning, completes a confidential accommodation request form describing the accommodations needed.
3. Students are encouraged to contact instructors to let them know about the disability and the types of accommodations required and present the accommodation request form during the first week of classes. The Director of Learning, the student and the instructor sign the accommodation request; the student and instructor each receive an electronic copy and the original request form will be kept on file in the Office of Student Learning and Academic Success.

When requesting extended time for test taking, completing papers or take-home assignments, students should remind instructors at least two weeks prior to the due date. The instructors need sufficient time to make alternative arrangements.

Advising and Student Success

The Office of Advising and Student Success provides general information on advising, registration, referral resources for students with documented disabilities, career services, and coordinates college wide academic success initiatives including tutoring and workshops related to time management and study skills.

Each student is assigned a success coach who serves as their advisor. Advisors maintain close contact with students to support their success and encourage several meetings between advisor and advisee each semester.

Advisors offer student support through assessment of strengths and challenges, review of academic progress, help with registration for future semesters, and suggestions for career preparation and success. Students who are struggling academically are encouraged to seek help by meeting with their advisor and asking for assistance through the various academic support services.

Student Leadership

With a commitment to leadership and holistic student development, the office strives to engage students in a formative and social environment that complements students' academic experience while preparing them for leadership within their careers. Through a commitment to leadership, team work, and civic engagement, the college looks to foster the development of skills that our students can utilize long after graduation.

Online Library Services

Franklin Cummings Tech offers online access to collections, services and programming that meet the needs of the college's educational programs and facilitates effective use of information and acquisition of information literacy skills for all Franklin Cummings Tech students, faculty and staff, regardless of where they are physically located or the modality by which they take their courses. The online library collection includes over 100,000 eBooks, 20 online databases with access to full-text magazines, newspapers, and other resources. The online library is accessed by logging into Franklin Cummings Tech's Canvas portal and selecting the "Online Library" from the navigational menu or on Franklin Cummings Tech's website at www.franklincummings.edu/library. Databases are both privately owned and available through Franklin Cummings Tech's membership in the Massachusetts Library System, a state supported collaborative that fosters cooperation, communication, innovation and sharing among libraries of all types. Databases include: Ebsco's Academic eBook Collection and OmniFile Full-Text Select, Infobase Facts on File's Issues & Controversies and Today's Science, Gale's Academic Onefile, Business, Diversity Studies, Economics & Theory, Environmental Studies, General OneFile, Global Issues In Context , Health & Medicine, New York Times, Onefile Psychology, Religion & Philosophy, Vocations & Careers, Opposing Viewpoints in Context, Science in Context, Proquest's Boston Globe, Taylor & Francis' Sustainable Development Online.

Ask-A-Librarian is available for students to receive reference help from Franklin Cummings Tech's accredited librarian, and 24/7 access to accredited librarians is available via TutorMe. Through its partnership with the Boston Public Library students are provided a BPL library card during the first few weeks of classes and are eligible to use the resources and facilities at the BPL central library and its branches.

Career Services

Career Services has an important mission in our work with students and employers. We provide students and recent graduates with the tools necessary to start and advance in their careers.

Coaches coordinate student internship placements, promotes employment opportunities, and helps students prepare for their post-graduation career and/or continuing education plans. Career services support is provided to students through individualized appointments as well as small workshops. Additionally, staff members run both Career Success Seminars and Workshops during students' final year at the college. These semester-based seminars and mini-workshop series cover career-readiness topics with a goal of preparing students with the tools necessary to seek, secure, and maintain employment in their field of study post-graduation.

Career Services routinely invites employers to recruit on campus. Throughout the year, many companies visit our campus, virtually or in-person, to meet with students, hosting Lunch & Learns to build awareness about opportunities within their company. The department hosts annual fall and spring recruitment events to promote awareness among students about prospective employers and help connect students to industry recruiters seeking to hire future Franklin Cummings Tech graduates for internship and employment opportunities.

SK200/SK400 – CAREER SUCCESS SEMINAR:

The Career Success Seminar is designed to provide structured time to prepare for your post-graduation plans. This seminar will provide you with guidance on how to conduct a successful job search while refining the skills needed to be a successful college graduate. The seminar will include individualized guidance for personal career goals, group workshop activities, and guest speakers from industry. You can expect to review topics such as resume writing, job search tools and techniques, networking, professionalism in the workplace, and interviewing skills.

Wellness and Support Services

At Franklin Cummings Tech, we know that outside circumstances can affect students' academic performance. In an effort to support students, we provide one-on-one meetings to help identify challenges and devise a plan for success that can include referrals to on-campus and community resources. Common reasons students seek support include basic need insecurity (food, housing, etc.), transportation challenges, mental health/wellness concerns, and more. Students experiencing challenges in their life outside of Franklin Cummings Tech are encouraged to reach out to a Success Coach, Dean of Students or directly to the Office of Student Wellness and Support. Franklin Cummings Tech places high priority on students' personal and professional growth. We're here to help you succeed!

New Student Orientation

Your first steps at Franklin Cummings Tech will be at New Student Orientation, where you will meet classmates, the Student Success team and other important members of the Franklin Cummings Tech community. You will have the opportunity to attend Financial Literacy and Career Services workshops, learn about the support services available to you at Franklin Cummings Tech and gain tips on how to be successful.

Student Code of Conduct

Benjamin Franklin Cummings Institute of Technology (Franklin Cummings Tech) has a rich tradition in which all members of the community teach and learn in an environment conducive to intellectual and moral development. All members of the Franklin Cummings Tech community must take responsibility for their actions and be willing to accept the consequences of their conduct.

The college has a set of regulations, not meant to limit a student's freedom, but to ensure the well-being and the rights of all community members. Students are required to conduct themselves in a manner reflecting favorably on the college. Failure to comply with student regulations will lead to disciplinary action and may lead to separation from the college.

INTERPRETATION OF REGULATIONS

The purpose of publishing the conduct policy is to give students general notice of prohibited behavior. This code is not written with the specificity of a criminal statute.

INHERENT AUTHORITY

The college reserves the right to take necessary and appropriate action to protect the safety and well-being of the campus community. Such action may include pursuing conduct action for any violation of state or federal law, on or off-campus, or any behavior that affects the college's educational interests.

REPORTING ACTS OF MISCONDUCT

Any student, faculty, or staff member may report actions and behaviors that affect the well-being and the rights of all community members. To ensure a safe and comfortable learning and working environment for all, the college supports a see-something, say-something philosophy, without fear of retaliation. Students, or faculty and staff should report any incidents or concerns to Franklin Cummings Tech Security (security@franklincummingstech.edu) at 617-588-1355, or to the Dean of Students.

An official incident report form is available on the college's student conduct website.

DISCIPLINARY ACTION WHILE CRIMINAL CHARGES ARE PENDING

Students may be accountable both to civil authorities and to the college for acts that constitute violations of law and of this code. Disciplinary action at the college will normally proceed during the pendency of criminal proceedings, and will not be subject to challenge on the ground that criminal charges involving the same incident have been dismissed or reduced.

INTERIM SUSPENSION

The Dean of Students (or designee) may suspend a student from the college for an interim period pending disciplinary or criminal proceedings, or medical evaluation.

A. The Dean of Academic Affairs, along with the faculty of the suspended student, will be informed regarding an interim removal of a student from class during a disciplinary investigation.
B. The interim suspension shall become immediately effective without prior notice whenever there is evidence that the continued presence of the student at the college poses a substantial and immediate threat to themselves or to others, or to the stability and continuance of normal college functions.
C. A student suspended on an interim basis shall be given a prompt opportunity to appear personally before a conduct hearing officer in order to resolve the incident.

STANDARDS OF CLASSROOM BEHAVIOR

The primary responsibility for managing the classroom environment rests with the faculty. Students who engage in any prohibited or unlawful acts that result in disruption of a class may be directed by the faculty member to leave the class for the remainder of the class period. Longer suspensions from a class, or dismissal on conduct behavior grounds, must be consulted with the Dean of Students, and the Dean of Academic Affairs.

ZERO TOLERANCE

The college supports a zero-tolerance policy against any violent action or threat of violent action toward a student, faculty, staff member, or to the institution as a whole. Students are expected to engage in appropriate conversations and use appropriate language at all times. Interpretation of language in regard to threats of violence will be at the discretion of the Dean of Students or designated professional staff members.

It is a student's responsibility to be familiar with the full list of prohibited conduct and the student conduct process, which are available in the Student Handbook as well as on the Franklin Cummings Tech Student Conduct website.

Student Rights and Responsibilities

Alcohol and Drug Policy

The college supports a zero-tolerance policy for the use, possession or intent to distribute alcohol or drugs on the Franklin Cummings Tech The college supports a zero tolerance policy for the use, possession or intent to distribute alcohol or drugs on the Franklin Cummings Tech campus. These offenses are serious in nature and will result in sanctions that may include suspension and/or expulsion from the college.

Regardless of age, there will be no use, possession or distribution of alcoholic beverages on campus. Persons 21 years or older will have the responsibility of conducting themselves in a professional manner at all times. While the college does not have jurisdiction outside of college property, any student that appears intoxicated upon entering campus will be in violation and subject to sanctions.

Knowingly being in the presence of someone using, possessing or having the intent to distribute alcohol or drugs is prohibited. Although Massachusetts state law permits the use of medical marijuana, i.e., use by persons possessing lawfully issued medical marijuana cards; and recreational marijuana for those 21 years or older, universities are still subject to the Drug-Free Workplace Act of 1988 and the Drug-Free Schools and Communities Act Amendment of 1989 which prohibits marijuana use, possession, and/or cultivation at educational institutions and on the premises of other recipients of federal funds.

Please refer to the Student Code of Conduct for specific violations of the Alcohol and Drug policies. For information regarding support with alcohol or drug use please visit the college website.

Bias-related Violence, Harassment, or Intimidation Policy

It is the goal of Benjamin Franklin Cummings Institute of Technology to maintain an environment free of violence, intimidation and harassment. Bias-related behavior based on race, religion, gender, age, ethnicity, national origin, physical appearance, disability or sexual orientation assaults the dignity and worth of the individual and will not be tolerated. Indeed, victimization will be actively opposed.

We expect that all members of this community will treat each other with dignity and respect, and that all members of the community will assume the responsibility of appropriately confronting acts of bias-related violence, intimidation and harassment which may occur. This policy statement identifies a non-exhaustive list of examples of behavior that are unacceptable and outlines the procedures for handling violations.

DEFINITION

Bias-related violence, intimidation and harassment is defined as verbal, written or physical conduct which is based on race, religion, gender, age, ethnicity, national origin, physical appearance, disability or sexual orientation. In addition, such conduct inevitably has the effect of unreasonably interfering with an individual's academic, co-curricular, social or work-related participation in the college community. Bias-related violence, intimidation and harassment exists, for example, when:

1. Behavior is intended to intimidate, insult or stigmatize an individual or group;
2. Use is made of provocative words or nonverbal symbols which, by virtue of their form, are commonly understood to convey direct and visceral hatred or contempt for human beings; or
3. An act of violence is committed in connection with a bias.

Nothing in this definition should be construed as an abrogation of freedom of expression. However, protected freedom of expression ends when prohibited bias-related violence, intimidation or harassment begins.

Campus Tobacco and Smoking Policy

Benjamin Franklin Cummings Institute of Technology supports findings from the Surgeon General that tobacco use in any form, active or passive, is a significant health hazard. As a result, Franklin Cummings Tech institutes a Campus Tobacco and Smoking Policy to support a safe and healthy learning and working environment.

For the purpose of this policy, the college defines 'tobacco' to include any lighted cigarette (tobacco, clove), cigars,

pipes, hookah, or any other smoking products including e-cigarettes and vapor cigarette devices, and any smokeless, spit or spitless, dissolvable, or inhaled tobacco products, including but not limited to dip, chew, or snuff, in any form. The policy applies to all students, employees, and visitors, with no exceptions. Smoking is allowed only in the designated area at Franklin Cummings Tech (picnic area on the corner of Appleton and Tremont Street), where signage is posted, and never inside the facility. In addition, to lessen the effects of second-hand smoke, individuals smoking outside of college buildings are prohibited from smoking within 25 feet from exterior entrances, the plaza, operable windows or outdoor air-intakes, regardless if the smoking is on or off the college campus.

Fire Safety Policy

In case of fire in the building, the nearest college fire alarm box will be sounded immediately and Campus Safety will be notified as to the location of the fire.

Fire alarm boxes are located throughout the college campus. Upon hearing the alarm, faculty, staff, and students are required to immediately exit the building. Once outside the building, students, faculty, and staff should move as far away from the building as possible, safely crossing Berkeley, Appleton, or Tremont streets, until given the all-clear to return to the building.

Unauthorized re-entry into a building during an evacuation is not permitted. Violators of this policy are subject to disciplinary action.

Alarm Systems: Smoke detectors and sprinkler systems must not be covered or blocked. Tampering with any component of the smoke detection system or sprinkler system is prohibited. Nothing may be attached to wiring, smoke detectors, and/or sprinkler system components. Violators will be charged for repair and/or replacement of any detection device with possible disciplinary action.

Evacuation: College officials reserve the right to evacuate any building or facility for emergency reasons. Noncompliance or failure to cooperate with faculty and staff during an emergency, real or drill, will result in disciplinary action.

Fire Doors: Fire doors must not be propped open or disabled.

Hazing Policy

THE HAZING ACT, MASSACHUSETTS GENERAL LAWS, CHAPTER 269, SECTIONS 17 THROUGH 19

This is a true copy of sections 17, 18, and 19 of the Hazing Act to be provided to each Franklin Cummings Tech student in accordance with the law.

Section 17. Whoever is a principal organizer or participant in the crime of hazing, as defined herein, shall be punished by a fine of not more than three thousand dollars or by imprisonment in a house of correction for not more than one year, or both such fine and imprisonment.

The term "hazing" as used in this section and in sections eighteen and nineteen, shall mean any conduct or method of initiation into any student organization, whether on public or private property, which wilfully or recklessly endangers the physical or mental health of any student or other person. Such conduct shall include whipping, beating, branding, forced calisthenics, exposure to the weather, forced consumption of any food, liquor, beverage, drug or other substance, or any other brutal treatment or forced physical activity which is likely to adversely affect the physical health or safety of any such student or other person, or which subjects such student or other person to extreme mental stress, including extended deprivation of sleep or rest or extended isolation.

Notwithstanding any other provisions of this section to the contrary, consent shall not be available as a defense to any prosecution under this action.

Section 18. Whoever knows that another person is the victim of hazing as defined in section seventeen and is at the

scene of such crime shall, to the extent that such person can do so without danger or peril to himself or others, report such crime to an appropriate law enforcement official as soon as reasonably practicable. Whoever fails to report such crime shall be punished by a fine of not more than one thousand dollars.

Section 19. Each institution of secondary education and each public and private institution of post secondary education shall issue to every student group, student team or student organization which is part of such institution or is recognized by the institution or permitted by the institution to use its name or facilities or is known by the institution to exist as an unaffiliated student group, student team or student organization, a copy of this section and sections seventeen and eighteen; provided, however, that an institution's compliance with this section's requirements that an institution issue copies of this section and sections seventeen and eighteen to unaffiliated student groups, teams or organizations shall not constitute evidence of the institution's recognition or endorsement of said unaffiliated student groups, teams or organizations.

Each such group, team or organization shall distribute a copy of this section and sections seventeen and eighteen to each of its members, plebes, pledges or applicants for membership. It shall be the duty of each such group, team or organization, acting through its designated officer, to deliver annually, to the institution an attested acknowledgement stating that such group, team or organization has received a copy of this section and said sections seventeen and eighteen, that each of its members, plebes, pledges, or applicants has received a copy of sections seventeen and eighteen, and that such group, team or organization understands and agrees to comply with the provisions of this section and sections seventeen and eighteen.

Each institution of secondary education and each public or private institution of post secondary education shall, at least annually, before or at the start of enrollment, deliver to each person who enrolls as a full time student in such institution a copy of this section and sections seventeen and eighteen.

Each institution of secondary education and each public or private institution of post secondary education shall file, at least annually, a report with the board of higher education and in the case of secondary institutions, the board of education, certifying that such institution has complied with its responsibility to inform student groups, teams or organizations and to notify each full time student enrolled by it of the provisions of this section and sections seventeen and eighteen and also certifying that said institution has adopted a disciplinary policy with regard to the organizers and participants of hazing, and that such policy has been set forth with appropriate emphasis in the student handbook or similar means of communicating the institution's policies to its students. The board of higher education and, in the case of secondary institutions, the board of education shall promulgate regulations governing the content and frequency of such reports, and shall forthwith report to the attorney general any such institution which fails to make such report.

DISCIPLINARY POLICY WITH REGARD TO THE ORGANIZERS AND PARTICIPANTS OF HAZING

The Hazing Act requires the college to have a disciplinary policy for the organizers and participants of hazing, and to set it forth with appropriate emphasis in the student handbook or similar means of communicating the institution's policies to its students.

The college procedures concerning the initiation of conduct proceedings are contained within the Student Code of Conduct and available on the college website.

Organizing or participating in hazing shall be deemed misconduct and charges will be filed in writing to the Dean of Students. Such charges will be considered "extraordinary circumstances" and the student(s) concerned may be placed on interim suspension, effective immediately, pending further investigation of the case.

When it is determined in accordance with the Student Code of Conduct that a charged party was an organizer or participant in hazing under the meaning of the law, the sanctions recommended by the hearing board shall be limited to restitution, suspension or expulsion.

Information Technology and Computer Use Policy

This policy governs computer and network usage for faculty, staff and students at Franklin Cummings Tech. As a user of these resources, you are responsible for reading and understanding the following documented information. This documented information protects the consumers of computing resources, computing hardware and networks, and system administrators. (Contact the IT Services office if you have any questions.)

RIGHTS AND RESPONSIBILITIES

Computers and networks can provide access to resources on and off campus as well as the ability to communicate with others worldwide. Such open access is a privilege and requires that individual users act responsibly. Users must respect the rights of other users, respect the integrity of the systems and related physical resources, and observe all relevant laws, regulations, and contractual obligations. Since electronic information is volatile and easily reproduced, users must exercise care in acknowledging and respecting the work of others through strict adherence to software licensing agreements and copyright laws.

Misuse of computing, networking or information resources may result in the loss of computing and/or networking access. Additionally, misuse can be prosecuted under applicable Franklin Cummings Tech or campus policies, procedures, or collective bargaining agreements.

Illegal production of software and other intellectual property protected by U.S. copyright law is subject to civil damages and criminal punishment including fines and imprisonment.

The Benjamin Franklin Cummings Institute of Technology supports the policy of EDUCOM on Software and Intellectual Rights, which states, "Respect for intellectual labor and creativity is vital to academic discourse and enterprise. This principle applies to works of authors and publishers in all media. It encompasses respect for the right to acknowledgement, right to privacy, and the right to determine the form, manner, and terms of publication and distribution. Because electronic information is volatile and easily reproduced, respect for the work and personal expression of others is especially critical in computer environments. Violations of authorial integrity, including plagiarism, invasion of privacy, unauthorized access, and trade secrets and copyright violations may be grounds for sanctions against members of the academic community."

Other organizations operating computing and network facilities that are reachable via the Institute may have their own policies governing the use of those resources. When accessing remote resources, users are responsible for obeying both the policies set forth in this documented information and the policies of the other organizations.

NO EXPECTATION OF PRIVACY

Students have access to computers and the Internet to assist them in the educational process. Students should have no expectation of privacy in anything they create, store, send or receive using Franklin Cummings Tech's computer equipment.

The computer network is the property of Franklin Cummings Tech and may be used only for educational purposes.

WAIVER OF PRIVACY RIGHTS

Students expressly waive any right of privacy in anything they create, store, send and receive, when using Franklin Cummings Tech computer equipment or Internet access. Students consent to allow Franklin Cummings Tech personnel access to and review of all materials created, stored, sent or received by students through any Franklin Cummings Tech network or Internet connection.

MONITORING OF COMPUTER AND INTERNET USAGE

Franklin Cummings Tech has the right to monitor and log any and all aspects of its computer system including, but not limited to, monitoring Internet sites visited by students, monitoring chats and newsgroups, monitoring file downloads and all communications sent and received by students.

BLOCKING SITES WITH INAPPROPRIATE CONTENT

Franklin Cummings Tech has the right to utilize software that makes it possible to identify and block access to Internet sites containing sexually explicit or other material deemed inappropriate in this setting.

FRIVOLOUS USE

Computer resources are not unlimited. Network bandwidth and storage capacity have finite limits, and all students connected to the network have a responsibility to conserve these resources. As such, students must not deliberately perform acts that waste computer resources. These acts include, but are not limited to, sending mass mailing or chain letters, spending excessive amounts of time on the Internet, playing games, engaging in on-line chat groups, uploading or downloading large files, accessing streaming audio and/or video files, or otherwise creating unnecessary loads on network traffic associated with non-education-related uses of the Internet.

EXISTING LEGAL CONTEXT

All existing laws (federal and state) and college regulations and policies apply, including not only those laws and regulations that are specific to computers and networks, but also those that may apply generally to personal conduct and harassment.

Users do not own accounts on Franklin Cummings Tech computers, but are granted the privilege of exclusive use. Under the Electronic Communications Privacy Act of 1986 (Title 18 USC, section 2510 et seq.), users are entitled to privacy regarding information contained on these accounts. This act, however, allows system administrators or other college employees to access user files in the normal course of their employment, when necessary to protect the integrity of computer systems or the rights or property of the college. For example, system administrators may examine or make copies of files that are suspected of misuse or that have been corrupted or damaged. User files may be subject to search by law enforcement, which may be used as evidence in a court of law. In addition, student files on college computer facilities are considered "educational records" under the Family Educational Rights and Privacy Act of 1974 (Title 20 U.S.C. section 1232[g]).

VIOLATIONS

Please see the Student Code of Conduct, Prohibited Conduct section #22, a-q for a listing of all Information Technology and Computer Use violations.

ENFORCEMENT

Minor infractions of this policy, when accidental, such as consuming excessive resources or overloading computer systems, are generally resolved informally by the unit administering the accounts or network. This may be done through electronic mail or in-person discussion and education.

Repeated minor infractions or misconduct that is more serious may result in referral to the Student Conduct system, in which the student may face temporary or permanent loss of computer access privileges or the modification of those privileges. More serious violations include, but are not limited to, the unauthorized use of computer resources, attempts to steal passwords or data, unauthorized use or copying of licensed software, repeated harassment, or threatening behavior.

In addition, offenders may be referred to their sponsoring advisor, department, employer, or other appropriate college office for further disciplinary action

Adapted with permission from the University of California, Davis, Computer and Network Use Policy.

Missing Student Policy

The Benjamin Franklin Cummings Institute of Technology takes student health and safety seriously and considers it with utmost importance. The staff of Franklin Cummings Tech will make all efforts to communicate with appropriate persons in a timely manner regarding a student's health and safety. The following policy and procedure has been placed into effect to support any Franklin Cummings Tech student, who based on facts and circumstances known to the college, are determined to be missing.

The enacted policy is in accordance with Section 485 of the Higher Education Act (HEA), which states that every institution of higher education that provides on-campus housing must provide a missing student notification policy for those students residing in on-campus housing.

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REPORTING A SUSPECTED MISSING STUDENT

Anyone who suspects a student to be missing should report their concern to any Student Affairs professional. All reports made to the college will be followed up with an immediate investigation once a student has been missing for 24 hours. Depending on the circumstances presented to college officials, parents of a missing student will be notified. In the event that parental notification is necessary, the Dean of Students or designee will place the call.

A suspected missing person should be reported to any of the following staff members by calling the college's main line during standard business hours at 617-423-4630 and using the automated directory to reach:

- Dean of Students
- Director of Student Wellness and Support
- Franklin Cummings Tech Security

The following information will be collected and documented when it is reported to a staff member:

- Name and directory information of suspected missing person
- Name and relationship of person reporting the suspected missing person
- Contact information (cell phone, email, address) of the person reporting
- Date, time, location the suspected missing person was last seen
- Any known extracurricular, off-campus visits (friends, family) or work commitments of the suspected missing person
- Cell phone number of the suspected missing person

DETERMINING A MISSING STUDENT

Once a student has been reported as missing, staff members may participate in any or all of the following procedures to make contact with the suspected missing student:

- Call and text the student's cell phone (or other numbers posted in CAMS)
- Check other possible public locations (library, off-campus gym, etc)
- Contact student's faculty members
- Contact student's emergency contact
- Contact any off-campus friends
- Check any social media websites (Facebook, MySpace, Twitter, etc)

INVOLVING LOCAL LAW ENFORCEMENT AGENCIES

Once all information has been collected regarding the suspected missing student and a timely and appropriate investigation has taken place by college officials, the Dean of Students and/or designee will make contact with the Boston Police Department. Once the information is reported to the Boston Police Department, the Dean of Students will continue to act as the spokesperson to the family and concerned reporter regarding the missing student.

Student Affairs staff, and Security will assist any local law enforcement agencies with the investigation upon request by providing all necessary and appropriate information on the student and by using any of the procedures and the resources listed above to assist in the investigation that are legally permissible.

Franklin Cummings Tech Sexual Misconduct Policy

For a complete version of the Policies & Procedures relating to Sexual Misconduct please visit https://franklincummings.edu/student-life/student-conduct/title-ix/title-ix-policy/

SCOPE OF THE POLICY AND PROCEDURES

This Policy is intended to provide the Franklin Cummings Tech community with a clearly articulated set of behavioral standards, and definitions of prohibited conduct and key concepts. The Policy applies to all community members, including students, faculty, staff, affiliates, vendors, visitors, applicants for admission or employment, and independent contractors. The Policy applies regardless of a person's gender, gender identity, gender expression, sexual orientation, age, race, nationality, class status, religion, or other protected status.

This Policy applies both to on-campus and off-campus conduct if (i) the conduct was in connection with a College or College-recognized program or activity, or (ii) the conduct may have the effect of creating a hostile environment for a member of the Franklin Cummings Tech community. Section X includes a list of on-campus resources available to those affected by sexual misconduct and the extent to which such resources have reporting obligations or may maintain the confidentiality of

a report of sexual misconduct. The accompanying Procedures for Addressing Student Sexual Misconduct, describe the investigation and disciplinary process that applies when a current student at the Benjamin Franklin Cummings Institute of Technology is accused of sexual misconduct.

If a Franklin Cummings Tech faculty or staff member, or other person doing business with Franklin Cummings Tech is accused of sexual misconduct, the investigation and disciplinary processes described in The Benjamin Franklin Cummings Institute of Technology's Procedures for Addressing Sexual Misconduct Complaints against Faculty, Staff, Affiliates, and Non-Affiliates apply.

Benjamin Franklin Cummings Institute of Technology encourages any member of the Franklin Cummings Tech community who has experienced sexual assault, domestic violence, dating violence, or stalking, or knows of another member of the community who has experienced sexual assault, domestic violence, dating violence, or stalking to report the incident to the college.

Students who are uncertain of their options or simply need help should contact Student Wellness and Support at (617) 588-1302. Faculty and staff may contact the Director of Human Resources (Kendall, 2nd floor) at (617) 588-1376 for assistance.

Nothing in this Policy or any of Franklin Cummings Tech's procedures for the resolution of sexual misconduct complaints shall be construed to abridge academic freedom, principles of free speech, or Franklin Cummings Tech's educational mission.

I. NOTICE OF NON-DISCRIMINATION.

The Benjamin Franklin Cummings Institute of Technology policy prohibits discrimination on the basis of race, creed, color, religion, national origin, ancestry, sex, age, marital status, veteran status, political belief or affiliation, criminal record (applications only), CORI check results, mental or physical disability, pregnancy, retaliation, sexual harassment, sexual orientation, gender identity or expression and genetic information and any other class of individuals protected from discrimination under state and federal law This policy extends to all rights, privileges, programs, and activities, including admission, employment, financial assistance, and educational programs

Franklin Cummings Tech does not discriminate on the basis of sex in its educational, extracurricular, athletic, or other programs, or in the context of employment. Sexual misconduct, including sexual harassment as defined in this Policy, is a form of sex discrimination prohibited by Title IX of the Education Amendments of 1972, a federal law that provides that:

No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.

Sex discrimination is also prohibited under Title VII of the Civil Rights Act of 1964, Massachusetts General Laws Chapter 151B, and other applicable statutes.

COORDINATION WITH Benjamin Franklin Cummings Institute OF TECHNOLOGY'S NON-DISCRIMINATION POLICY.

The Benjamin Franklin Cummings Institute of Technology recognizes that discrimination and harassment related to a person's sex can occur in connection with misconduct related to a person's sexual orientation, gender identity, or gender expression, race, color, ethnicity, national origin, religion, age, disability, or other protected class. Targeting a person on the basis of these characteristics is also a violation of state and federal law and College policy. Under these circumstances, the College will endeavor to coordinate the investigation and resolution efforts of sexual misconduct complaints with the investigation and resolution of complaints of discrimination or harassment based on other protected classes.

II. IMPORTANT CONCEPTS AND DEFINITIONS.

A Reporting Roles
Reporting Party: The person making the allegations of sexual misconduct.
Responding Party: The person against whom a complaint of sexual misconduct has been made.
Reporting Third Party: A person who has information that sexual misconduct may have been committed by a Franklin Cummings Tech Community Member or a participant in a Franklin Cummings Tech Program and who initiates a complaint.

B Consent.
To be effective, consent must be an informed, deliberate and voluntary decision to engage in mutually acceptable sexual activity. Consent is an affirmative process. It is the responsibility of the person who wants to engage in sexual activity to make sure that they have received consent from any other person(s) involved. If an individual initiating sexual activity is not sure if they have received consent, they have an obligation to seek additional clarification. Failure to do so could violate this policy and lead to disciplinary action. Consent cannot be based on assumptions. Franklin Cummings Tech policy always requires that individuals obtain consent before engaging in sexual activity.

Consent is active not passive. Signals of consent must be part of a mutual and ongoing process, offered freely and knowingly. Consent can be given by words or actions as long as those words or actions create clear, mutually understandable permission regarding the conditions of sexual activity. Relying solely on non-verbal communication can lead to misunderstandings and harmful consequences for all of the parties involved because this form of communication may be unclear. Individuals should be able to clearly articulate why and how they knew that they had received consent and what they considered to be indications of consent before they engaged in sexual activity

Silence or absence of resistance does not imply consent. Past consent to sexual activity with another person does not imply ongoing future consent with that person or consent to that same sexual activity with another person. Consent can be withdrawn at any time before or during sexual activity by either party

If a person is mentally or physically incapacitated or impaired so that they cannot understand the fact, nature, or extent of the sexual situation, there is no consent; this includes impairment or incapacitation due to alcohol or drug consumption that meets this standard, or being asleep or unconscious.

Effect of drugs and alcohol on consent:

Individuals should be aware of, and carefully consider, the potential consequences of the use of alcohol or drugs. Alcohol and other drugs can lower inhibitions and create an atmosphere of confusion over whether consent is freely and affirmatively given. If there is a question about whether someone consented to sexual activity after consuming drugs or alcohol, the College will examine the issue from the perspective of a reasonable person. Specifically, the College will consider whether the responding party reasonably should have known about the impact of alcohol and other drugs on the reporting party's ability to give consent.

C Incapacitation.
Incapacitation is the inability, temporarily or permanently, to give consent, because the person is mentally and/or physically helpless due to drug or alcohol consumption, either voluntarily or involuntarily, or the person is

unconscious, asleep, or otherwise unaware that the sexual activity is occurring. Some signs of incapacitation may include, but are not limited to, lack of control over physical movements (e.g., stumbling, falling down), lack of awareness of circumstances or surroundings, the inability to speak or communicate orally, or the inability to communicate for any reason.

It is a violation of this Policy and Massachusetts law to engage in sexual activity with a person who is incapacitated, regardless of whether the person appeared to be a willing participant. It is especially important, therefore, that anyone engaging in sexual activity be aware of the other person's level of intoxication.

D Force.

The use of force to cause someone to engage in sexual activity is, by definition, non-consensual contact, and is prohibited. Force may include words, conduct, or appearance. Force includes causing another's intoxication or impairment through the use of drugs or alcohol. Under this Policy, force includes the use of any of the following:

1 Physical Force, Violence, or a Weapon.

Physical force is the use of power, violence or strength upon another person's body. An individual's use of physical force or, violence, or threat of physical force or violence to make another person participate in or perform a sexual activity they might not have otherwise agreed to, or did not want to engage in, is a violation of this Sexual Misconduct Policy

2 Threats.

A threat often occurs when someone says or implies that there will be negative consequences from failing to consent to comply with sexual activity. It is a violation of this policy if an individual uses threats to make another person participate in or perform a sexual activity that they might not have agreed to engage otherwise.

This behavior can include (but is not limited to) threats to::

Inflict harm or injury;

The presence or suggestion of a weapon;

Hurt or kill themselves or someone else;

Expose some secret or embarrassing information;

Hurt someone's reputation;

Inflict negative social consequences;

Commit another hostile action in retribution for something done or not done Threats can be implied, veiled and/or non-verbal.

3 Intimidation and Implied Threats.

Intimidation or abuse of power/authority occurs when individuals use their real or perceived authority to influence other people to submit to sexual activity. Intimidation happens through a real or perceived display of superior wealth, status or power that someone uses to make another do what they want them to do. Real or perceived power can come from things such as class, social status, a teaching position, a mentorship, membership in a team or group and/or an individual's status within a team or group. It implies a power imbalance between the parties. When an individual uses this power/authority/control to influence another to participate in or perform a sexual activity that they might not have agreed to engage in otherwise, they have used force.

4 Coercion.

Coercion is to force one to act based on fear of harm to self or others. Means of coercion may include, but are not limited to, pressure, threats, or emotional intimidation.

E Hostile Environment.

A hostile environment exists when sexual or sex-based harassment is sufficiently serious to deny or limit a student's ability to participate in or benefit from the College's programs or activities or has the effect of unreasonably interfering with an employee's work performance or altering the terms and conditions of the employee's employment. A hostile environment can be created by anyone involved in a College program or activity

(e.g., administrators, faculty members, students, and campus visitors).

In determining whether sex-based harassment has created a hostile environment, the College considers the conduct in question from both a subjective and objective perspective. It will be necessary, but not enough, that the conduct was unwelcome to the student or employee who was harassed. But the College will also need to find that a reasonable person in the student or employee's position would have perceived the conduct as undesirable or offensive in order for that conduct to create or contribute to a hostile environment.

To determine whether a hostile environment exists for a student or employee, the College will consider a variety of factors related to the severity, persistence, or pervasiveness of the sex-based harassment, including: (1) the type, frequency, and duration of the conduct; (2) the identity and relationships of persons involved; (3) the number of individuals involved; (4) the location of the conduct and the context in which it occurred; and, (5) the degree to which the conduct affected the student's education or the employee's employment.

The more severe the sex-based harassment, the less need there is to show a repetitive series of incidents to find a hostile environment. Indeed, a single instance of sexual assault may be sufficient to create a hostile environment. Likewise, a series of incidents may be sufficient even if the sex-based harassment is not particularly severe.

III PROHIBITED CONDUCT: DEFINITIONS & EXAMPLES.

"Sexual misconduct" is a broad, non-legal term that encompasses a wide range of behaviors, including but not limited to, sexual harassment, sex/gender discrimination, sexual assault, rape, acquaintance rape, stalking, and relationship violence (including dating and domestic violence). It is a violation of Franklin Cummings Tech policy as well as applicable law to commit or to attempt to commit these acts.

Sexual misconduct can occur between strangers or acquaintances, or people who know each other well, including between people who are or have been involved in an intimate or sexual relationship. It can be committed by anyone, regardless of gender or gender identity, and can occur between people of the same or different sex or gender. This Policy prohibits all forms of sexual misconduct.

A Sex and/or Gender Based Discrimination

Sexual misconduct is, in many instances, a form of sex and/or gender discrimination and sex and/or gender based harassment. However, sex and gender discrimination and harassment that is not sexual in nature is also prohibited by Franklin Cummings Tech. For instance, Franklin Cummings Tech's' Non-Discrimination Policy prohibits the unequal treatment of an individual (or group) based on sex or gender or sex/gender based harassment — even when the conduct is not sexual in nature. The Non- Discrimination Policy also prohibits sex or gender discrimination resulting from the application of a neutral policy or procedures.

For more information on sex and gender discrimination, please see Franklin Cummings Tech's Equal Opportunity Policy. Allegations of sex or gender based discrimination that are not of a sexual nature and do not arise under the Sexual Misconduct Policy are covered by the College's Non-Discrimination Policy, and associated procedures.

B Sexual Harassment.

1 Definition of Sexual Harassment

Sexual Harassment is unwelcome conduct of a sexual nature that has the effect of creating a hostile or stressful living, learning, or working environment, or whenever toleration of such conduct or rejection of it is the basis for an academic or employment decision affecting an individual. Conduct is considered "unwelcome" if the person did not request or invite it and considered the conduct to be undesirable or offensive.

Sexual harassment includes any conduct or incident that is sufficiently serious that it is likely to limit or deny a student's ability to participate in or benefit from the Colleges educational programs or a faculty or staff member's ability to work, which may include a single incident of sexual assault or other serious sexual misconduct.

C Sexual Assault (including Rape).

Sexual assault is actual or attempted sexual contact with another person without that person's consent. Sexual assault includes, but is not limited to:

a Intentional touching of another person's intimate parts without that person's consent; or

b Other intentional sexual contact with another person without that person's consent; or

c Coercing, forcing, or attempting to coerce or force a person to touch another person's intimate parts without that person's consent; or Rape, which is penetration, no matter how slight, of (1) the vagina or anus of a person by any body part of another person or by an object, or (2) the mouth of a person by a sex organ of another person, without that person's consent.

D Sexual Exploitation.
Sexual exploitation occurs when a person takes sexual advantage of another person for the benefit of anyone other than that person without that person's consent.

Examples of behavior that could rise to the level of sexual exploitation include:

a Recording images (e.g., video, photograph) or audio of another person's sexual activity, intimate body parts, or nakedness without that person's consent;

b Distributing images (e.g., video, photograph) or audio of another person's sexual activity, intimate body parts, or nakedness, if the individual distributing the images or audio knows or should have known that the person depicted in the images or audio did not consent to such disclosure and objects to such disclosure; and,

c Viewing another person's sexual activity, intimate body parts, or nakedness in a place where that person would have a reasonable expectation of privacy, without that person's consent, and for the purpose of arousing or gratifying sexual desire.

d Prostituting another person.

E Stalking.

Stalking is prohibited under this policy when the conduct involves a Franklin Cummings Tech student, staff, faculty and/or other community member regardless of sex or gender.

Under this policy, stalking is defined as persistent, unwanted or unwelcome and repeated course of conduct that would cause a reasonable person to become fearful for the person's safety or the safety of another, or suffer substantial emotional distress.

Stalking includes the concept of "cyber stalking," a particular form of stalking that may be over an electronic medium such as the internet, social networks, blogs, cell phones, texts or other similar devices. Such modes of contact may be used to pursue or harass someone when it is unsolicited, unwelcome and/or unwanted conduct from the stalker.

F Relationship (Dating and Domestic) Violence.
Under this policy, relationship violence is intentionally violent and/or controlling behavior by a person who is currently or was previously in a dating, sexual, romantic, domestic or other intimate relationship with the reporting party. This conduct is prohibited by Franklin Cummings Tech policy regardless of the sex/gender of the individuals involved. Relationship violence can also involve domestic violence committed by a person with whom the reporting party/victim/survivor shares a child and/or domicile in common.

Relationship violence is used to gain or maintain power and control over another person. Relationship violence includes actual or threatened physical injury, sexual assault or other sexual violence, economic control and psychological and emotional abuse. Relationship violence includes behaviors that intimidate, manipulate, humiliate, isolate, frighten, terrorize, coerce, threaten, blame, hurt, injure or wound someone. Relationship violence can occur in all types of romantic, intimate and/or sexual relationships (e.g. those in same sex/gender or different sex/gender relationships). Relationship violence can occur at any stage in a relationship, including after its termination.

G Retaliation.

1 Definition of Retaliation.

Retaliation is an adverse action or attempt to seek retribution against the reporting party, or any person or

group of persons involved in the investigation and/or resolution of a sexual misconduct complaint. Retaliation can be committed by any person or group of persons, not just a responding party. Retaliation may include continued abuse or violence, other forms of harassment, and slander and libel.

It is a violation of Massachusetts and federal law and a violation of this Policy to retaliate against a person for filing a complaint of sexual misconduct or for cooperating in a sexual misconduct investigation. Any person who retaliates against a person who has reported sexual misconduct, filed a sexual misconduct complaint, or participated in a sexual misconduct investigation is subject to disciplinary action up to and including expulsion or termination by the College.

IV CAMPUS AND COMMUNITY RESOURCES.

As outlined here and in the "Resources and Support" section at the end of this Policy, a variety of support and counseling resources are available to members of the Franklin Cummings Tech Community affected by sexual misconduct. Contact information for the resources described here is available in Section X.

A Emergency / Immediate Assistance.

Franklin Cummings Tech encourages all community members affected by sexual misconduct to seek immediate assistance. Doing so promptly may be important to ensure the person's physical safety or to obtain medical care or other support. It may also be necessary to preserve evidence, which can assist the College and/or law enforcement in responding effectively.

In case of an emergency or ongoing threat, please immediately contact Franklin Cummings Tech Security. The Franklin Cummings Tech Security Desk is located in the Lobby of the Union Building or you can call Security at (617) 588-1355. If security is not available, please go to a safe location and call 911. Calling 911 will put you in touch with local police.

B Privacy & Confidentiality.

The Benjamin Franklin Cummings Institute of Technology values the privacy of its students, faculty, staff, and other community members. Franklin Cummings Tech wants all community members to seek the assistance they need without fear that the information they provide will be shared more broadly than they would like. Federal and state laws, however, impose reporting obligations on certain College employees that require them to disclose information from a report of sexual misconduct with those employees responsible for responding to such a report. However, there are individuals at Franklin Cummings Tech who are not subject to these reporting requirements, with whom students can speak in complete confidence. Even when Franklin Cummings Tech employees have an obligation to report to others, which means their office is described as "non-confidential" under this Policy, they will protect and respect an individual's privacy to the greatest extent possible and share information only on a need-to-know basis.

While discretion remains important and is critical to preserving the integrity of the investigative process and the privacy of the individuals involved, the parties are not restricted from discussing or sharing information related to their complaint with others who may support them or their case (such as legal counsel and/or support persons).

C Confidential Campus Resources and Support.

Franklin Cummings Tech encourages all members of the community to report any incident of sexual misconduct. The college recognizes, however, that not every person will choose to make a formal report with Franklin Cummings Tech or with local law enforcement. For those who are not prepared to make a report or pursue a complaint, the College provides confidential services to students through our Office of Student Wellness and Support, located on the first floor of the Union Building.

Student Wellness and Support staff can explain options for obtaining additional support from Franklin Cummings Tech and off-campus resources. Reporting parties may use this resource to talk to someone about an incident of sexual misconduct in a confidential manner whether or not they decide to make an official report or to participate in the Franklin Cummings Tech informal resolution process or the criminal justice system. Conferring with this resource will not trigger an investigation by the College or law enforcement. However, this office is familiar with Franklin Cummings Tech's complaint resolution processes, can explain what to expect, and can provide support while Franklin Cummings Tech or criminal processes are pending.

D Non-Confidential Campus Resources.

In addition to the confidential resources discussed above, all members or the Franklin Cummings Tech community have access to a variety of individuals who are trained to support those affected by sexual misconduct and to coordinate with the Title IX Coordinator. While not bound by confidentiality, these resources will nevertheless maintain the privacy of a person's information within the limited circle of those involved in the Title IX investigation and resolution process.

1 Title IX Coordinators.

The Title IX Coordinator is responsible for overseeing Franklin Cummings Tech's response to Title IX reports and complaints, and identifying and addressing any patterns or systemic problems revealed by such reports and complaints. The Title IX Coordinator's contact information is in Section X.

The Deputy Title IX Coordinators are individuals who are trained to assist students and employees with complaints or concerns about sexual misconduct, and direct them to the resources they need. They report all complaints and concerns to the Title IX Coordinator, and work closely with the Title IX Coordinator in promptly responding to a person's concerns. The Deputy Coordinators can help with interim measures that a reporting party may need during the investigation of a complaint. Contact information for the Deputy Title IX Coordinators is in Section X.

E Off-Campus Resources.

Students, faculty, and staff may also access resources located in the local community. The organizations and agencies listed in Section X can provide crisis intervention services, counseling, medical attention, and legal assistance. All members of the Franklin Cummings Tech community are encouraged to utilize the resources that are the best suited to their needs, whether on or off campus. In general, off-campus resources can provide assistance to those who wish to make a report to the College, but will not notify the College without the consent of the reporting party.

V REPORTING SEXUAL MISCONDUCT.

Franklin Cummings Tech encourages all community members to report incidents of sexual misconduct as promptly as possible so that the College can respond effectively. Students may report sexual misconduct to the Dean of Students, the Title IX Coordinator, or a Deputy Title IX Coordinator, or to any non-confidential Franklin Cummings Tech staff or faculty member.

Faculty and staff may report incidents to the Deputy Title IX Coordinator in Human Resources, the Dean of Academic Affairs, or their department head. In general, when one of these offices receives a report, the College must commence an investigation. All reports of such incidents will be disclosed to the Title IX Coordinator.

Franklin Cummings Tech recognizes that students may be most comfortable disclosing sexual misconduct to a College employee they know well, such as a faculty member, staff member, or advisor. Students are welcome to speak with them, but should understand that these individuals are considered "responsible employees" of the College (other than the confidential resources identified in the Section X), and if they receive a report of sexual misconduct are required to inform the Title IX Coordinator about the incident. All college employees, including faculty, staff, and administrators, student employees who have a responsibility for student welfare, and student volunteers who have a responsibility for student welfare, are required to share with the Title IX coordinator any report of sexual misconduct they receive or of which they become aware.

A Reports to a Non-Confidential Resource: Requests for Confidentiality.

When the college has received a report of sexual misconduct, but the reporting party requests that their identity remain confidential or that the college not pursue an investigation, the college will balance this request with its responsibility to provide a safe and non-discriminatory environment for all college community members. The college will take all reasonable steps to investigate and respond to the complaint consistent with the request for confidentiality or request not to pursue an investigation. The college will seek to respect the request of the reporting party, and where it cannot do so, the college will consult with the reporting party and keep them informed about the chosen course of action.

B Interim Measures and Support.

Franklin Cummings Tech provides a range of support services for reporting parties, including interim measures. Interim measures are available to provide for the safety of the reporting party and the campus community while the College is investigating an allegation of sexual misconduct. Requests for interim measures can be made by or on behalf of the reporting party to the Franklin Cummings Tech Title IX Coordinator or a Deputy Title IX Coordinators. Students may also seek assistance from the Dean of Students Office. The Title IX Coordinator will work with the appropriate office(s) to ensure that any necessary interim measures are promptly provided.

Upon the receipt of a report of sexual misconduct, and until any investigation into the report has been completed, the College will provide reasonable protective measures and interim support to provide a safe educational and work environment and to prevent additional acts of sexual misconduct, even when there is no specific request for protective action.

The College may impose any measures that can be tailored to the parties involved to achieve the goals of this Policy.

An individual's failure to comply with restrictions imposed by interim measures is a violation of this Policy and a basis for disciplinary action.

Outside Franklin Cummings Tech, a reporting party may also be entitled to obtain remedies under applicable law, such as a judicial restraining order. The College can assist in contacting law enforcement or legal service organizations to learn about these remedies.

Examples of Interim Measures Include (but are not limited to):

1 Issuing a No Contact Order

2 Academic, Employment or Residence Modifications

3 Emotional Support

4 Interim Suspension

5 Administrative Leave (for employees)

C Amnesty for Students Who Report Sexual Misconduct.

Franklin Cummings Tech encourages the reporting of all concerns regarding sexual misconduct. In some instances, students may be hesitant to report sexual misconduct because they fear potential consequences for their own conduct. An individual who reports sexual misconduct, either as a student reporting party or a student third party witness, will not be subject to disciplinary action by the college for their own personal consumption of alcohol or drugs at or near the time of the incident, provided that any such violations did not and do not place the health or safety of any other person at risk.

However, the use of alcohol or drugs does not excuse sexual misconduct and a person who has been incapacitated through the use of alcohol and drugs (or by any other means) cannot give effective consent to sexual activity. The college may initiate an educational discussion or pursue other educational remedies regarding alcohol or other drugs.

VI OTHER INFORMATION RELATED TO REPORTING SEXUAL MISCONDUCT

A Time for Reporting.

Although all members of the Franklin Cummings Tech community are encouraged to report sexual misconduct immediately in order to maximize the College's ability to respond promptly and equitably, Franklin Cummings Tech does not limit the time frame for reporting. However, the College's ability to investigate and respond effectively may be reduced with the passage of time.

B Anonymous Reports and Reports from Third Parties.

Any person may make an anonymous report concerning an act of sexual misconduct. A person may report the incident without disclosing their name, identifying the responding party, or requesting any action. Depending on the level of information available about the incident and the people involved, however, the College's ability

to respond to an anonymous report may be limited. Anonymous reports may be made by submitting an Incident Report Form to the Dean of Students, the Title IX Coordinator or one of the Deputy Title IX Coordinators.

In cases in which the report was made anonymously or by a third party (such as a friend, roommate, adviser, or faculty member), this Policy will apply in the same manner as if the reporting party had made the initial report. A Title IX Coordinator or Deputy Title IX Coordinator will make every effort to meet with the reporting party to discuss available options and on-campus and off-campus resources.

C Reporting of Crime and Disciplinary Statistics.

The Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act ("Clery Act") is a federal law that requires the College to record and report certain information about campus safety, including the number of incidents of certain crimes on or near campus, some of which constitute sexual misconduct under this Policy.

The Clery Act also requires the College to issue a "timely warning" when it receives a report of certain crimes that pose a serious or continuing threat to the College community. This warning will not contain any biographical or other identifying information regarding the victim of the crime. Immediately threatening circumstances include, but are not limited to, recently reported incidents of sexual misconduct that include the use of force, a weapon, or other circumstances that represent a serious and ongoing threat to students, faculty, administrators, staff, or visitors.

D Public Awareness Events.

The College supports public awareness events that further campus-wide education and prevention efforts.

A community member's public disclosure of incidents of sexual misconduct at these events will not be considered a report to the College for the purpose of triggering an investigation of a particular incident.

In addition, the college may, from time-to-time, conduct climate surveys to gauge attitudes about sexual misconduct and awareness of campus resources. These voluntary surveys will contribute to the College's understanding of the campus climate and student safety. The disclosure of incidents of sexual misconduct in responses to survey questions will not be considered a report to the College for the purpose of triggering an investigation of a particular incident.

E Prohibition Against Retaliation.

Franklin Cummings Tech and Title IX strictly prohibit retaliation against and intimidation of any person because they reported an incident of sexual misconduct or are involved in the College's response. Franklin Cummings Tech will take strong disciplinary action in response to any retaliation or intimidation, and will pursue such discipline through the applicable student conduct policy or other disciplinary process and follow the applicable time frames within such policies or processes.

F Filing a Criminal Complaint and Coordination with Law Enforcement.

Franklin Cummings Tech encourages reporting parties to pursue criminal action for incidents of sexual misconduct that may also be crimes under Massachusetts law. If necessary, the College may notify the Boston Police Department of allegations of sexual violence. The College can also assist a reporting parties in making a criminal report and will cooperate with law enforcement agencies if a reporting party decides to pursue the criminal process to the extent permitted by law.

However, a reporting party may also choose not to pursue criminal action, and under most circumstances, the Boston Police Department will not force a reporting party to pursue criminal charges if they are not willing to do so.

VII TITLE IX REVIEW.

A Role of the Title IX Coordinator.

Jackie Cornog, Title IX Coordinator | (617) 588-1358 | jcornog@franklincummingstech.edu

Deputy Title IX Coordinator, Director of Human Resources | (617) 588-1376

The Title IX and/or Deputy Title IX Coordinators can be contacted by telephone, e-mail, or in person. They can provide information related to campus and community resources and describe the options available to address concerns related to sexual misconduct.

B Procedures for Responding to Sexual Misconduct.

The Title IX Coordinator oversees the initial response and assessment of reports of sexual misconduct through the College's sexual misconduct resolution procedures. The procedure used will be determined by the status of the responding party:

1. Complaints against student respondents will be resolved by the Procedures for Addressing Student Sexual Misconduct
2. Complaints against student responding parties will be resolved by the Procedures for Addressing Student Sexual Misconduct
3. Complaints against faculty and staff responding parties, as well as non-affiliates, will be resolved by the Procedures for Addressing Sexual Misconduct Complaints against Faculty, Staff, Affiliates, and Non-Affiliates.

Each process is guided by the same principles of fairness and respect for all parties. Resources are available for both students and employees, whether as reporting parties or responding parties, to provide guidance throughout the investigation and resolution of a sexual misconduct complaint.

VIII PREVENTION AND EDUCATION

Franklin Cummings Tech expects all community members to take reasonable actions to prevent or stop an act of sexual misconduct. Taking action may include direct intervention, calling law enforcement, or seeking assistance from a person in authority. Members of the Franklin Cummings Tech community who intervene to prevent or stop sexual misconduct will be supported by the College and protected from retaliation.

IX TRAINING

In connection with its obligations under Title IX, Franklin Cummings Tech is committed to ensuring appropriate training for its Title IX Coordinator, Deputy Title IX Coordinator, "responsible employees," and others involved in responding to, investigating, or adjudicating sexual misconduct. In addition, the college conducts yearly training on Title IX issues for Students, Faculty and Staff.

X RESOURCES AND SUPPORT.

The contact information for the resources listed here was confirmed at the time of the Policy's initial publication in June 2019. Up-to-date contact information can always be found on the College's website at https://franklincummings.edu/student-life/student-conduct/title-ix/title-ix-policy/

CONFIDENTIAL ON-CAMPUS SUPPORT, ADVOCACY AND HEALTH RESOURCES

Student Wellness & Support First Floor, Union Building (617) 588-1302

OFF-CAMPUS COUNSELING AND ADVOCACY RESOURCES

Boston Area Rape Crisis Center ("BARCC") www.barcc.org
617-492-RAPE (7273)
800-841-8371

Victim Rights Law Center ("VRLC")
www.victimrights.org/
115 Broad St., 3rd Floor (NO WALK-INS)
Boston, MA 02110 617-399-6720, x19
For legal assistance by email: legalhelp@victimrights.org

Fenway Health Violence Recovery Program
www.fenwayhealth.org/
617-267-0900 24/7

OFF-CAMPUS LAW ENFORCEMENT RESOURCES

Boston Police Department Emergency: 911

Sexual Assault Unit: (617) 343-4400

OFF-CAMPUS MEDICAL / HEALTH CARE RESOURCES

A medical provider can provide emergency and/or follow- up medical services as appropriate, and a person can discuss any related health care concerns in a confidential medical setting. The medical examination has two primary goals: (i) to diagnose and treat the full extent of any injury or physical effect (sexually transmitted infection or pregnancy) and (ii) to properly collect and preserve evidence. There is a limited window of time within which to preserve physical and other forms of evidence (usually within 96 hours of the sexual assault). Taking the step to gather evidence immediately does not commit a person to any course of action.

Boston Medical Center
725 Albany St, Boston, MA 02118
617-414-4075 Emergency Room

Note: Boston Medical Center and Beth Israel Deaconess Medical Center, along with Brigham & Women's Hospital are SANE designated hospitals that have specially trained Sexual Assault Nurse Examiners ("SANE") on call.

GOVERNMENT RESOURCES

The resources listed here may provide additional assistance for those who would like to file an external complaint of sexual misconduct or students with inquiries regarding the application of Title IX and its implementing regulations.

U.S. Department of Education, Office for Civil Rights
http://www.ed.gov/ocr
Region I – Boston Office
5 Post Office Square, 8th Floor Boston, MA 02109-3921
617-289-0111
By Email: OCR.Boston@ed.gov

U.S. Department of Justice, Office on Violence Against Women
https://www.justice.gov/ovw/protecting-students-sexual- assault
145 N Street, NE, Suite 10W.121 Washington, DC 20530
202-307-6026

U.S. Citizenship and Immigration Services
www.uscis.gov/about-us/find-uscis-office/field-offices/ massachusetts-boston-field-office
Boston Field Office
John F. Kennedy Federal Building
15 New Sudbury Street
Room E-160
Boston, MA 02203
800-375-5283

Massachusetts Commission Against Discrimination ("MCAD")
http://mass.gov/mcad
1 Ashburton Place, Sixth Floor
Boston, MA 02108
617-994-6000

Social Networking and Online Responsibility

Benjamin Franklin Cummings Institute of Technology understands the popularity and usefulness of social networking sites and supports their use by students provided that:

- No offensive or inappropriate pictures are posted;
- No offensive or inappropriate comments are posted;
- Any information placed on the website(s) does not violate college, student athlete, or the student code of conduct;
- Inappropriate photos and/or comments posted on these sites do not depict team-related or college-identifiable activities (including wearing/using team uniforms or gear inappropriately).

Students must remember that they are representatives of Benjamin Franklin Cummings Institute of Technology. Please keep the following in mind as you participate on social networking websites:

- Before participating in any online community, understand that anything posted online may be available to anyone in the world. Any text or photo placed online may become the property of the site(s) and may be completely out of your control the moment it is placed online - even if you limit access to your site.
- You should not post any information, photos or other items online that could embarrass you, your family, your student club or organization, your team, or athletics at Benjamin Franklin Cummings Institute of Technology. This includes information that may be posted by others on your page.
- Never post your home address, local address, phone number(s), birth date or other personal information. You could be a target of predators.
- Student-athletes could face discipline and even dismissal for violations of team, department, college and/or NJCAA policies.

Law enforcement agencies may monitor these websites regularly as may potential employers and internship supervisors as a way of screening applicants. In addition, many college programs and scholarship committees also search these sites to screen candidates. Franklin Cummings Tech student athletes and student leaders should be very careful when using online social networking sites and keep in mind that sanctions may be imposed, including the loss of your eligibility to participate on teams or in organizations, if these sites are used improperly or depict inappropriate, embarrassing or dangerous behaviors.

Academic Affairs

The Benjamin Franklin Cummings Institute of Technology offers a range of technical programs that lead to a variety of careers and further educational opportunities. They range from one-year certificates in automotive technology, Network and Systems Support, Software Development, and Web Design, practical electricity, three short-term stackable certificate programs (Electronics Technology Certificate, CAD with Solid works Certificate and CNC Machining Certificate) and HVAC&R to two-year academic degrees in computer technology, health information technology, industrial, and engineering technologies, to four-year degree programs in health information technology, mechanical engineering technology and electrical engineering, with a focus on the electric power industry.

All our programs provide hands-on laboratory work combined with classroom technical concepts and a strong general education component. In the online format, hands-on work is enabled through simulation software.

Academic Departments

Automotive Technology offers an associate in automotive technology, through an array of courses in engines, electricity, emissions, alternative fuels, brakes, steering, suspension, air conditioning, transmissions diagnosis, and repair. The department also offers a concentration in Electrical Vehicle Technology along with a certificate program.

Construction Management offers an associate degree with a background of technical and organizational skills that apply to construction projects from conception to completion. Students will study the skills necessary to manage resources for vertical and horizontal construction projects. Skills are acquired through hands on graphics, introduction to AutoCad, construction management, heavy construction, building materials and building systems, sustainable construction, environmental systems, construction scheduling and surveying. Laboratory classes prepare students to understand, use and implement construction contract documents. Emphasis is placed on team building and implementation of best management practices including cost, schedule, quality and safety standards. Current building standards, regulations and safety training, including OSHA 10 certification, are incorporated throughout all course work. Projects and site visits are used for practical applications of course work. The department also offers a certificate program.

Computer Information Technology offers an associate degree in computer technology that prepares students for work in a variety of roles as IT support specialists, and two certificates and associate degree focusing on Network and Systems Support, Software Development. The department also offers associate in Cybersecurity.

Health Information Technology offers an associate degree in health information technology, and a bachelor degree in health information technology that prepare students for a variety of opportunities in the healthcare industry focusing on electronic health records and other computerized health information systems. Within the Bachelor of Science in Health Information Technology program, two tracks are offered that prepare students for work in the Public Health and Data Analytics domains.

HVAC&R is a nine-month, 800-hour, full-time day or evening certificate program, designed to provide students with the knowledge and hands-on skills to become successful HVAC&R technicians. HVAC&R technicians work for heating and cooling contractors, refrigeration and air conditioning service and repair shops, schools, hospitals, office buildings, a variety of food industries, and local, state or federal government facilities.

Electrical Engineering offers a bachelor of science degree in electrical engineering, with a special emphasis on the electric power industry.

Practical Electricity offers a certificate in practical electricity, both of which provide classroom hours and hands-on training in electrical design and layout and instruction in the National Electrical Code. Successful completion of these programs fulfill the Massachusetts Board of State Examiners of Electricians academic requirements towards Journeyman Electrician licensure by providing 600 hours of classroom instruction.

Engineering Technology offers three short-term stackable certificate programs (Industrial Electronics Technology Certificate, CAD with Solidworks Certificate and CNC Machining Certificate) and four Associate of Science degree programs (Mechatronics Technology, Building Energy Management, Renewable Energy Technology and Manufacturing and Automation Engineering. The department offers two flexible and stackable pathways from Certificate to Associate of Science Degree Programs (Industrial Electronics Cert. to A. S. in Mechatronics Engineering

Technology; CNC Machining Cert. to A.S. in Manufacturing and Automation Engineering). The Renewable Energy Technology concentration prepares the students for careers in the solar energy, wind energy and energy storage industries. The Mechatronics Technology and Manufacturing Technology pathways will prepare students to be employed in the areas of Electronics engineering, Mechanical design engineering and Robotics/Automation engineering technology.Apart from offering a career-focused training curriculums in each of the concentrations, the Engineering Technology program prepares the students to build a profile that is suitable for a wide range of advanced career pathways leading to various engineering technician positions, project management positions, and technologist positions.

Opticianry provides an associate degree offering a wide range of technical courses such as Ophthalmic Design and Contact Lens theory to prepare individuals for a career as an optician.

General Education provides a range of courses in composition, communication, and the social sciences that provide general education to enable and complement the technical courses. The ***Mathematics and Science*** teaches the concepts that underlie all of the technical specialties of the college, offering mathematics courses that emphasize theory and applications, as well as classroom and laboratory physics.

Division of Professional and Continuing Studies (DPCS) at Benjamin Franklin Cummings Institute of Technology specializes in hands-on education and the learning needs of adult learners. We are committed to helping our alumni achieve their next step in educational and career goals. Our flexible class schedules in evening, weekend, and online are designed to accommodate their busy lifestyles. We work closely with our industry partners to develop specific educational programs to meet the needs of our professional students.

Academic Policies

GRADING SYSTEM

The grading system employs the five letters and corresponding values defined below:

LETTER GRADE	DESCRIPTION	GRADE WEIGHT
A	95-100	4.00
A-	90-94	3.67
B+	87-89	3.33
B	84-86	3.00
B-	80-83	2.67
C+	77-79	2.33
C	74-76	2.00
C-	70-73	1.67
D+	67-69	1.33
D	60-66	1.00
F	BELOW 60	0.00
I	INCOMPLETE	0.00
P	PASS	0.00
W	WITHDRAWN	0.00
WF	WITHDRAWN-FAILURE	0.00

Developmental Course Grading System

LETTER GRADE	DESCRIPTION	GRADE WEIGHT
AA	94-100	4.00
AB	88-93	3.50
BB	83-87	3.00
BC	78-82	2.50
CC	73-77	2.00
FF	0-72	0.00

These courses will not be factored into a Student's Cumulative GPA or count toward maximum time frame. Students may not receive financial aid for more than thirty attempted developmental credits.

CALCULATING GRADE POINT AVERAGE (GPA)

The GPA demonstrates the level of success in college studies. It is based on the earned grade (the weight of each is shown above) and the number of credit hours (see individual course descriptions for credit hour details) for each course. To calculate the GPA, multiply the earned grade weight of each course by its assigned credit hour(s). The sum of these is then divided by the sum of the total semester credit hours for the courses included in the calculation. The result is the GPA.

DISTRIBUTION OF GRADES

All midterm and final grade reports are accessed through the Canvas learning management system unless other arrangements are made.

CREDIT HOUR POLICY

Benjamin Franklin Cummings Institute of Technology follows the Carnegie Unit for credit a semester system with the fall, spring, and summer terms generally consisting of 14 weeks, which includes one week for exams. Terms that vary from that length adhere to this policy. Regardless of delivery method — traditional classroom, online, or hybrid — or length of the term, every Franklin Cummings Tech course requires the equivalent of 150 minutes of instruction per week for three credit course and a minimum of two hours of out-of-class student work, per credit hour.

The faculty are responsible for the curriculum. Credit values for courses are determined at the department level based on faculty expertise and course objectives. Faculty Academic Advisory Committee (FAAC) are charged with following the policy on credit hours in their review and approval of all courses and for validating that the expected student learning for the course meets the credit hour standard.

LABORATORY COURSES

Courses with a focus on hands on or experimental learning under the direct supervision of a faculty member require a minimum contact time of 2 hours per credit (2:1 ratio).

Dean's List

The Dean's List comprises those students who have a term GPA of 3.5 or higher, have no current grade below C, and have successfully completed a minimum of 12 credit hours during the semester.

Attendance Policy

Students of the Benjamin Franklin Cummings Institute of Technology are expected to attend all classes. Attendance is taken at each class meeting and absences become a part of students' records. The college recognizes that occasions may arise that prevent students from attending class.

If this occurs, a student should talk to the instructor as soon as possible to determine any missed work. It is important for students to understand that they are responsible for any work missed and that missed classes and/or work can seriously harm grades.

As a guide for students who wish to avoid failing grades, the college has established a fixed number of hours a student might be able to miss in a class before falling into the danger of failing for lack of attendance. These fixed hours are determined by multiplying the total credit hours for the course by two. Once a student has exceeded this maximum in any class, that student may be strongly advised to withdraw from the course. Franklin Cummings Tech will make a determination on the 15th day after 14 consecutive days of non attendance whether a student intends to continue in classes or should be withdrawn from the college. Some courses and programs may have additional consequences for missing class time. Look closely at course syllabi and other documents that will spell out these policies. For additional information regarding the college's official/unofficial withdrawal policy please refer to pages 16-17.

Add/Drop Period

After a student is pre-registered, course changes can be made through the Add/Drop period. For 14-week courses, students may add courses throughout the first week of classes, and may drop them throughout the first two weeks. As for 7-week courses, students may add courses within the first three days of classes and may drop them throughout the first week. A student must attend at least one class session of each course before the end of the add/drop period to remain on the course roster. Please refer to the Academic Calendar for specific dates. All course changes must be made through the Registrar's Office. No change will be made after this period except through the written consent of the appropriate instructor.

Incomplete Grades

The incomplete (I) grade is appropriate in cases where students have made a good faith effort to finish a course on time but have not done so due to factors out of their control. This grade is reserved for cases where the unfinished work can be clearly identified and completed within a short period of time. This agreement must be made between both the student and instructor before grades are submitted at the end of the semester. To assign the incomplete grade the instructor must send an e-mail to the Dean of Academic Affairs with a copy to the Registrar's office stating the student's name, the course name, the student's current grade in the course, and the reason for the request. Attach to the message a completion plan that meets the following semesters add/drop deadline, approved by the instructor and the student, that includes a list of work still required with a brief description of when and how it will be completed. The incomplete must be made up before the add/drop deadline of the following semester or it will be changed to an F (failure). Any request for extension beyond the add/drop period must be made in writing to the Instructor and the Dean of Academic Affairs before the end of the deadline and the Registrar should be notified if an extension is granted.

Course Withdrawal

A student may withdraw from a course through the tenth (10th) week of class and receive a grade of "W" (withdrawal) recorded on the official transcript. After the tenth (10th) week, a grade of WF will be applied.

In seven (7) week sessions, a withdrawal after the fourth (5th) week will result in a grade of WF.

Co-requisites and Pre-requisites

There are courses that provide foundational information required for successful continuation of a program.

Co-requisites are courses that must be taken at the same time as another required course. Pre-requisites are courses that must be taken before continuing on to further course work.

Transcript Policy

The Office of Registrar is pleased to offer an online transcript ordering process through National Student Clearinghouse, a nonprofit organization serving more than 3,000 academic institutions in the United States. Visit https://tsorder.studentclearinghouse.org/school/select to place and order.

Cost for online orders:

Electronic PDF: $9.25 (transcript accessible via email link and access code, sent to email recipient)

ETX/Electronic Transcript Exchange: $8.25 (transcript accessible via secure ETX FTP account for participating schools/organizations)

Mail: $8.25 (paper transcript sent by USPS regular mail)

Overnight Mail: $43.25 (paper transcript sent by overnight delivery)

Attendance prior to 1981 transcripts: $43.25

Satisfactory Academic Progress Policy

Franklin Cummings Tech monitors Satisfactory Academic Progress (SAP) to ensure the successful and timely completion of students' academic careers. SAP is measured through evaluating the credits attempted and completed as well as the term and cumulative Grade Point Average (CGPA) of each student. The U.S. Department of Education requires all students that receive financial aid make progress toward their program of study. The Registrar's Office will evaluate students at the conclusion of each semester to determine if Satisfactory Academic Progress is being made. Students who leave the college and subsequently return will be evaluated for SAP before financial aid is offered, regardless of the term in which they return to Franklin Cummings Tech.

Satisfactory Academic Progress

SAP Standards are based on both qualitative and quantitative measurements.

- Cumulative Grade Point Average (CGPA) is the qualitative measurement for SAP. Students must maintain a minimum CGPA based on the number of credits attempted as noted below.
- If a student repeats a course, the lower grade is replaced by the higher grade when calculating the CGPA. The lower grade will remain on the transcript and continue to be reflected in the term GPA. Once a credit is earned for a course, financial aid will only be available for a student to retake said course one time. Students retaking courses where credit has not been earned may be eligible for financial aid. Instances when students may need to retake a course in which they have already earned credits include the need to improve their CGPA for graduation eligibility or if there is a requisite minimum passing grade before the student can progress to the next level of course sequence in his/her program. For students who have changed major, only courses applying to the new program will be calculated in the CGPA.
- Completion Rate is one part of the quantitative measurements for SAP. Degree-seeking students with less than 40 credits attempted are required to successfully complete 50% of all attempted course work in their current degree program each semester. Degree-seeking students with 40 or more credits attempted are required to successfully complete 67% of all attempted course work in their current degree program each semester. Any course in which a student is enrolled after the regular add/drop period is considered an attempted course. A passing grade is considered to be successful completion of a course. Failure, withdrawal after the drop deadline, or an Incomplete (I) grade in a class constitutes an attempted course which is not successfully completed. Each repeated course work attempt counts towards the credits attempted. Developmental credit and transfer credit will count towards both credits attempted and credits earned. For students who have changed major, only credits attempted and earned which are applied to the new program count towards the completion rate.
- Maximum Time Frame is the second part of the quantitative measurement for SAP. Students must complete their program within 150% of the program length. This is measured in terms of credits attempted and earned. For example, a 60 credit hour degree must be completed without attempting more than 90 credits. Once a student can no longer complete their program without exceeding maximum time frame, they will be academically suspended. Transfer credits are counted in the total number of credits attempted. Developmental courses are excluded.

	Credits Attempted	Minimum CGPA	Minimum Completion Rate
Associate/Bachelor Degree	1 to 19	1.7	50%
	20 to 39	1.9	50%
	40 or more	2.0	67%
Certificate Programs	1 to 14	2.0	50%
	15 or more	2.0	67%

NOTE: Students attempting at least 9 credits in a semester who fail to earn a Term GPA of at least 1.0 will be considered as not making Satisfactory Academic Progress

SAP REVIEW

At the end of each semester, the Registrar's Office will review each student's academic record to ensure that the student is meeting Satisfactory Academic Progress.

All students are categorized in three SAP groups: Good Standing, Academic Warning, and Academic Suspension.

If an Associate or Bachelor seeking student fails to meet satisfactory academic progress for one semester, he or she will be placed on Academic Warning and notified by letter to their permanent address. Certificate students will be placed on Academic Suspension. A student on Academic Warning retains their financial aid for an additional semester. Academic Warning means that students are no longer meeting the college's academic progress requirements.

These students are required to meet with their advisor within the first week of the semester to create an academic success plan.

It is required that these students meet regularly with their academic advisor to assess the academic success plan and regularly utilize tutoring services. Students on warning may elect to participate in a semester long seminar that focuses on improving their academic performance.

A student who fails to make Satisfactory Academic Progress for two consecutive semesters, reaches maximum time frame, or whose CGPA falls below 1.0 will be placed on Academic Suspension and notified by letter to their permanent address.

A student placed on Academic Suspension will lose financial aid eligibility and if he or she is registered for classes in the next semester, those classes will be dropped. A student placed on Academic Suspension has the right to appeal the suspension. If a student's appeal is accepted, that student's academic status will be changed to Probation. In addition, a student must also appeal to the Financial Aid Office to restore financial aid eligibility.

SUSPENSION APPEAL:

Suspension Appeals should be completed online at https://franklincummings.edu/sap-appeal/. Appeals submitted once the semester has begun might not be considered. Grounds for appeal include the student's documented illness, the death or serious illness of an immediate family member, or other unusual circumstances.

Documentation may be requested, depending on the nature of the appeal.

Once the appeal is filed, it will be preliminarily reviewed by the Dean of Student Affairs who may schedule an appointment with the appealing student. The Dean will then convene the SAP Appeal Committee to consider the request and render a decision about the student's ability to subsequently enroll. A member of the SAP Appeal Committee will contact the student with the committee's decision and any necessary actions that the student will need to take prior to matriculating. If a student's appeal is accepted, that student's academic status will be changed to Probation. Students on probation should promptly appeal to the Director of Financial Aid for financial aid eligibility.

DISMISSAL:

If a student fails to make Satisfactory Academic Progress at the end of the probationary semester or if he or she fails to maintain the conditions and benchmarks agreed upon in the academic plan, that student will be Dismissed from the college. Students who have been dismissed from the college shall be able to appeal their dismissal to the Dean of Student Affairs after the period of time designated by the Satisfactory Academic Progress Appeal Committee (not including summer terms).

Family Educational Rights and Privacy Act

Franklin Cummings Tech maintains the confidentiality of student educational records and protects the student's right of access to those records in accordance with the Family Educational Rights and Privacy Act (FERPA) of 1974 (P.L. 93-380) as amended (P.L. 93-568) (also known as the Buckley/Pell Amendment).

FERPA affords students certain rights with respect to their educational records. They are:

- The Family Educational Rights and Privacy Act (FERPA) (20 U.S.C. § 1232g; 34 CFR Part 99) is a Federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education.
- FERPA gives parents certain rights with respect to their children's education records. These rights transfer to the student when he or she reaches the age of 18 or attends a school beyond the high school level. Students to whom the rights have transferred are "eligible students."
- Students have the right to inspect and review the student's education records maintained by the school. Schools are not required to provide copies of records unless, for reasons such as great distance, it is impossible for parents or eligible students to review the records. Schools may charge a fee for copies.
- Students have the right to request that a school correct records which they believe to be inaccurate or misleading. If the school decides not to amend the record, the student then has the right to a formal hearing. After the hearing, if the school still decides not to amend the record, the student has the right to place a statement with the record, setting forth his or her view about the contested information.
- Generally, schools must have written permission from the student in order to release any information from a student's education record. However, FERPA allows schools to disclose those records, without consent, to the following parties or under the following conditions (34 CFR § 99.31):
    - School officials with legitimate educational interest;
    - Other schools to which a student is transferring;
    - Specified officials for audit or evaluation purposes;
    - Appropriate parties in connection with financial aid to a student;
    - Organizations conducting certain studies for or on behalf of the school;
    - Accrediting organizations;
    - To comply with a judicial order or lawfully issued subpoena;
    - Appropriate officials in cases of health and safety emergencies; and
    - State and local authorities, within a juvenile justice system, pursuant to specific State law.

Franklin Cummings Tech may disclose, without consent, "directory" information such as a student's name, address, telephone number, e-mail, date and place of birth, honors and awards, and dates of attendance. However, schools must tell students about directory information and allow students a reasonable amount of time to request that the school not disclose directory information about them. Students should contact the Registrar if they do not want their directory information released. Schools must notify students annually of their rights under FERPA. The actual means of notification (special letter, student handbook, or newspaper article) is left to the discretion of each school.

For additional information or technical assistance, you may call (202) 260-3887 (voice). Individuals who use TDD may call the Federal Information Relay Service at 1-800-877-8339.

Or you may contact us at the following address:

Family Policy Compliance Office
U.S. Department of Education
400 Maryland Avenue, SW
Washington, D.C. 20202-5920
http://www.ed.gov/policy/gen/guid/fpco/index.html

Academic Honesty

Academic dishonesty is a serious issue. Honesty in all academic work is expected of every student at all times. This means each individual does his or her own work without assistance from other sources on any assignment or exam unless otherwise directed by the instructor. You are unable to learn what you need to know if you do not do your own work.

A violation of academic honesty can include but not be limited to:

- Plagiarism
- Falsifying documents
- Submitting the same assignment in multiple classes
- Copying or sharing work from another student
- Aiding and abetting cheating
- Using any form of technology, i.e. cell phones, laptops, student S: drive, etc, as a tool for academic dishonesty

It is the responsibility of each student to understand Franklin Cummings Tech's expectations for academic honesty and to seek help in understanding the policy if necessary.

Franklin Cummings Tech instructors are obligated to investigate concerns regarding plagiarism when a student's in-class work differs significantly from his/her outside work. For example, an investigation may occur when one paper is noticeably different in fluency, style or syntax from others by the student; and/or, a paper obviously uses sources which are not cited or which are improperly acknowledged; and/or, work (papers, labs, exams) is submitted at a level of understanding and insight beyond that which a student has typically exhibited in his/her work.

To preserve the college's reputation and integrity, cases of academic dishonesty will be reported and students may face disciplinary action. Documentation of alleged violations, proceedings, and any resulting sanctions will be kept on file in the office of the Assistant Dean of Student Affairs until a student has graduated from the college. This file may be utilized in the event of any further infraction of institutional rules or policies.

With any suspected act of dishonesty, the instructor will provide documentation of the incident and any supporting evidence to the Assistant Dean of Student Affairs. Students will be contacted by the Assistant Dean of Student Affairs to discuss the incident and methods of prevention for the future. Based on the student's conduct history, the Assistant Dean of Student Affairs may refer the case to the Student Conduct Board.

The range of sanctions and the procedures followed are outlined below; however, implementation of sanctions will lie with the Hearing Officer or Student Conduct Board and may be adjusted. Faculty may be solicited for further information as well as appearing before the Student Conduct Board.

PROCEDURES AND SANCTIONING

A first violation of academic honesty will result in a meeting with the Assistant Dean of Student Affairs and may result in a failing grade for the assignment as well as an educational component to allow the student to learn from the process.

Educational sanctions may include online modules, research or reflection essays, meeting with the Director of Student Success, or other means to educate oneself or others on academic honesty.

A second violation of the academic honesty policy, whether this be in the same or a different course, will result in a meeting with the Assistant Dean of Student Affairs or the Student Conduct Board, and may result in a grade of F for the final course grade. Due to the repeat nature of the incident, the student may be subject to increased sanctioning including academic probation for a minimum of one semester and increased educational sanctions.

A third violation of the academic honesty policy will result in an automatic F for the course in which the infraction occurred and may include further disciplinary action including suspension or expulsion from the college. All documentation and evidence will be placed in the student's file and, in this case, may become a permanent record regardless of the student's graduation status at the college. A mandatory meeting will take place with the Dean of Academic Affairs and the student will have the opportunity to bring one member of the college's faculty or staff to serve as a support person. The support person will have the opportunity to speak on the student's behalf at the

student's request.

**Note: If suspension is part of the sanction for a 3rd offense and a student is found responsible for another incident of Academic Honesty upon returning to the college, this may be grounds for automatic expulsion.*

Students will receive written notification within one week after meeting with a Hearing Officer or the Student Conduct Board.

Appeal Process

To initiate the appeal process, students will submit their appeal, electronically, in writing to the Dean of Student Affairs (or designee). Appeals must be received within five (5) class days of the date of the outcome of the conduct meeting.

A student should submit a formal and well written appeal:

- To appeal a "responsible" decision for one or all violations from the original verdict
- To appeal the level sanctioning from the original hearing body

It is up to the student(s) appealing to be persuasive and professional in their appeal letter. Appeal arguments should detail any information that was not available at the time of the original conduct meeting, as well as any additional information that is provided by witnesses or character references.

The decision to proceed with the appeal submitted is up to the discretion of the Dean of Student Affairs and/or designee. If the decision is to proceed, then every effort will be made to schedule an appeal meeting within five (5) class days.

Within 48 hours of submission, students will be notified if their appeal meets the above criteria and will be scheduled for an appeal meeting or if their appeal does not meet the criteria and is denied.

Since the appeal officer is never an eyewitness, he/she may never have absolute proof of what really happened. The best the appeal officer/panel can do is to be persuaded of what probably happened. The preponderance of evidence is used to base a decision during the conduct system and can be defined as – the lowest level of proof which typically means more likely than not.

Since the original Conduct Officer has ruled on responsibility based on a preponderance of the evidence, the appeal is not a re-hearing of the original case. Instead, the student has the opportunity to present any new information which supports the reason for the appeal, including new information that was not previously available, information regarding excessive or inappropriate sanctions, information to prove the finding was not supported by the evidence, and/or information regarding procedural errors. The appeal officer will then render a decision based on the information provided.

The decision by the appeal officer will be based on any of the following criteria:

- Procedural error
- Finding not supported by the evidence
- Excessive or inappropriate sanction
- New evidence not previously available

The Appeal Officer may make the following decisions:

- Uphold previous decision/sanctioning
- Revise previous decision/sanctioning
- Overturn previous decision/sanctioning
- Refer the case back to the original Hearing Officer for a rehearing (in case of procedural errors)

The appeal may never increase any sanctions or add charges. Students should be aware that any outcome of the appeal is final.

Students will be notified of the outcome of their appeal in writing within 48 hours of their appeal meeting. Students should be aware that during the appeal process, all sanctions and limitations are in effect unless otherwise noted.

**Note: if multiple violations of academic honesty occur within a timeframe prior to required meetings taking place, the violations will be still be treated as individual occurrences and subject to disciplinary action as outlined above.*

Change of Major

All changes of major are handled during the registration process by the Advisor, Registrar's Office, and student. If the advisor and student come to an agreement, the Registrar and Financial Aid will be notified. The Registrar will then process the official change.

Transfer of Credit

Students who wish to take courses at other colleges to satisfy requirements in their programs at Franklin Cummings Tech must:

- Obtain course descriptions from the prospective school.
- Receive endorsement from the appropriate Department Chair or Registrar at Franklin Cummings Tech.
- If approval is given, the student must earn a grade of C or better in the course and provide an official transcript of this grade to the Registrar. Please note: the grade you receive will not be reflected in your grade point average at Franklin Cummings Tech.

Graduation Requirements

Students in good standing who satisfy the following minimum requirements will be recommended by the faculty for graduation:

- A student must obtain a minimum GPA of 2.00 in all the credit bearing courses in a student's major as defined by the course catalog as reflected on the Student's Degree Audit.
- Earn a cumulative grade point average of 2.00 or better

Degree seeking students who have no more than two requirements left to graduate may participate in the annual graduation ceremony provided they meet the requirements for graduation listed above. Students with three requirements left may appeal to the Registrar's Office. Students in certificate programs who complete all of their requirements by the end of the summer semester will be allowed to participate in the graduation ceremony.

Students earning a grade point average of 3.5 or higher qualify for honors distinctions. Such honors are determined by a student's cumulative grade point average once all required coursework is complete and is awarded in the following categories:

- Cum Laude: 3.50-3.74 cumulative grade point average
- Magna cum Laude: 3.75-3.89 cumulative grade point average
- Summa cum Laude: 3.90-4.00 cumulative grade point average

Petition to Graduate

Students who plan to graduate must inform the Registrar of their intention by filing a petition to graduate form at least four weeks before the commencement date. This form can be accessed online at https://franklincummings.edu/academics/registrar/grad-petition/. Prior to filling out this form, potential graduates must complete Financial Aid exit counseling, complete the career service survey, and clear any outstanding college balance.

The Registrar's Office then verifies that all individual program requirements have been met and that the student is qualified to graduate.

Automotive Technology (AS)

The automotive industry offers exciting and rewarding careers for people who have an interest in diagnosing and repairing mechanical components and computer/electrical circuitry.

Additionally, these careers contribute significantly to a cleaner environment and the safety of the general public.

This industry is not limited to automobiles, as it covers a broad spectrum that includes marine, heavy-duty trucks, offroad equipment, recreational vehicles and stationary power plants.

Graduates of the Automotive Technology program are prepared for employment in the automotive industry as technicians, machinists, unit specialists, emission and performance diagnosticians, department managers, and manufacturer's representatives.

The college enhances opportunities for employment through close association with dealerships and independent repair facilities throughout Massachusetts. Successful completion of this program provides the student with an Associate of Science degree and the opportunity to continue in the Bachelor of Science program in Automotive Management.

The Automotive Department strongly endorses Automotive Service Excellence (ASE) Certification. All of the

Automotive Faculty are ASE Certified, and we encourage our students to take these tests for national certification, as they are ready.

Curriculum

In keeping with the college's mission, the objectives of this Associate of Science program are to provide a theory-based automotive education, supported by practical experience that meets the college's history of high academic standards. Additionally, these standards allow graduates to improve themselves personally, economically and socially, and to provide a foundation for lifelong learning. Degree requirements are further supported by general education components, including proficiency in oral and written communication, math, and physics.

The majority of this two-year program is devoted to automotive technical specialties, including actual work on live vehicles in the student Automotive Training Center.

In addition to the mechanical technologies, the program is complemented by the study of mathematics, physics, humanities, and social sciences. Humanities, social sciences, and English courses comprise part of the curriculum to ensure that the graduates possess broader social visions and effective communication skills.

All Franklin Cummings Tech students are required to successfully complete a Career Success Seminar course prior to graduation. Typically, students are enrolled in this course for the semester prior to graduation. Please note this course may be added to a student's course load after the registration process, and thus may not be visible on a student's schedule until a few weeks prior to their final semester.

Special Admission Requirements for Automotive Technology Program

Due to the unique environment of automotive laboratories and repair facilities with regard to the safe operation of machinery, repair equipment, running engines, etc., the following is required of applicants to the Automotive Program:

- Correctable vision and hearing
- Ability to stand on one's feet for long periods
- Ability to lift 30 pounds
- For continuation into the second year of the program involving the Automotive Training Center, students are required to have a valid driver's license
- Students are required to purchase first-year and second-year tool sets

Facilities

The Automotive Department maintains laboratories for the study of automotive electricity, internal combustion engines, automatic and manual transmissions, chassis and brakes, hybrid and alternate fuels, engine performance as well as a

Twelve-bay working laboratory and a Drivability Clinic equipped with state-of-the-art equipment.

Outcomes

Upon successful completion of the Associate Degree in Automotive Technology, the graduate will be able to:

- Demonstrate diagnostic strategies, using electronic/mechanical principles, to effectively repair vehicle management systems in accordance with manufacturers, State and Federal guidelines.
- Demonstrate, through practical example, written and verbal presentation, an understanding of automotive industry safety, emerging technologies, economics, government regulations and business models.
- Demonstrate an understanding of the internal combustion engine by utilizing diagnostic strategies that effectively repair an internal combustion engine.
- Understand DC electricity and demonstrate diagnostic repair strategies for automotive electrical components and systems that effectively repair electrical components.
- Utilize mathematical calculations, principles, and formulae to perform a variety of tasks related to automotive system repair.
- Effectively diagnose, repair, and adjust various subsystems, including: suspensions, brakes, transmissions, heating and air conditioning, and lighting systems.
- Identify and repair safety-related issues relative to automotive vehicles that concern the operator, passengers and general public.
- Demonstrate the proficient use of scan tools and other diagnostics test equipment that will aid in repairing the customers complaint with precision accuracy.
- Demonstrate specific techniques to determine the different failures between gasoline, diesel, hybrid and electric vehicles and understanding necessary repairs.

Faculty

Program Chair: James Dellot

Instructor Staff: Bill Hans, Ed Mackness, Evan Mancini, Bill O'Neill, Margaret O'Neill, Curt Raposa, Don Tuff

Degree Requirements: Automotive Technology (AS) 72 Credits

TECHNOLOGY COURSES: 51 CREDITS

Course #	Course	Credits	Lecture	Lab
AT134	Automotive Brake Systems	4	3	3
AT150	Automotive Engines	4	3	3
AT170	Electricity & Electronics	4	3	3
AT173	Automotive Electrical Systems	4	3	3
AT234	Automotive Chassis and Suspension	3	2	3
AT241	Manual Transmissions	2	1	2
AT244	Automatic Transmissions	2	1	2
AT252	Air Conditioning	3	2	2
AT253	Automotive Lab I	4	0	8
AT254	Automotive Lab II	4	0	8
AT255	Alternative Fuels	3	2	2
AT259	Introduction to Automotive Safety and Technology	3	2	2
AT271	Engine Performance I	4	4	0
AT274	Engine Performance II	4	4	0
AT282	Service Advising	3	3	0

GENERAL EDUCATION COURSES: 21 CREDITS

EN129/130	College Composition I	3	3	0
EN140	College Composition II	3	3	0
HU/SS	Social Science Elective	3	3	0
HU/SS	Social Science Elective	3	3	0
MA105	Technical Math I	3	3	0
MA106	Technical Math II	3	3	0
PH102	Physics	3	3	0

* Students transferring in a higher level math may substitute an HU/SS Social Science Elective for a lower level math.

Typical Course Sequence for Automotive Technology (AS)

SEMESTER 1

- AT150 Automotive Engines
- AT170 Electricity & Electronics
- AT259 Intro to Automotive Safety and Technology
- EN129/130 College Composition I
- MA105 Technical Math I

SEMESTER 2

- AT134 Automotive Brake Systems
- AT173 Automotive Electrical Systems
- EN140 College Composition II
- MA106 Technical Math II
- PH102 Physics

SEMESTER 3

- AT234 Automotive Chassis and Suspension
- AT241 Manual Transmissions
- AT253 Automotive Lab I
- AT255 Alternative Fuels
- AT271 Engine Performance I
- HU/SS Social Science Elective

SEMESTER 4

- AT244 Automatic Transmissions
- AT252 Air Conditioning
- AT254 Automotive Lab II
- AT274 Engine Performance II
- AT282 Service Advising
- HU/SS Social Science Elective

Automotive Technology with a Concentration in Electrical Vehicle Technology (AS)

Program Overview

The automotive industry is going electric, and with less than 2% of all ASE (Automotive Service Excellence) technicians having Electric Vehicle (L3) certification, there is a tremendous opportunity for those who have the ambition and skills to enter this high-tech field of Hybrid/Electric vehicle repair. This associate degree program will prepare students to work as entry-level Hybrid/EV and charging station technicians with concentrations in Electric Vehicle Safety, Charging Station Installation and Maintenance, Battery Technology, and Battery Management.

FCT's Associates in Science in Automotive Technology with a concentration in Electric Vehicle Technology combines lectures with hands-on lab experiences to teach students the technical skills they need to perform repairs to both HEVs and Electric Vehicle Charging Stations.

Learning outcomes and careers

Students who graduate from this program will be able to:

- Understand the operation of the battery-driven electric vehicles
- Identify the components and characteristics that make up the different Hybrid and Electric Vehicles (HEV) on the road today.
- Diagnose HEV drivability concerns.
- Service a hybrid vehicle's climate control system.
- Apply High Voltage safety practices
- Describe the functions performed by a Battery Management System (BMS)
- Compute the temperature response of battery cell and pack assemblies for a simple model
- Explain different approaches to estimating state of charge, state of health, power and energy
- Apply the operation of brushless dc and induction motors to HEV and EV vehicles
- Define the torque speed curves for motors and the application to electric and hybrid electric vehicles

Sample Job titles:

Electric Vehicle Technician

Electric Vehicle Charging Field Service Technician

EV Battery Support Specialist

Electric Vehicle Production Technician

Course Curriculum (Duration: 2 years)

Degree Requirements: Automotive Technology with a Concentration in Electrical Vehicle Technology (AS) 65 Credits

CORE TECHNICAL COURSES: 44 CREDITS

Course #	Course	Credits	Lecture	Lab
EV101	Introduction to Electric Vehicles	4	3	2
EV107	Intro. To EV Charging Stations	4	3	2
EV211	Battery Technology	3	2	2
EV214	High-Voltage Management.	3	2	2
AT134	Automotive Brake Systems.	4	3	3
AT234	Automotive Chassis and Suspension	3	2	3
AT253	Automotive Lab I.	4	0	8
AT254	Automotive Lab II	4	0	8
EE105	Introduction to Electricity	4	3	2
EE131	Digital Principles.	4	3	2
ME205.	Solar Energy and Photovoltaics.	4	3	2
ME210.	Energy Efficiency and Auditing	3	3	0

GENERAL EDUCATION COURSES: 21 CREDITS

Course #	Course	Credits	Lecture	Lab
EN129/130	College Composition I	3	3	0
EN140	College Composition II.	3	3	0
EN320	Technical Communication.	3	3	0
HU/SS.	Social Science Elective.	3	3	0
MA120	College Algebra and Trigonometry	3	3	0
TS201	Environmental Science	3	3	0
PH102	Physics	3	3	0

Typical Course Sequence for Automotive Technology with a concentration in Electric Vehicle Technology (AS) Certificate

SEMESTER 1

- EV101 Introduction to Electric Vehicles
- EE105 Introduction to Electricity (DC/AC)
- EN130 College Composition I
- MA120 College Algebra
- EE131 Digital Principles

SEMESTER 2

- EV107 Intro to EV Charging Stations
- AT134 Automotive Brakes
- EN140 College Composition II
- PH 102 Physics

SEMESTER 3

- HU/SS Elective
- TS201 Environmental Science
- ME210 Energy Efficiency and Auditing
- AT253 Automotive Lab I
- AT 234 Automotive Chassis and Suspension

SEMESTER 4

- ME205 Solar Energy and Photovoltaics
- EV211 Battery Technology
- EV214 High Voltage Management
- AT254 Automotive Lab II
- EN320 Technical Communication

Automotive Technology (Certificate)

The Automotive Technology Department also offers a certificate program in automotive technology. The certificate program prepares students for entry level positions in the Automotive Technology field and contains 8 essential courses. Normally, the program can be completed in 1 year. This program follows all federal regulations regarding gainful employment. Credits from this certificate program may be applied toward an associate degree in the Automotive Technology at Franklin Cummings Tech.

- Demonstrate diagnostic strategies, using electronic/mechanical principles, to effectively repair vehicle management systems in accordance with manufacturers, State and Federal guidelines.
- Demonstrate through practical examples and written and verbal presentation, an understanding of automotive industry safety, emerging technologies, economics, government regulations and business models.
- Demonstrate an understanding of the internal combustion engine by utilizing diagnostic strategies that effectively repair an internal combustion engine.
- Understand DC electricity and demonstrate diagnostic repair strategies for automotive electrical components and systems that effectively repair electrical components.
- Utilize mathematical calculations, principles, and formulae to perform a variety of tasks related to automotive system repair.
- Identify and repair safety-related issues, relative to automotive vehicles, that concern the operator, passengers and general public.

Faculty

Program Chair: James Dellot
Instructor Staff: Bill Hans, Ed Mackness, Evan Mancini, Bill O'Neill, Margaret O'Neill, Curt Raposa, Don Tuff

Degree Requirements: Automotive Technology (Certificate) 29 Credits

TECHNOLOGY COURSES: 29 CREDITS

Course #	***Course***	***Credits***	***Lecture***	***Lab***
AT134	Automotive Brake Systems	4	3	3
AT150	Automotive Engines	4	3	3
AT170	Electricity & Electronics	4	3	3
AT173	Automotive Electrical Systems	4	3	3
AT234	Automotive Chassis and Suspension	3	2	3
AT252	Air Conditioning	3	2	2
AT256	Automotive Lab-Certificate	3	0	6
AT271	Engine Performance I	4	4	0

Typical Course Sequence for Automotive Technology Certificate

SEMESTER 1

AT134	Automotive Brake Systems
AT150	Automotive Engines
AT170	Automotive Electricity and Electronics

SEMESTER 2

AT173	Automotive Electrical Systems
AT234	Automotive Chassis and Suspension
AT252	Air Conditioning
AT271	Engine Performance I

SEMESTER 3

AT256	Automotive Lab-Certificate

Computer Information Technology (AS)

The Associate of Science (AS) in Computer Information Technology (CIT) is a two-year program that provides students with the knowledge and training for a range of positions in the areas of computer system operations and support, maintenance, database management, networking, computer programming and system administration. All graduates leave the program prepared for positions as computer support specialists, junior network technicians and entry-level database administrators. Students wishing to complete their IT credentials in a shorter period of time, like in two semesters, can start with one of the three new certificate programs currently offered by the College, in response to the COVID-19 pandemic. They are Network and Systems Support, Software Development, Web Design. Their curricula are discussed below.

Outcomes

Upon successful completion of the Associate of Science Degree in Computer Information Technology, all graduates will be able to:

- Design and develop entry-level database application systems.
- Provide beginner-level computer programming and web design.
- Employ hardware/software knowledge to configure, install, support, and maintain computer and network systems.
- Manage and maintain enterprise database application systems.
- Administer computer and network services and security.
- Install, maintain, upgrade and manage Windows-based computer and related server and network systems.
- Understand and apply the fundamental knowledge of mathematics to solving of computer related problems.
- Effectively communicate technical observations, results, issues, and successes, in both oral and written form.
- Continue education toward a BS degree in four-year computer technology and related programs.
- Explain why continuing education and professional organizations, such as: IEEE, ACM, CompTIA, the Linux Foundation and others are viewed as vehicles for lifelong learning for accessing learning, networking, and certification opportunities.
- Understand professional, ethical, and social responsibilities.

Faculty

Program Chair: Dr. Fathima James

Instructor staff: Dr. Fathima James, Richard Azzi, Margaret Goodwyn, Micheal Lord, Rachid Elaafer, Timothy Frederickson, Steven Garcia, Rashian Burns, David LaFond, and Olumide Adebayo

Degree Requirements: Computer Information Technology (AS) 61 Credits

TECHNOLOGY ELECTIVE OPTIONS (37 CREDITS)

Course #	***Course***	***Credits***	***Lecture***	***Lab***
CT121	Web Design I	3	2	2
CT122	Web Design II	3	2	2
CT140	Google IT support Certificate Program	6	4	4
CT143	Introduction to Programming Logic and C++	4	3	2
CT144	Intermediate C++ Programming	4	3	2
CT146	Introduction to Java Programming	4	3	2
CT147	Introduction to React JavaScript	4	3	2
CT211	Website Management	3	2	2
CT212	System Maintenance and Management I	3	1	4
CT213	System Maintenance and Management II	3	1	4
CT221	Enterprise Database Management	3	2	2
CT231	Linux System Administration	3	2	2
CT233	Windows System Administration	3	2	2
CT247	Intermediate React JavaScript	4	3	2
CT249	Survey of Contemporary Programming Languages	4	3	2
CT250	Fundamentals in Python	4	3	2
CT267	Networking II	4	3	2
CT275	Agile Project Management	3	2	2
CT277	Topics in Network and System Support Employment Readiness	3	2	2
CT278	Topics in Web Design Employment Readiness	3	2	2
CT365	Network Security	4	3	2

NETWORKING REQUIREMENTS (3 CREDITS)

CT165	Introduction to Networking	3	2	2

CORE GENERAL EDUCATION COURSES (12 CREDITS)

EN129/130	College Composition I	3	3	0
EN140	College Composition II	3	3	0
EN320	Technical Communication	3	3	0
HU/SS	Social Science Elective	3	3	0

MATH ELECTIVE OPTIONS (6 CREDITS)

MA105	Technical Mathematics	3	3	0
MA120	College Algebra and Trigonometry	3	3	0
MA130	Pre-Calculus	3	3	0
MA240	Calculus I	4	4	0
MA250	Calculus II	4	4	0
MA270	Statistics	3	3	0

GENERAL ELECTIVE OPTION (3 CREDITS)

HU/SS	Social Science Elective	3	3	0
MA130	Pre-Calculus	3	3	0
MA240	Calculus I	4	4	0
MA250	Calculus II	4	4	0
MA270	Statistics	3	3	0

Typical Course Sequence for the Associate of Science in Computer Information Technology (61 Credits)

SEMESTER 1

CT140	Google IT support Certificate Program
CT143 or 146	Introduction to C++ or Java programming
EN129/130	College Composition I
MAE1	MA105 or higher

SEMESTER 2

CT221	Enterprise Database Management
CT233	Windows System Administration
CT250	Fundamentals in Python
EN140	College Composition II
MAE2	MA120 or higher

SEMESTER 3

CT165	Introduction to Networking
CT212	System Maintenance and Management I
CT231	Linux System Administration
EN320	Technical Communication
HU/SS	Social Science Elective

SEMESTER 4

CT121	Web Design I
CT269	Cloud Computing and Virtualization
CT365	Network Security
HU/SS	Social Science Elective

As mentioned above, in response to the COVID-19 crisis, the College also offers three short-term certificate programs that prepare students for entry-level positions in the area of: 1) Network and Systems Support, 2) Software Development. Each comprises 8 - 9 fundamental courses, totaling 29 credits. These courses leverage the expertise of CT faculty who also teach in the above AS in CT program. The certificate programs are designed to be completed in two semesters or one year. Upon completion of selected certificate program, graduates will earn a Franklin Cummings Tech-issued certificate of completion, in addition to industry certification(s) they have gained in program courses. Moreover, the credits gained from the certificate program completion can be stacked and applied toward the above Associate of Science degree in Computer Information Technology program. The curriculum for the Networking & Systems Support certificate program is discussed below.

Cybersecurity Concentration (*AS*)

The associate degree in Cybersecurity program prepares students either for transfer to a related bachelor's degree program in Cybersecurity or for employment in various entry-level information security analyst and risk/vulnerability analyst positions in network security administration. Cyber-related offense detection and prevention, Problem-solving and analytical thinking are emphasized throughout the program, with a hands-on approach to learning. Additionally, this Cybersecurity program covers substantial areas that deal with cybersecurity management, incident response, and security threat assessment, which requires students to be creators of knowledge and inventors of processes.

Program Outcomes:

Graduates of the Computer Information Technology Cybersecurity program will be able to:

- Solve cybersecurity challenges by analyzing problems, managing, and storing data, logic and critical thinking, and interpreting results for relevance, accuracy, and consistency.
- Recognize current solution patterns for common problems and adapt those solutions to new situations.
- Configure and operate computing systems to meet the operational and cybersecurity needs of an organization.
- Identify and have some familiarity with tools and techniques for vulnerability and penetration testing of systems.
- Evaluate and develop risk management policies to protect the confidentiality, integrity, and accessibility of an organization's information and assets.
- Collaborate effectively with others to design, evaluate, present, and implement solutions to cybersecurity problems.

Degree Requirements: Cybersecurity Concentration (AS) 65 Credits

TECHNICAL COURSES (44 CREDITS)

Course #	***Course***	***Credits***	***Lecture***	***Lab***
CT165	Introduction to Networking	3	2	2
CS105	Network Communication and Security Fundamentals	4	3	2
CT250	Fundamentals in Python	4	3	2
CT267	Networking II	4	3	2
CS110	Introduction to Cybersecurity and Risk Management	4	3	2
CT231	Linux System Administration	3	2	2
CS205	Intrusion Detection and Prevention Systems	4	3	2
CS215	Digital Forensics	4	3	2
CS245	Network and Systems Administration	4	3	2
CT221	Enterprise Database Management	3	2	2
CT269	Cloud Computing and Virtualization Fundamentals	4	3	2
CS255	Security Automation System	3	2	2
CS280	Ethical Hacking and Systems Defense	3	2	2
CT277	Topics in Network and System Support Employment Readiness	3	2	2

CORE GENERAL EDUCATION COURSES (21 CREDITS)

Course #	Course	Credits	Lecture	Lab
EN130	College Composition	3	3	0
MAE1	Math Elective	3	3	0
MAE2	Math Elective	3	3	0
EN140	College Comp. II	3	3	0
EN320	Technical Communication.	3	3	0
HU/SS	Social Science Elective.	3	3	0
	Math/Social Science Elective	3	3	0

Typical Course Sequence for the Associate of Science in Cybersecurity Concentration (65Credits)

AS DEGREE IN CT - CYBERSECURITY TRACK

YEAR 1 SEMESTER 1

CT165	Introduction to Networking
CS105	Network Communication and Security Fundamentals
EN130	College Composition I
MAE1	MA105 or MA120 or MA130 or MA240
CT250	Fundamentals in Python

SEMESTER 2

CT267	Networking II
CS110	Introduction to Cybersecurity and Risk Management
CT231	Linux System Administration
EN140	College Composition II
MAE2	MA120 or MA130 or MA240 or MA250

SEMESTER 3

CS205	Intrusion Detection and Prevention Systems
CS215	Digital Forensics
CS245	Network and Systems Administration
HU/SS	Social Science Elective
EN320	Technical Communication

SEMESTER 4

MA/SS	Math/Social Science Elective
CS255	Security Automation System
CS280	Ethical Hacking and Systems Defense
CT277	Topics in Cybersecurity Employment
SK200	Career Seminar

Certifications

NETWORKING AND SYSTEMS SUPPORT

The Networking & Systems Support certificate program focuses on installing, configuring, and supporting IT infrastructure and the various operating systems, while incorporating the principles, and protocols in networked systems, and the different networking technologies.

Outcomes

Upon successful completion of the Networking & Systems Support certificate program, all graduates will be able to:

- Install, maintain, upgrade and manage Linux-based computer and related server and network systems.
- Install, maintain, and administer Windows operating systems, including Office 365
- Employ hardware/software knowledge to configure, install, support, and maintain computer and network systems.
- Perform IT support tasks typically conducted on a daily basis, including computer assembly, wireless networking, network Infrastructure and troubleshooting, installing programs, and customer service
- Provide end-to-end customer support, ranging from identifying problems to troubleshooting and debugging
- Install, configure and troubleshoot PC hardware and software, also involving virtualization, cloud computing, and printers

Typical Course Sequence for the Networking & Systems Support Certificate Program (29 Credits)

SEMESTER 1

CT140 Google IT support Certificate Program
CT146 Introduction to Java Programming
CT165 Introduction to Networking
CT212 System Maintenance & Management I

SEMESTER 2

CT213 System Maintenance & Management II
CT231 Linux System Administration
CT233 Windows System Administration
CT267 Networking II

In order to earn the Associate of Science in Computer Information Technology, (61 Credits) the Network & Systems Support certificate graduates just need to complete the below courses.

SEMESTER 3

CT277 Topics in Network and System Support
Employment Readiness
EN129/130
College Composition I
EN320 Technical Communication
HU/SS Social Science Elective
MA MA105 or MA120 or MA240

SEMESTER 4

CT269 Cloud Computing and Virtualization Fundamentals
CT365 Network Security
EN140 College Composition II
MA MA120 or MA130 or MA250
MA/SS Math/Social Science Elective

SOFTWARE DEVELOPMENT

The Software and Web development concentration focuses on the design and development of software solutions based on user needs and requirements and the development of interactive web applications that integrates responsive design, multimedia, and database connectivity. Students learn software development lifecycle (SDLC) phases, developing, delivering, and maintaining software products, interactive Web Design and Development that yield visible and audible results through web pages, and methods of enhancing the user experience using industry standard programming and scripting languages, tools, and integrated development environments (IDEs).

Outcomes

Upon successful completion of the Software Development certificate program, all graduates will be able to:

- Develop coding and programming skills as well as the soft skills needed to creatively solve business problems.
- Apply software and web technology principles and practices to real-world solutions.
- analyze the concepts, techniques, and tools necessary for software and Web application design, testing, maintenance, and teamwork.
- Use modern programming tools, such as git (including GitHub), as well methodologies like agile for software engineering.
- Develop computer programming in C++, Java, Python, as well as data structures or algorithms and the incorporation of relational databases for back-end related tasks.
- Use React JavaScript to conduct front end (or client-side) software development to build user interfaces.
- Design and develop websites using HyperText Markup Language 5 (HTML 5), Extensible HyperText Markup Language (XHTML), Cascading Style Sheets 3 (CSS3), animation, and client scripting.
- Design and develop websites using contemporary web design software, such as JavaScript programming language.
- Develop and manage websites using Hypertext Preprocessor (PHP) to interact with MySQL database system on a local machine as well as hosted servers.
- Use programming, troubleshooting, and debugging skills to identify and fix problems with Software and Web applications.
- Confidently pursue a bachelor's degree or professional employment in software and web development areas.

Typical Course Sequence for the Software Development Certificate Program (29 Credits)

SEMESTER 1		SEMESTER 2	
CT140	Google IT Support Certificate Program	CT146	Introduction to Java Programming
CT125	Web Design	CT149	React Java Script
CT148	C++ Programming	CT221	Enterprise Database Management System
SK120	Success in CT	CT250	Fundamentals in Python

In order to earn the Associate of Science in Computer Information Technology, (61 credits) the Software Development certificate graduates just need to complete the below courses.

SEMESTER 3		SEMESTER 4	
CT160	Networking	MA	MA120 or MA130 or MA250
EN129/130	College Composition I	MA/SS	Math/Social Science Elective
EN320	Technical Communication	EN140	College Composition II
HU/SS	Social Science Elective	CT275	Agile Project Management
MA	MA105 or MA120 or MA240	CT211	Web Site Management

PROFESSIONAL CERTIFICATIONS STUDENTS CAN EARN TAKING CIT COURSES

- CompTIA Linux+
- CompTIA Network +
- CompTIA A+
- AWS Certified Cloud Practitioner
- Certified JavaScript Developer by JavaScript Institute
- CIW Site Development Associate
- Exam MS-900: Microsoft 365 Fundamentals
- C++ Certified Associate Programmer (CPA)
- Python Institute Certified Entry-Level Python Programmer (PCEP)

Construction Management (AS)

An associate degree in Construction Management provides graduates with a background of technical and organizational skills that apply to construction projects from conception to completion. Construction Management students study the skills necessary to manage resources, time, cost and quality with emphasis on team building. Students will also refine their ability to communicate, establish a foundation in math and science, and develop analytical and informational skills. Experiential components will be included to enhance the job-readiness of graduates and to build student engagement with the program.

The program includes technical courses in building technology, heavy construction, construction management and a general education core. The construction management courses provide familiarity with the vocabulary of construction management and a thorough introduction to the techniques of the building industry. These courses provide familiarity with the vocabulary of building and a thorough introduction to the techniques of the building industry. The courses establish a foundation in construction graphics, construction methods and material technologies, statics and strength of materials, sustainable building technologies, surveying and environmental systems.

The construction management courses develop the variety of skill areas that support a successful construction firm. Students are provided opportunities to work with employers through the Construction Management Internships, Construction Mentor Program and fulltime employment upon completion of their degree. All courses are taught by FC Tech full time faculty and selected adjuncts

All Franklin Cummings Tech students are required to successfully complete two Career Success Seminar courses prior to graduation. Typically, students are enrolled in this course for the first and third semesters prior to graduation. Please note this course may be added to a student's course load after the registration process, and thus may not be visible on a student's schedule until a few weeks prior to their final semester.

Outcomes

Upon successful completion of the associate degree in CM, the graduate will be able to:

- Apply knowledge in planning, budgeting, and scheduling of labor, materials and equipment.
- Apply quality standards in construction.
- Communicate in speech and in writing.
- Estimate job costs and requirements for construction projects.
- Identify construction project objectives and assist in their execution.
- Identify elements of sustainability in buildings and construction and explain their costs and benefits.
- Oversee project safety.
- Read and revise construction documents as a communication tool, including CAD files.
- Select contractors, sub-contractors and set project performance goals.
- Use knowledge of construction and management principles and practices to support continued learning.
- Work ethically and responsibly in the construction industry.
- Work on teams to solve management and technical problems.

Faculty

Leslie Tuplin, Program Chair

Instructor Staff: Lap Yan , Terry McGovern, David Polson, Gregg Stanley

Degree Requirements: Construction Management (AS) 60 Credits

TECHNOLOGY COURSES: 40 CREDIT HOURS

Course #	Course	Credits	Lecture	Lab
CM100	Building Construction Graphics	3	2	2
CM110	Construction Management I	3	3	0
CM120	Introduction to CAD	3	1	4
CM130	Construction Estimating	3	3	0
CM145	Heavy Construction	3	3	0
CM160	Building Materials and Applications	4	3	2
CM210	Construction Management II	3	3	0
CM220	Sustainable Building Technologies	3	3	0
CM240	Environmental Systems	4	3	2
CM250	Construction Surveying	4	4	1
CM260	Project Scheduling	3	3	0
CM280	Statics & Strength of Materials	4	4	1

GENERAL EDUCATION COURSES: 20 CREDIT HOURS

EN129/130	College Composition I	3	3	0
EN140	College Composition II	3	3	0
MA115	Plane and Solid Geometry	4	4	0
MA120	College Algebra and Trigonometry	3	3	0
PH212	Physics I	4	3	2

* Students transferring in a higher level math may substitute an HU/SS Social Science Elective for a lower level math.

Typical Course Sequence for Construction Management

SEMESTER 1

- CM100 Building Construction Graphics
- CM110 Construction Management I
- CM160 Building Materials and Applications
- EN129/130 College Composition I

SEMESTER 2

- CM120 Introduction to CAD
- CM130 Construction Estimating
- CM145 Heavy Construction
- EN140 College Composition II
- MA120 College Algebra and Trigonometry

SEMESTER 3

- CM220 Sustainable Building Technologies
- CM260 Project Scheduling
- HU/SS Social Science Elective
- MA115 Plane and Solid Geometry
- PH212 Physics I

SEMESTER 4

- CM210 Construction Management II
- CM240 Environmental Systems
- CM250 Construction Surveying
- CM280 Statics & Strength of Materials

Construction Management Certificate

Fast-paced, seven-week courses focus on estimating, scheduling, sustainable building technologies, and other key skill areas. Through this Certificate program, you will earn 19 credits, in which can be transferred into the Associate of Science in Construction Management.

Course #	***Course***	***Credits***	***Lecture***	***Lab***
CM100	Construction Graphics & Documents	3	3	0
CM110	Construction Management	3	3	0
CM130	Construction Estimating	3	3	0
CM160	Building Materials and Applications Methods	4	3	2
CM220	Sustainable Building Technologies	3	3	0
CM260	Project Scheduling	3	3	0

Electrical Engineering (BS)

The bachelor's degree program in Electrical Engineering provides the needed knowledge and skills for graduates to enter careers in the field of electrical engineering or to enroll in a graduate program in electrical engineering. In addition, graduates will be able to make contributions to industry and to the field of electrical engineering.

The program places special emphasis on electric power due to the unique opportunities for those entering the power industry today, and the huge changes in the industry arising from green technologies. The emergence of a smart grid that detects and responds quickly to local power usage will afford opportunities for electrical engineering graduates with knowledge of electric power fundamentals.

All Franklin Cummings Tech students are required to successfully complete a Career Success Seminar course prior to graduation. Typically, students are enrolled in this course for the semester prior to graduation. Please note this course may be added to a student's course load after the registration process, and thus may not be visible on a student's schedule.

Outcomes

Upon successful completion of the Bachelor's Degree in Electrical Engineering, all graduates will have:

- Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- Ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- Ability to communicate effectively with a range of audiences
- Ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- Ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- Ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- Ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Faculty

Chair: Dr. Craig Christensen

Instructor staff: Dr. Lisa Shatz, Dr. Greg Sonek, Dr. Mostapha Ziad (part time)

Degree Requirements: Electrical Engineering (BS) 120 Credits

TECHNICAL COURSES: 62 CREDITS

Course #	***Course***	***Credits***	***Lecture***	***Lab***
CM120	Introduction to CAD	3	1	4
CT143	Intro to C++ Programming	4	3	2
ECE101	Digital Electronics	4	3	3
ECE105	Circuit Theory	4	3	3
ECE205	Circuit Theory II	4	3	3
ECE225	Linear Systems	4	3	3
ECE206	Solid State Devices	4	3	3
ECE270L	Statistics for Engineers Lab	1	0	3

ECE307	Power Systems I	4	4	0
ECE308	Power Systems II	4	3	3
ECE311	Embedded Systems	4	3	3
ECE325	Statistics for Engineers	3	3	0
ECE325L	Statistics for Engineers Lab	1	0	2
ECE335	Control Systems	4	3	3
ECE403	Electromagnetic Theory	4	3	3
ECE410	Communication Systems	4	3	3
ECE414	Engineering Senior Project I	1	1	0
ECE415	Engineering Senior Project II	4	3	3
ECE430	Digital Signal Processing	4	3	3
ENS103	Intro to Engineering	4	3	3
ENS202L	Engineering Technical Communication	4	3	3

ECE ELECTIVE OPTIONS: 4 CREDITS

ECE306	Solid State Devices and Circuits II	4	3	3
ECE309	Labview and Electric Circuits and Machines	4	3	3
ECE390	Data & Computer Communications	4	3	3

GENERAL EDUCATION COURSES: 51 CREDITS

MA240	Calculus I	4	3	0
MA250	Calculus II	4	4	0
MA260	Multivariable Calculus	4	4	0
MA270	Statistics	3	3	0
PH222	University Physics I	4	3	2
PH223	University Physics II	4	3	2
TS310/201	Chemistry or Environmental Science	3/4	3	2
BS311	Microeconomics	3	3	0
	OR			
BS325	Project Management	3	3	0
EN129/130	College Composition I	3	3	0
EN140	College Composition II	3	3	0
HU/SS	Social Science Elective	3	3	0
HU/SS	Social Science Elective	3	3	0
SS265	Exploring Ethical Issues	3	3	0

GENERAL ELECTIVE OPTIONS (3 CREDITS)

Course #	***Course***	***Credits***	***Lecture***	***Lab***
MA130	Pre-Calculus	3	3	0
ECE01	General Elective	4	3	3

Typical Course Sequence for Electrical Engineering (BS)

YEAR 1 SEMESTER 1

ECE101 Digital Electronics

EN129/130 College Composition I

ENS103 Intro to Engineering

MA130 Pre-Calculus

YEAR 1 SEMESTER 2

CT143 Intro to C++ Programming

ECE105 Circuit Theory I

EN140 College Composition II

MA240 Calculus I

YEAR 2 SEMESTER 3

ECE205 Circuit Theory II

HU/SS Social Science Elective

MA250 Calculus II

PH222 University Physics I

YEAR 2 SEMESTER 4

ECE206 Solid State Devices

ECE307 Power Systems I

HU/SS Social Science Elective

PH223 University Physics II

YEAR 3 SEMESTER 5

ECE308 Power Systems II

ECE 311 Embedded Systems

ENS202 Engineering Technical Communication

MA260 Multivariable Calculus

YEAR 3 SEMESTER 6

BS325/311 Project Management or Microeconomics

ECE225 Linear Systems with Differential Equations

ECE403 Electromagnetic Theory

ECE414 Engineering Senior Project I

ECE 325 Statistics for Electrical Engineers

YEAR 4 SEMESTER 7

CM120 Intro to AutoCAD

ECE325L Statistics for Engineers Lab

ECE335 Control Systems

ECE430 Digital Signal Processing

TS310/201 General Chemistry or Environmental Science

YEAR 4 SEMESTER 8

ECE ECE elective

ECE410 Communication Systems

ECE415 Engineering Senior Project II

SS Ethics

Engineering Technology

The Department of Engineering Technology offers three short-term stackable certificate programs (Industrial Electronics Technology Certificate, CAD with Solidworks Certificate and CNC Machining Certificate) and three Associate of Science degree programs (Mechatronics Technology, Renewable Energy Technology and Manufacturing and Automation Engineering Technology). The department offers two flexible and stackable pathways from Certificate to Associate of Science Degree Programs (Electronics Cert. to A. S. in Mechatronics Engineering Technology; CNC Machining Cert. to A. S. in Manufacturing and Automation Engineering Technology). The Renewable Energy Technology concentration prepares the students for careers in the solar energy, wind energy and energy storage industries. The Mechatronics Technology and Manufacturing and Automation Engineering Technology pathways will prepare students to be employed in the areas of Electronics engineering, Mechanical design engineering and Robotics/Automation engineering technology.

Apart from offering a career-focused training curriculums in each of the concentrations, the Engineering Technology program prepares the students to build a profile that is suitable for a wide range of advanced career pathways leading to various engineering technician positions, project management positions, and technologist positions.

CAD with SolidWorks (Certificate)

The Engineering Technology department offers a short-term (8 months) Certificate in Mechanical Computer Aided Design (CAD). This program prepares students for entry level positions in the Mechanical drafting and designing field and consists of 5 core courses. The curriculum prepares the students to attain competencies that are most applicable to manufacturing processes, drafting, and utilizing software tools to assist machinists, mechanical designers, engineering research technicians, mechanical engineers, industrial automation technicians etc.

Outcomes

Upon successful completion of the certificate program in CAD with Solidworks, the graduate will be able to:

- Utilize SolidWorks to produce engineering part models, drawings, assemblies and to analyze interference fits and tolerances.
- Understand manufacturing processes and their uses in industry.
- Design and build products and equipment for a changing technical environment.
- Demonstrate a knowledge of mathematics and the ability to apply this knowledge as practiced in materials science, engineering mechanics (statics) and thermodynamics.
- Effectively communicate technical observations, results, issues and successes in both oral and written form.
- Demonstrate the fundamental skills necessary for continuing their education towards an associates or bachelors degree in mechanical engineering technology or related fields.

Faculty

Dr. Kamyar Pashayi

Mr. Wallace Scott

Degree Requirements for CAD with Solidworks (Certificate) 16 Credits

TECHNICAL COURSES: 13 CREDITS

Course #	***Course***	***Credits***	***Lecture***	***Lab***
ME101	Introduction to CAD Tools	3	3	0
ME105	CAD with SolidWorks	3	2	2
ME106	Advanced CAD with Solidworks	3	2	2
ME240	Machine Design	4	3	2

GENERAL EDUCATION: 3 CREDITS

MA120	Algebra and Trigonometry	3	3	0

Typical Course Sequence for CAD with Solidworks (Certificate)Track

SEMESTER 1

First 7 Weeks

ME 105 CAD with SolidWorks

Second 7 Weeks

ME 106 Advanced CAD with Solidworks

14 Weeks

MA120 Algebra and Trigonometry

ME101 Introduction to CAD Tools

SEMESTER 2

Session 1

ME240 Machine Design with SolidWorks

CNC Machining (Certificate)

The Engineering Technology department offers a short-term (8 months) Certificate in CNC Machining. The objective of the certificate program is to prepare its graduates for immediate employment as machining technicians. This curriculum prepares and trains students with industry aligned competencies for entry level positions that can support machinists, Mechanical Designers and Mechanical Engineers. The program includes fundamental courses in industry relevant topics such manufacturing processes, mechanical computer aided design and drafting, CNC machine programming and manufacturing & prototyping processes. All credits earned in this certificate program are eligible for transfer towards the Associates in Science in Manufacturing and Automation Engineering Technology degree track at Franklin Cummings Tech.

Facilities

The Engineering Technology Department maintains the following facilities to provide a hands-on learning environment to the students.

- CAD classroom with access to various CAD software packages such as SolidWorks, AutoDesk Fusion 360, OnShape, etc.
- Machine Shop with CNC Lathes, CNC Mills and an assortment of hand tools and measuring equipment
- Advanced Manufacturing Lab with CNC Plasma cutter, CNC Laser cutter and 3D printers
- Industrial Automation Lab with FANUC industrial and training robots

Outcomes

Upon successful completion of the Associate Degree in Manufacturing and Automation Engineering Technology, the graduate will be able to:

- Utilize SolidWorks to produce engineering part models, drawings, assemblies and to analyze interference fits and tolerances.
- Program and operate CNC equipment in an industrial environment.
- Understand manufacturing processes and their uses in industry.
- Effectively communicate technical observations, results, issues and successes in both oral and written form.
- Demonstrate the fundamental skills necessary for continuing their education towards a bachelor's degree in mechanical engineering technology or related fields.
- Understand professional, ethical and social responsibilities.

Faculty

Mr. Roy Garber
Dr. Kamyar Pashayi
Mr. Wallace Scott

Degree Requirements CNC Machining (Certificate) 26 Credits

TECHNICAL COURSES: 26 CREDITS

Course #	Course	Credits	Lecture	Lab
ME105	CAD with SolidWorks	3	2	2
ME106	Advanced CAD with Solidworks	3	2	2
ME150	Introduction to Manufacturing	4	2	4
ME151	Manufacturing Processes and CNC Machining	4	2	4
ME220	MasterCam Milling I	4	2	4
ME225	MasterCam Milling II	4	2	4
ME250	Advanced Manufacturing and CNC Processing	4	2	4

Typical Course Sequence for CNC Machining (Certificate) Track

SEMESTER 1

Session 1

ME105 CAD with SolidWorks

ME150 Introduction to Manufacturing

Session 2

ME106 Advanced CAD with Solidworks

ME151 Manufacturing Processes and CNC Machining

SEMESTER 2

First 7 Weeks

ME220 MasterCam Milling I

Second 7 Weeks

ME225 MasterCam Milling II

14 Weeks

ME250 Advanced Manufacturing and CNC Processing

Industrial Electronics Technology (Certificate)

The Engineering Technology department offers a short-term (8 months) Certificate in Industrial Electronics Technology program that focuses on teaching skills required for entry-level positions such as Electronics Technician, Electronics Assembler, Field/Maintenance Technician, Solder Technician among other positions. The curriculum is designed to train students in core competencies aligned with the industry requirements which include circuit analysis, circuit simulation/troubleshooting, device-level assembly, testing, soldering, data collection/analysis, diagnostics, calibration, maintenance, and basic programming. All credits earned in this certificate track are transferrable to the Associate of Science in Mechatronics Engineering Technology with further pathway towards Electrical Engineering bachelors degree program.

Facilities

The students in this track will primarily build their competencies using equipment in engineering technology laboratories. The labs are equipped to provide the students a hands-on learning experience in various aspects of Industrial Electronics Technology workforce related competencies such as breadboarding, testing, schematic capture, and simulation of analog and digital circuits. Students will typically spend six hours a week or more in the laboratory to procure industry specific hands-on competencies. Students follow the laboratory experiments with a report where the results are analyzed and discussed.

Outcomes

By the time of graduation, the Industrial Electronics Technology certificate graduate will be able to:

- Analyze or troubleshoot in three major electronic engineering areas: analog circuits, digital circuits, and processors.
- Recognize and apply fundamental knowledge of mathematics, especially algebra and trigonometry.
- Conduct experiments in teams, building or breadboarding, using basic test equipment and tools to measure performance, and to critically analyze and interpret data.
- Effectively communicate either technical observations, results, issues, and successes or negotiate a change in design or procedure.
- Apply computer skills for preparing technical documents or analyzing data: using applications for word processing, spreadsheets, simple programming, schematic capture, and simulation.
- Read manuals and schematics and identify components on a printed wiring board.

Faculty

Program Chair: Dr. Kamyar Pashayi

Instructor staff: Prof. Mozhgan Hosseinpour, Dr. Nikhil Satyala, Mr. Melvin Lugo Alvarez

Degree Requirements for Industrial Electronics Technology certificate - 23 Credits

TECHNICAL COURSES: 24 CREDITS

Course #	***Course***	***Credits***	***Lecture***	***Lab***
CT143	Introduction to Programming Logic and C++	4	3	2
EE105	Introduction to Electricity	4	3	2
EE122	Electronics I	4	3	2
EE131	Digital Principles	4	3	2
EE210	Introduction to Robotics	4	3	2

GENERAL EDUCATION COURSES: 3 CREDITS

MA120	Algebra and Trigonometry	3	3	0

Typical Course Sequence for Industrial Electronics Technology Certificate

SEMESTER 1

FIRST 7 WEEKS

EE105 Introduction to Electricity

EE131 Digital Principles

EE122 Electronics I

SECOND 7 WEEKS

14 Weeks

MA120 College Algebra and Trigonometry

EE105 Introduction to Electricity

SEMESTER 2

SESSION 1

CT143 Introduction to Programming Logic and C++

EE210 Introduction to Robotics

Engineering Technology - Manufacturing and Automation Concentration (AS)

The objective of the Engineering Technology - Manufacturing and Automation Concentration program is to prepare its graduates both for immediate employment as technicians and for further study at the bachelors level in related fields such as Mechanical Engineering Technology, Industrial Engineering, Engineering Design Technology.

This program maintains a close connection with industry. Its Industry Advisory Committee, consisting of professionals from the fields of manufacturing, industrial automation and mechanical engineering technology in Greater Boston and New England meets periodically to evaluate the objectives, curriculum and course content to keep the program updated and practical.

With a strong foundation in manufacturing processes, CAD and automation, graduates of the Advanced Manufacturing and Automation program are prepared for employment as Machinists, Assistant Mechanical Designers, Engineering Research Technicians, Assistant Mechanical Engineers, Industrial Automation Technicians, Engineering Representatives, etc.

Curriculum

The Engineering Technology - Manufacturing and Automation Concentration program includes fundamental and advanced courses in industry relevant topics such as Mechanical CAD, Machine design using CAD, Manufacturing processes, CNC machine programming, Rapid Manufacturing & Prototyping processes and Industrial Automation using Robotics and PLCs. The program also includes foundational courses in mathematics, statics and materials.

Humanities, social sciences, and English courses comprise part of the curriculum to ensure the graduates possess broader social visions and proficient and effective communication skills.

All Franklin Cummings Tech students are required to successfully complete a Career Success Seminar course prior to graduation. Typically, students are enrolled in this course for the semester prior to graduation. Please note this course may be added to a student's course load after the registration process, and thus may not be visible on a student's schedule until a few weeks prior to their final semester.

Facilities

The Engineering Technology Manufacturing and Automation Concentration Department maintains the following facilities to provide a hands-on learning environment to the students.

- CAD classroom with access to various CAD software packages such as SolidWorks, AutoDesk Fusion 360, OnShape, etc.
- Machine Shop with CNC Lathes, CNC Mills and an assortment of hand tools and measuring equipment
- Advanced Manufacturing Lab with CNC Plasma cutter, CNC Laser cutter and 3D printers
- Industrial Automation Lab with FANUC industrial and training robots

Outcomes

Upon successful completion of the Associate Degree in The Engineering Technology Manufacturing and Automation Concentration, the graduate will be able to:

- Utilize SolidWorks to produce engineering part models, drawings, assemblies and to analyze interference fits and tolerances.
- Program and operate CNC equipment in an industrial environment.
- Program and maintain Industrial Automation equipment.
- Manage and run rapid manufacturing machines such as 3D printers, Laser cutters and CNC Plasma cutters.
- Understand manufacturing processes and their uses in industry.
- Design and build products and equipment for a changing technical environment.
- Demonstrate a knowledge of mathematics and the ability to apply this knowledge as practiced in materials science, engineering mechanics (statics) and thermodynamics.
- Effectively communicate technical observations, results, issues and successes in both oral and written form.
- Demonstrate the fundamental skills necessary for continuing their education towards a bachelor's degree in mechanical engineering technology or related fields.
- Understand professional, ethical and social responsibilities.
- Work effectively in a team-oriented/project-focused work environment.

Faculty

Program Chair: Dr. Kamyar Pashayi

Instructor staff: Mr. Roy Garber, Mr. Wallace Scott, Mr. Melvin Lugo Alvarez, Prof. Mozhgan Hosseinpour, Dr. Nikhil Satyala

Degree Requirements for Engineering Technology - Manufacturing and Automation Concentration (AS) 67 Credits

TECHNICAL COURSES: 46 CREDITS

Course #	Course	Credits	Lecture	Lab
EE210	Introduction to Robotics	4	3	2
EE220	Industrial Robotics Systems.	4	3	2
EE225	Automation/Introduction to PLCs	4	3	2
ME105	CAD with SolidWorks.	3	2	2
ME106	Advanced CAD with Solidworks	3	2	2
ME150	Introduction to Manufacturing.	4	2	4
ME151	Manufacturing Processes and CNC Machining	4	2	4
ME220	MasterCam Milling I.	4	2	4
ME225	MasterCam Milling II	4	2	4
ME240	Machine Design	4	3	2
ME250	Advanced Manufacturing and CNC Processing	4	2	4
ME350	Rapid Manufacturing and Prototyping Processes	4	3	2

GENERAL EDUCATION COURSES: 21 CREDITS

EN129/130	College Composition I	3	3	0
EN140	College Composition II	3	3	0
EN320	Technical Communication	3	3	0
HU/SS	Social Science Elective	3	3	0
MA120	Algebra and Trigonometry	3	3	0
MA130	Pre-Calculus	3	3	0

BUSINESS ELECTIVE OPTIONS:

BS284	Operations Management	3	3	0
BS311	Microeconomics	3	3	0
BS312	Advanced Concepts in Information Literacy	3	3	0
BS325	Project Management	3	3	0

Typical Course Sequence for Manufacturing and Automation Engineering Technology (AS)

SEMESTER 1

First 7 Weeks

ME105 CAD with SolidWorks

ME150 Introduction to Manufacturing

Second 7 Weeks

ME106 Advanced CAD with Solidworks

ME151 Manufacturing Processes and CNC Machining

14 Weeks

MA120 Algebra and Trigonometry

SEMESTER 2

First 7 Weeks

ME220 MasterCam Milling I

Second 7 Weeks

ME225 MasterCam Milling II

14 Weeks

MA130 Pre-Calculus

ME250 Advanced Manufacturing and CNC Processing

SEMESTER 3

EN129/130 College Composition I

EN140 College Composition II

HU/SS Social Science Electives

SEMESTER 4

EE210 Introduction to Robotics

EN320 Technical Communication

ME240 Machine Design

SEMESTER 5

BS Business Elective

EE220 Industrial Robotics, Systems

EE225 Automation/Introduction to PLCs

ME350 Rapid Manufacturing and Prototyping Processes

Engineering Technology - Building Energy Management Concentration (AS)

Program overview

This program is a pathway program offered as a concentration in engineering technology. Students who plan to attain the Associate of Science in Engineering Technology with a concentration in Building Energy Management are required to complete the HVAC certificate before enrolling in this program. All credits from the HVAC Certificate are eligible for transfer to this Associate of Science degree program.

This associate degree program will prepare students to work as entry-level technicians focused on installing, programming, and maintaining the high-tech systems that control the heating, ventilation, air conditioning, and lighting in commercial, industrial, or residential buildings. Booming construction and the shift toward new green building technologies are expected to generate over 38,000 new technician job openings a year for the next decade, according to the US Bureau of Labor Statistics.

FC Tech's Associate of Science in Engineering Technology - Building Energy Management Concentration combines lectures with hands-on lab experiences to teach students the technical and project management skills they need to oversee the complex electrical, mechanical, energy, and computer-based control systems in today's buildings.

Credits from this program will be eligible for transfer into a related bachelor's degree program.

Learning outcomes and careers

Students who graduate from this program will be able to:

- Configure, install and operate computerized building environment control equipment.
- Procure basic knowledge in theoretical and experimental concepts of commercial HVAC systems.
- Develop the necessary theoretical and practical technical competencies to efficiently analyze and troubleshoot HVAC systems for large buildings and advanced large-scale environments.
- Understand building codes and compliance policies; follow general practices for efficient implementation of building control systems.
- Evaluate and analyze performance metrics; understand the importance of proper documentation practices.
- Assemble, perform diagnosis and create operational sequences for electrical and mechanical systems.
- Understand the environmental and economic impacts of energy efficient building systems.
- Generate technical reports and perform basic data analysis.

Requirements for Building Energy Management Concentration (AS): 69 Credits

HVAC&R TECHNOLOGY 28 CREDITS

TRANSFER CREDITS : 28 CREDITS

Course #	Course	Credits
HV100	Fundamentals of Electricity as applied to HVAC-R Refrigeration Fundamentals Electrical and Mechanical for Refrigeration	13
HV150	EPA - Refrigerant Recovery, Recycle, and Reclaim	2
HV200	Commercial Refrigeration and Ice Machines Commercial Air Conditioning and Heat PumpsGas Heating and Residential Air Conditioning Oil Furnaces and Hydronic Heating.	13

TECHNICAL COURSES : 48 CREDITS

Course #	Course	Credits	Lecture	Lab
BE202	Building Automation Systems & Controls	4	3	2
BE210	HVAC-R/BAS LAB	2	0	4
BE212	BAS Installation and Maitenance	4	3	2
ME130	Introduction to Alternative Energy Systems	3	3	0
EE225	Introduction to PLCs/ Automation	3	2	2
CT160	Networking	4	3	2
General Education Courses : 21 Credits				
EN130	College Composition	3	3	0
EN140	College Composition II	3	3	0
EN320	Technical Communications	3	3	0
MA120	Algebra and Trigonometry	3	3	0
HU/SS	HU/SS General Elective	3	3	0
HU/SS	HU/SS General Elective	3	3	0
HU/SS	HU/SS General Elective	3	3	0

Typical Course Sequence for Building Energy Management Concentration (AS)

SEMESTER 1

HU/SS General Elective

EN130 College Composition I

HU/SS General Elective

SEMESTER2

BE202 Building Automation Systems and Controls

BE210 HVAC-R/BAS Lab

CT160 Networking

EN320 Technical Communications

MA120 Algebra and Trigonometry

SEMESTER 3

ME130 Intro to Alternative Energy Systems

EE225 Introduction to PLCs/ Automation

BE212 BAS Installation and Maintenance

EN140 College Composition II

HU/SS General Elective

Engineering Technology - Mechatronics Technology (*AS*)

The Mechatronics Technology concentration is a hybrid combination of Electronics/Robotics Engineering Technology and Mechanical Engineering Technology that is primarily focused on developing hardware and software level competencies aligned with the current industry needs in the areas of electronics, mechanical and robotics systems. This hands-on learning-based program aims at workforce development through training in the design, installation, maintenance, and repair of high-tech electronics, automation, and manufacturing systems. This program maintains a close connection with the industry. Its Industry Advisory Committee, consisting of electronics, mechanical engineering and robotics engineering technology professionals in Greater Boston and New England, meets periodically to evaluate the objectives, curriculum, and course content, to keep the program updated and practical.

Graduates are mechatronics or electromechanical technicians that may perform a broad range of tasks for high tech companies in the electronics components, robotics, automation, industrial control, instrumentation, and defense sectors. A mechatronics technician generally works under the supervision of engineers and may support design engineers developing a new product by assembling prototypes and testing them to verify their operation. Or the technician may be in the manufacturing department where he/she builds, tests and repairs high tech products. They also may repair customer products, provide technical support to customers, or assist the sales organization with technical support. Technicians are hands-on practitioners who know how to apply algebra and trigonometry to real-life problems or run computer simulations to analyze circuits.

To advance in these careers, it is also important to develop skills in communicating the problems, ideas and solutions to others in the company. Those graduates in departments that interface with customers must also develop people skills. Many graduates choose to continue their education and are accepted into Electronic Engineering Technology, Mechanical Engineering Technology or Electrical Engineering programs leading to the Bachelor of Science degree. Alternatively, a graduate could choose to pursue a degree in business, acquiring both technical and business skills. Franklin Cummings Tech also offers a direct pathway with a transferrable credit option from the Associate degree track in Mechatronics Engineering Technology to the Bachelors degree program in Electrical engineering.

Curriculum

The curriculum is structured to provide a broad education, with students taking courses in each of the recognized areas of AC/DC circuits, mechanical CAD, manufacturing systems, programmable logic controllers, articulated robot programming, writing skills, presentation skills, algebra, trigonometry, elementary calculus, computer application, computer programming, and problem-solving skills. Typically, the introductory courses in electronics and mechanical engineering technology consist of three hours of lecture and two hours of laboratory work, reinforcing concepts and principles taught in the classroom and providing extensive hands-on education. All Franklin Cummings Tech students are required to successfully complete a Career Success Seminar course prior to graduation. Typically, Mechatronics students are enrolled in this course for the semester prior to graduation. Please note this course, may be added to a student's course load after the registration process, and thus may not be visible on a student's schedule until a few weeks prior to their final semester.

Facilities

The students in this track will primarily build their competencies using equipment in three laboratories: electronics laboratory, mechanical CAD laboratory and robotics laboratory. The labs are equipped to provide students ample and meaningful hands-on experience in breadboarding, testing, schematic capture, and simulation of analog and digital circuits. The students will make use of the CAD lab and manufacturing systems equipment for the courses in mechanical CAD and manufacturing. The robotics and automation laboratory is equipped with state-of-art articulated robots and programmable logic controllers. Students will typically spend six hours a week or more in the laboratory to procure industry specific hands-on competencies. Students follow the laboratory experiments with a report where the results are analyzed and discussed.

Outcomes

By the time of graduation, the Engineering Technology - Mechatronics Technology graduate will be able to:

- Operate, analyze, or troubleshoot in three major technology areas: electronic circuits, mechanical equipment, and robotics/automation systems.
- Recognize and apply fundamental knowledge of mathematics, especially algebra and trigonometry.
- Conduct experiments in teams, building or breadboarding, using basic test equipment and tools to measure performance, and to critically analyze and interpret data.
- Read manuals and schematics and identify components on a printed wiring board.
- Effectively communicate either technical observations, results, issues, and successes or negotiate a change in design or procedure.
- Utilize computer aided design software to produce engineering drawings and to analyze interference fits and tolerances.
- Understand manufacturing processes and their uses in industry.

Faculty

Dr. Nikhil Satyala, Prof. Mozhgan Hosseinpour, Mr. Melvin Lugo Alvarez

Degree Requirements for Mechatronics Technology (AS) 68 Credits

TECHNICAL COURSES: 43 CREDITS

Course #	***Course***	***Credits***	***Lecture***	***Lab***
CT143	Introduction to Programming Logic and C++	4	3	2
EE101	Motors and Controls	4	3	2
EE105	Introduction to Electricity	4	3	2
EE122	Electronics I	4	3	2
EE131	Digital Principles	4	3	2
EE210	Introduction to Robotics	4	3	2
EE220	Industrial Robotics Systems	4	4	2
EE223	Electronics II	4	3	2
EE225	Automation/Introduction to PLCs	4	4	2
ME105	CAD with SolidWorks	3	2	2
ME150	Introduction to Manufacturing	4	2	4

GENERAL EDUCATION COURSES: 25 CREDITS

BS	Business Elective	3	3	0
EN129/130	College Composition I	3	3	0
EN140	College Composition II	3	3	0
EN320	Technical Communications	3	3	0
HU/SS	Social Science Elective	3	3	0
MA120	Algebra and Trigonometry	3	3	0
MA130	Pre-Calculus	3	3	0
PH212	Physics I	4	3	2

BUSINESS ELECTIVE OPTIONS:

BS284	Operations Management	3	3	0
BS311	Microeconomics	3	3	0
BS312	Advanced Concepts in Information Literacy	3	3	0
BS325	Project Management	3	3	0

Typical Course Sequence for Mechatronics Technology (AS) Track

SEMESTER 1

EE105 Introduction to Electricity
EE122 Electronics I
EE131 Digital Principles
MA120 Algebra and Trigonometry

SEMESTER 2

CT143 Intro to C++ Programming
EE101 Motors and Controls
EE210 Introduction To Robotics
MA130 Pre-Calculus

SEMESTER 3

EN129/130 College Comp I
EN140 College Comp II
HU/SS Social Science Elective

SEMESTER 4

EE223 Electronics II
EN320 Technical Communication
ME105 CAD with SolidWorks
ME150 Intro to Manufacturing

SEMESTER 5

BS Business Elective
EE220 Industrial Robotics Systems
EE225 Automation/Intro to PLCs
PH212 Physics I

Engineering Technology - Renewable Energy Technology Concentration (AS)

The Engineering Technology - Renewable Energy Technology Concentration program aims to prepare and train students in a range of skills required for the pertinent career options including but not limited to Solar Photovoltaic Installer/Technician, Wind Turbine Technician, and Renewable Energy Engineering Technician. An Associates degree in this field of provides the necessary skill set for students to pursue a typical entry-level technician position focused on operation, assembly, installation, troubleshooting and maintenance of energy harvesting systems and equipment. This program aims at workforce development through hands-on training to develop industry specific competencies. Its Industry Advisory Committee, consisting of renewable energy engineering, environmental engineering, electronics engineering and mechanical engineering technology professionals in Greater Boston and New England, meets periodically to evaluate the objectives, curriculum, and course content, to keep the program updated and practical.

Curriculum

The Engineering Technology - Renewable Energy Technology Concentration track addresses the key job requirements by providing courses that cover both theoretical knowledge and laboratory-based experience in various aspects of energy harvesting systems. Through this curriculum students will learn about the importance of performance analytics and technical know-how necessary for supporting the cost-effective energy production methods in the industry. Gaining knowledge of power generation techniques and sustainable building technologies will be a plus for students to make them marketable for a wide range of jobs and multiple career paths. The curriculum is designed to teach and train the students in the technical, analytical, and general education areas necessary to procure such entry-level technician position. Students will not only learn about the importance of mechanisms and technical methodologies but also develop the hands-on skills necessary to support the cost-effective energy production methods as future technicians in the power generation industry.

Facilities

The students in this track will primarily build their competencies using equipment in the renewable energy laboratory, electronics laboratory, and robotics laboratory (automation). The labs are equipped with state-of-art training instruments to provide industry specific hands-on experience in integration, assembly, installation, maintenance and troubleshooting of small-scale solar/photovoltaic and wind turbine systems. The students will make use of the electronics laboratory to learn fundamentals of AC/DC circuits and concepts of electricity. The robotics and automation laboratory will be utilized to teach programmable logic controller-based skills. Students will typically spend six hours a week or more in the laboratory to procure industry specific hands-on competencies. Students follow the laboratory experiments with a report where the results are analyzed and discussed.

Outcomes

By the time of graduation, the Engineering Technology - Renewable Energy Technology Concentration graduate will be able to:

- Be able to understand the benefits, strengths, limitations and environmental impacts of renewable energy and sustainable energy resources
- Procure basic knowledge in fundamentals of electricity, power, circuit level schematics and control systems
- Acquire basic knowledge of integration, assembly, installation, maintenance and troubleshooting of small-scale solar/photovoltaic and wind turbine systems
- Develop the necessary theoretical and practical technical competencies to efficiently perform energy harvesting, energy storage and maintenance related operations
- Develop an understanding of basic mechanisms and dynamics of clean energy harvesting, power generation, energy conversion, and sustainable building technologies
- Be able to evaluate and analyze performance metrics of various small-scale photovoltaic systems and wind turbine systems.
- Acquire fundamental knowledge in project management methods and ethical issues in technical industries
- Be able to understand the environmental and economic impacts of renewable energy systems
- Posses the skills to generate technical reports and perform basic data analysis

Faculty

Dr. Nikhil Satyala, Prof. Mozhgan Hosseinpour, Mr. Melvin Lugo Alvarez

Degree Requirements for Renewable Energy Technology (AS) 69 Credits

TECHNICAL COURSES: 39 or 40 CREDITS

Course #	Course	Credits	Lecture	Lab
EE101	Motors and Controls	4	3	2
EE105	Introduction to Electricity	4	3	2
EE131	Digital Principles	4	3	2
EE225	Automation/Introduction to PLCs	4	3	2
EE225 or one of the following (ME201, ME232) Technical Elective				
Technical Electives:				
ME201	Working in the Battery Industry	3	3	0
ME232	General Industry Safety Training	3	3	0
ME130	Intro to Alternative Energy Systems	3	3	0
ME205	Solar Energy and Photovoltaics	4	3	2
ME210	Sustainability and Energy Efficiency	3	3	0
ME215	Wind Turbine Technology	4	3	2
ME235	Modeling Renewable Energy	3	3	0
ME235 or one of the following (ME201, ME232) Technical Elective				
Technical Electives:				
ME201	Working in the Battery Industry	3	3	0
ME232	General Industry Safety Training	3	3	0
ME252	Thermodynamics	4	3	2
TS201	Environmental Science	3	3	0

GENERAL EDUCATION AND BUSINESS COURSES: 26 CREDITS

MA120	Algebra and Trigonometry	3	3	0
MA130	Pre-Calculus	3	3	0
EN129/130	College Composition I	3	3	0
EN140	College Composition II	3	3	0
PH212	Physics I	4	2	3
PH213	Physics II	4	3	2
EN320	Technical Communications	3	3	0

BUSINESS ELECTIVE OPTIONS:

BS284	Operations Management	3	3	0
BS311	Microeconomics	3	3	0
BS312	Advanced Concepts in Information Literacy	3	3	0
BS325	Project Management	3	3	0

Typical Course Sequence for Renewable Energy Technology (AS) Concentration

SEMESTER 1

- EE105 Intro to Electricity
- EE131 Digital Principles
- EN129/130 College Comp I
- MA120 Algebra and Trigonometry
- ME130 Intro to Alternative Energy Systems

SEMESTER 2

- BS Business Elective
- EE101 Motors and Controls
- EN140 College Comp II
- MA130 Pre-Calculus
- ME205 Solar Energy and Photovoltaics

SEMESTER 3

- ME210 Sustainability and Energy Efficiency
- ME252 Thermodynamics
- PH212 Physics I
- TS201 Environmental Science

SEMESTER 4

- EE225 Automation/Intro to PLCs
- EN320 Technical Communication
- ME215 Wind Turbine Technology
- ME235 Modeling Renewable Energy
- PH213 Physics II

Health Information Technology (AS)

Health Information Technology (Health IT) is improving patient outcomes and reducing costs in 21st century medicine. Health IT the hardware and software, policies, and procedures that enable the digitization, storage, and the secure exchange of health information among various clinicians across networks and web services within hospitals and other healthcare settings, including the public health agencies, to achieve better healthcare outcomes.

The old fashioned paper chart has been replaced by the electronic health records (EHR); however, usability and interoperability challenges remain. The Health IT program prepares graduates to build, implement, and maintain computerized health information systems, insure the reliability and security of patient records, clinicians need to work with to improve the quality of patient care and reduce costs. Health IT grads know the guidelines and practices for these systems and have the ability to operate within industry-wide regulations and standards for healthcare information. Individuals with the right combination of IT skills and knowledge of healthcare language and clinical practices are in high demand in medical and public health settings. The program is based on an interdisciplinary curriculum that is aligned with the multiple skillsets hiring organizations are looking for. With this in mind, students are taught not only technology skills, but also critical thinking skills, communication (oral and written), facilitation, teamwork skills, as well as a solid knowledge of the medical language, regulations, and practices. Because of these features, the program will appeal not only to first-time college students, but also to adults with credits or experience in related fields.

Curriculum

The Associate of Science (AS) degree in Health Information Technology (Health IT) provides graduates with healthcare-related knowledge and skills grounded in knowledge from computer technology. Students will also refine their ability to communicate, establish a foundation in math and science, and develop civic and ethical awareness. The program includes three groups of coursework: healthcare, computer technology, and general education. The coursework is all drawn from Franklin Cummings Tech's bachelor's program in Health Information Technology.

The healthcare group of courses provides a foundation in healthcare systems and vocabulary, health information technology, and information security. The computer technology courses provide sufficient exposure and training to give graduates a strong foundation in the information technology that supports healthcare systems. These courses include instruction in the fundamentals of operating systems, computer programming, database management and networking. General education courses provide a foundation in communications, critical thinking, mathematics, and science for learning and practice in health information technology and will also provide substantial development of the institutional values we expect in all Franklin Cummings Tech graduates. The Associate of Science in Health Information Technology prepares graduates for immediate employment in technical support for healthcare providers and others who rely on Health IT systems. For students interested in additional training and education, the AS in Health IT can serve as excellent preparation for transfer to a Bachelor of Science program in Health Information Technology or Health Information Management. In addition to the Associate of Science in Heath Information Technology, the College offers a Bachelor of Science in Heath Information Technology, and two tracks within it: Public health and Data Analytics Tracks. Their curricula are discussed below.

Facilities

For in-person courses, the College has more than 72 computer workstations in four classroom laboratory settings, virtual and "sandboxed" environments equipped with servers, workstations and networking equipment for hands-on server administration and data communications courses, and a computer diagnostics laboratory.

All computer rooms are equipped with up-to-date software and multi-boot capability, where necessary, to provide all students with hands-on computer programming, installation, server administration and networking capabilities for their learning. The computer diagnostics laboratory provides the students with the necessary equipment to perform hardware and software troubleshooting.

For online courses, the College provides the Canvas Learning Management System as the main platform to ensure all course materials such as syllabi, assignments, discussions, quizzes, projects are posted online and easily accessible to students. In addition, with the COVID-19 crisis, the teachers use the Zoon videoconference platform to deliver their lectures to explain the concepts and contextualize them to create community.

Outcomes

Upon successful completion of the Associate Degree in Health IT, the graduate will be able to:

- Design and develop entry-level database application systems.
- Employ hardware/software knowledge to configure, install, support, and maintain computer and network systems.
- Install, maintain, and administer various operating systems, including Office 365.
- Design and develop websites using contemporary web design software.
- Apply knowledge of healthcare concepts and terminology to assist users of computerized information storage and retrieval systems.
- Effectively communicate technical observations, results, issues, and successes, in both speaking and writing.
- Explain the importance of Health IT concepts such as meaningful use, health information exchange, and clinical decision support.
- Observe administrative, legal, and medical constraints and rules in the implementation and use of HIT systems.
- Provide entry-level computer programming and scripting to maintain and improve HIT systems.
- Recognize the need for and develop the ability to engage in lifelong learning.
- Understand mathematics at the level of college algebra and pre-calculus and apply this knowledge to solve Health IT related problems.
- Understand professional, ethical, and social responsibilities.
- Use scientific knowledge, including basic principles of physiology, to guide work in Health IT.

Faculty

Program Chair: Dr. Gerald Elysee

Instructor staff: Gerald Elysee, Karen Newkirk, Afshan Kirmani, Tammy Chu, Cheryl Dorsey, Kristi J. Reed

Degree Requirements for Health Information Technology (AS) 65 Credits

CORE TECHNICAL COURSES: 43 CREDITS

Course #	Course	Credits	Lecture	Lab
CT140	Google IT support Certificate Program	6	4	4
CT165	Introduction to Networking	3	2	2
CT221	Enterprise Database Management	3	2	2
CT269	Cloud Computing and Virtualization Fundamentals	4	3	2
CT365	Network Security	4	3	2
HI110	US Healthcare Fundamentals	3	3	0
HI120	Medical Terminology	3	3	0
HI130	Introduction to Health Information Technology	4	3	2
HI210	Health IS Implementation and Workflow Analysis	4	3	2
HI310	Medical Coding, Classification and Communication	4	3	2
HI330	Introduction to Healthcare Databases	4	3	2

CORE GENERAL EDUCATION COURSES: 22 CREDITS

Required General Education Courses: 16 Credits

Course #	Course	Credits	Lecture	Lab
EN129/130	College Composition I	3	3	0
EN140	College Composition II	3	3	0
HU/SS	Social Science Elective	3	3	0
HU/SS	Social Science Elective	3	3	0
TS240	Human Anatomy and Physiology	4	3	2

MATH REQUIREMENT OPTIONS: 6 CREDITS

Course #	Course	Credits	Lecture	Lab
MA105	Technical Mathematics	3	3	0
MA120	College Algebra and Trigonometry	3	3	0
MA130	Pre-Calculus	3	3	0
MA240	Calculus I	4	4	0
MA250	Calculus II	4	4	0

Typical Course Sequence for Health Information Technology (AS)

SEMESTER 1

- CT140 Google IT support Certificate Program
- EN129/130 College Composition I
- HI110 US Healthcare Fundamentals
- MAE1 Math Elective

SEMESTER 2

- CT221 Enterprise Database Management
- EN140 College Composition II
- HI120 Medical Terminology
- HI130 Intro to Health IT
- MAE2 Math Elective

SEMESTER 3

- CT165 Introduction to Networking
- HI330 Healthcare Databases
- HI210 Health IS Implementation
- HU/SS Social Science Elective
- TS240 Human Anatomy & Physiology

SEMESTER 4

- CT269 Cloud Computing and Virtualization
- CT365 Network Security
- HI310 Medical Coding, Classification and Communication
- HU/SS Social Science Elective

Health Information Technology (BS)

Information Technology (Health IT) is the hardware and software, policies, and procedures that make possible the storage, retrieval, availability, and security of information essential to the success of healthcare organizations. Health IT is improving outcomes and reducing costs in 21st century medicine. Doctors have more information available sooner when making critical decisions about treatment, and patients are better able to understand and participate in those decisions. The Bachelor of Science in Health Information Technology program prepares graduates to work in entry-level positions ranging from clinical applications coordinator to health information systems professional at physicians' practices, healthcare agencies, hospitals, and public health agencies, or at the companies that create health information systems and keep them running. Within the program, the College now offers two tracks, Public Health and Data Analytics, which provide students with the knowledge and training for technical positions in state and local public health organizations, hospitals and other healthcare providers.

The old fashioned paper chart has been replaced by the electronic health record (EHR); however, usability and interoperability challenges remain. The program is based on an interdisciplinary curriculum that is aligned with the multiple skillsets hiring organizations are looking for. With this in mind, students are taught not only technology skills, but also critical thinking skills, communication (oral and written), management (people and projects), facilitation, teamwork skills, as well as a solid knowledge of the medical language, regulations, and practices. Because of these features, this program will appeal not only to first-time college students, but also to adults with credits or experience in related fields. Transfer students are welcome from the associate degree programs at Franklin Cummings Tech and other colleges.

Curriculum

Students in the program receive in-depth instruction in both healthcare and the latest information technology to support the healthcare industries. Courses in healthcare include introduction to healthcare systems, medical terminology, medical coding and classification, healthcare compliance and contemporary ethical and legal issues. Courses in computer technology focus on hands-on training enabled through simulation software in use of health databases, networking and information security. As part of the senior year, students will complete a workplace internship at a local medical facility, and a capstone project where they will engage in problem-based learning to tackle a challenge drawn from industry. Within the program, the College now offers two tracks: Public Health, and Data Analytics. Their curricula are discussed below.

Facilities

For in-person courses, the College has more than 72 computer workstations available to students in four classroom laboratory settings, virtual and "sandboxed" environments equipped with servers, workstations and networking equipment for hands-on server administration and data communications courses, and a computer diagnostics laboratory.

All computer rooms are equipped with up-to-date software and multi-boot capability, where necessary, to provide all students with hands-on computer programming, installation, server administration and networking capabilities for their learning. The computer diagnostics laboratory provides the students with the necessary equipment to perform hardware and software troubleshooting.

For online courses, the College provides the Canvas Learning Management System as the main platform to ensure all course materials such as syllabi, assignments, discussions, quizzes, projects are posted online and easily accessible to students. In addition, with the COVID-19 crisis, the teachers use the Zoon videoconference platform to deliver their lectures to explain the concepts and contextualize them to create community.

Outcomes

Upon successful completion of the Bachelor's Degree in Health IT, the graduate will be able to:

- Design and develop entry-level database application systems.
- Employ hardware/software knowledge to configure, install, support, and maintain computer and network systems.
- Install, maintain, and administer various operating systems, including Office 365.
- Design and develop websites using contemporary web design software.
- Administer computer, network and web services and security.
- Apply knowledge of healthcare concepts and terminology to the creation and maintenance of computerized information storage and retrieval systems.
- Apply Health IT communication standards, such as the HL7 messaging standard, to improve and maintain the interoperability of health information systems.
- Effectively communicate technical observations, results, issues, and successes, in both speaking and writing.
- Explain the importance of Health IT concepts such as meaningful use, health information exchange, and clinical decision support.
- Observe administrative, legal, and medical constraints and rules in the implementation and use of Health IT systems.
- Provide entry-level computer programming and scripting to maintain and improve Health IT systems.
- Recognize the need for and develop the ability to engage in lifelong learning.
- Understand mathematics, including statistics, and apply this knowledge to solve Health IT related problems.
- Evaluate different Health IT solutions, and as part of a capstone project, recommend the best one(s) that can effectively address identified problems facing the healthcare industry.
- Understand professional, ethical, and social responsibilities.
- Use scientific knowledge, including basic principles of physiology, to guide work in Health IT.
- Understand the duties and responsibilities assigned to Health IT specialists in a real-world healthcare setting.

Faculty

Program Chair: Dr. Gerald Elysee

Instructor staff: Gerald Elysee, Karen Newkirk, Tammy Chu, Cheryl Dorsey, Kristi J. Reed

HI, SS, and TS designated courses are taught by faculty identified above, while CT designated courses are taught by faculty identified in the Computer Technology program description

Typical Degree Requirements for Health Information Technology (BS) 120 Credits

CORE TECHNICAL COURSES: 74 CREDITS

Course #	Course	Credits	Lecture	Lab
CT140	Google IT support Certificate Program	6	4	4
CT165	Introduction to Networking	3	2	2
CT221	Enterprise Database Management	3	2	2
CT233	Windows System Administration	3	2	2
CT250	Fundamentals in Python	4	3	2
CT269	Cloud Computing and Virtualization Fundamentals	4	3	2
CT275	Agile Project Management	3	2	2
CT365	Network Security	4	3	2
HI110	US Healthcare Fundamentals	3	3	0
HI120	Medical Terminology	3	3	0
HI130	Introduction to Health Information Technology	4	3	2
HI210	Health IS Implementation and Workflow Analysis	4	3	2
HI300	Current Issues in Healthcare	3	3	0
HI310	Medical Coding, Classification and Communication	4	3	2
HI320	Legal and Ethical Issues in Health IT	3	3	0
HI330	Introduction to Healthcare Databases	4	3	2
HI410	Health Information Systems Integration	4	3	2
HI430	Healthcare Compliance	3	3	0
HI445	Professional Experience (Practicum)	4	3	2
HI490	Capstone Project	4	3	2

CORE GENERAL EDUCATION COURSES: 46 CREDITS

Required General Education Courses: 17 Credits

Course #	Course	Credits	Lecture	Lab
EN129/130	College Composition I	3	3	0
EN140	College Composition II	3	3	0
EN320	Technical Communication	3	3	0
MA270	Elementary Statistics	3	3	0
MA290	Topics in Healthcare Statistics	1	0	2
TS240	Human Anatomy and Physiology	4	3	2

MATH REQUIREMENT & ELECTIVE OPTIONS: 6 CREDITS

Course #	*Course*	*Credits*	*Lecture*	*Lab*
MA105	Technical Mathematics	3	3	0
MA120	College Algebra and Trigonometry	3	3	0
MA130	Pre-Calculus	3	3	0
MA240	Calculus I	4	4	0
MA250	Calculus II	4	4	0

GENERAL EDUCATION ELECTIVES: 11 CREDITS

Course #	*Course*	*Credits*	*Lecture*	*Lab*
MA130	Pre-Calculus	3	3	0
MA240	Calculus I	4	4	0
MA250	Calculus II	4	4	0
PH212	Physics I	4	2	3
PH213	Physics II	4	3	2
TS201	Environmental Science	3	3	0
TS242	Pathophysiology and Pharmacology	4	3	2

HU/SS SOCIAL SCIENCE ELECTIVES: 12 CREDITS

HU/SS	Social Science Elective 1	3	3	0
HU/SS	Social Science Elective 2	3	3	0
HU/SS	*Social Science Elective 3	3	3	0
HU/SS	*Social Science Elective 4	3	3	0

* HU/SS Social Science Electives (12 Credits): 6 Credits Must Be 300 Levels or Higher

Typical Course Sequence for Health Information Technology (BS): 4 Year Option, 120 Credits

YEAR 1 SEMESTER 1

CT140 Google IT Support Certificate Program

EN129/130 College Composition I

HI110 US Healthcare Fundamentals

MAE1 Math Elective

YEAR 1 SEMESTER 2

CT221 Enterprise Database Management

EN140 College Composition II

HI120 Medical Terminology

HI130 Intro to Health IT

MAE2 Math Elective

YEAR 2 SEMESTER 3

CT160 Networking

HI210 Health IS Implementation and Workflow Analysis

HI330 Intro to Healthcare Databases

HU/SS Social Science Elective

TS240 Human Anatomy & Physiology

YEAR 2 SEMESTER 4

CT269 Cloud Computing and Virtualization Fundamentals

CT365 Network Security

HI310 Medical Coding, Classification and Communication

HU/SS Social Science Elective

YEAR 3 SEMESTER 5

CT233 Windows System Administration

CT250 Fundamentals in Python

EN320 Technical Communication

HI300 Current Issues in Healthcare

YEAR 3 SEMESTER 6

CT275 Agile Project Management

HI320 Legal and Ethical Issues in Health IT

HU/SS Social Science Elective **300 Level or Higher*

GEE General Education Elective

YEAR 4 SEMESTER 7

HI430 Healthcare Compliance

HU/SS Social Science Elective **300 Level or Higher*

MA270/290 Elementary Statistics/Health Statistics

GEE General Education Elective

YEAR 4 SEMESTER 8

HI410 Health Information Systems Integration

HI445 Professional Experience

HI490 Capstone Project

GEE General Education Elective

In collaboration with the Lower Cost Models Consortium (LCMC) partners, a coalition of private colleges and universities, the College offers two tracks within the existing Health Information Technology Bachelor of Science program. They are the Public Health and Data Analytics tracks. Transfer students are welcome from the associate degree programs at Franklin Cummings Tech and other colleges.

Data Analytics

The Data Analytics track within the Health IT program at Franklin Cummings Tech equips students with the ability to scrape, clean, interpret, and present data within the context of healthcare. The large quantities of raw electronic data collected from various systems need to be validated, prepared, and analyzed to identify trends and patterns and draw actionable insights to inform decision making that can lead to the success of healthcare organizations. This continued growth in data generation creates significant demand for data analytics professionals with Health IT knowledge, techniques, and skills to use data to impact healthcare quality and costs. According to the US Bureau of Labor Statistics, Data Analytics-related jobs are among top 20 fastest growing occupations, and expected to grow by more than 25% from 2019 to 2029 (https://www.bls.gov/ooh/fastest-growing.htm). Graduates with a background in Data Analytics and Health IT have the ability to work in a variety of organizations that leverage data to better patient outcomes. Examples are hospitals, pharmaceutical and medical devices companies, private and public research institutions, and state & local public health departments. Transfer students are welcome from the associate degree programs at Franklin Cummings Tech and other colleges.

Outcomes

Upon successful completion of the Bachelor of Science in Health IT - Data Analytics track, all graduates will be able to:

- Design and develop entry-level database application systems.
- Design and develop websites using contemporary web design software.
- Apply knowledge of healthcare concepts and terminology to the creation and maintenance of computerized information storage and retrieval systems.
- Apply Health IT communication standards, such as the HL7 messaging standard, to improve and maintain the interoperability of health information systems.
- Observe administrative, legal, and medical constraints and rules in the implementation and use of Health IT systems.
- Provide entry-level computer programming and scripting to maintain and improve Health IT systems.
- Recognize the need for and develop the ability to engage in lifelong learning.
- Evaluate different healthcare solutions using Data Analytics, and as part of Data Analytics Practicum course recommend the best actions that can effectively address identified problems facing the Public Health domain.
- Evaluate and apply fundamental statistical concepts in the context of a broad range of data problems, including Bayes Theorem, common statistical tests and biases, inference and causal inference and hypothesis testing.
- Perform in-depth exploratory analysis to form hypotheses and use visualization techniques to communicate insights.
- Design experiments to answer causal questions and evaluate the results of the experiments.
- Apply and evaluate machine learning algorithms in a business problem context, with an emphasis on selecting predictive modelling only when appropriate.
- Perform feature engineering and data preprocessing in order to improve the accuracy and efficacy of predictive models.

Typical Degree Requirements for the Data Analytics Concentration In the Bachelor of Science (BS) in Health Information Technology Program (129 CREDITS)

CORE TECHNICAL COURSES: 87 CREDITS

Course #	Course	Credits	Lecture	Lab
CT108	Internet History Technology and Security*	3	2	2
CT114	Programming for Everyone I Using Python*	3	2	2
CT140	Google IT support Certificate Program	6	4	4
CT160	Networking	4	3	2
CT221	Enterprise Database Management	3	2	2
CT269	Cloud Computing and Virtualization Fundamentals	4	3	2
CT275	Agile Project Management	3	2	2
CT300	Data Structures	3	2	2
CT365	Network Security	4	3	2
DA105	Foundation of Data Analytics I Using Python	3	2	2
DA110	Foundation of Data Analytics II Using Python	3	2	2
DA301	Principles and Techniques of Data I	3	2	2
DA305	Principles and Techniques of Data Analytics II	3	2	2
HI110	US Healthcare Fundamentals	3	3	0
HI120	Medical Terminology	3	3	0
HI130	Introduction to Health Information Technology	4	3	2
HI210	Health IS Implementation and Workflow Analysis	4	3	2
HI300	Current Issues in Healthcare	3	3	0
HI310	Medical Coding, Classification and Communication	4	3	2
HI320	Legal and Ethical Issues in Health IT	3	3	0
HI330	Introduction to Healthcare Databases	4	3	2
HI410	Health Information Systems Integration	4	3	2
HI430	Healthcare Compliance	3	3	0
HI445	Professional Experience (Practicum)	4	3	2

CORE GENERAL EDUCATION COURSES: 42 CREDITS

Required General Education Courses: 24 Credits

EN129/130	College Composition I	3	3	0
EN140	College Composition II	3	3	0
EN320	Technical Communication	3	3	0
MA130	Pre-Calculus	3	3	0
MA240	Calculus I	4	4	0
MA270	Elementary Statistics	3	3	0
MA290	Topics in Healthcare Statistics	1	0	2
TS240	Human Anatomy and Physiology	4	3	2

MATH ELECTIVE OPTIONS: 6 CREDITS

Course #	Course	Credits	Lecture	Lab
MA105	Technical Mathematics	3	3	0
MA120	College Algebra and Trigonometry	3	3	0
MA250	Calculus II	4	4	0

HU/SS SOCIAL SCIENCE ELECTIVES: 12 CREDITS

HU/SS	Social Science Elective 1	3	3	0
HU/SS	Social Science Elective 2	3	3	0
HU/SS	Social Science Elective 3*	3	3	0
HU/SS	Social Science Elective 4*	3	3	0

* HU/SS Social Science Electives (12 Credits): 6 Credits Must Be 300 Levels or Higher

Typical Course Sequence for the Data Analytics Concentration in the Bachelor of Science (BS) in Health Information Technology Program (129 Credits)

YEAR 1 SEMESTER 1

CT140	Google IT Support Certificate Program
EN 129/130	College Composition I
HI110	US Healthcare Fundamentals
MAE1	Math Elective

YEAR 1 SEMESTER 2

CT221	Enterprise Database Management
EN140	College Composition II
HI120	Medical Terminology
HI130	Intro to Health IT
MAE2	Math Elective

YEAR 2 SEMESTER 3

CT160	Networking
HI210	Health IS Implementation
HI330	Healthcare Databases
HU/SS	Social Science Elective
TS240	Human Anatomy & Physiology

YEAR 2 SEMESTER 4

CT269	Cloud Computing and Virtualization
CT365	Network Security
HI310	Medical Coding, Classification and Communication
HU/SS	Social Science Elective

YEAR 3 SEMESTER 5

CT114	Programming for Everyone I Using Python*
DA105	Foundations of Data Analytics I Using Python*
HI430	Healthcare Compliance
MA130	Pre Calculus
MA270/290	Elementary Statistics/ Healthcare Statistics

YEAR 3 SEMESTER 6

CT118	Programming for Everyone II*
CT275	Agile Project Management
DA110	Foundations of Data Analytics II*
HI320	Legal and Ethical Issues in Health IT
MA240	Calculus I

YEAR 4 SEMESTER 7

CT108	Internet History Technology and Security*
CT300	Data Structures*
DA301	Principles and Techniques of Data Analytics I*
HI300	Current Issues in Healthcare
HU/SS	Social Science Elective **300 Level or Higher*

YEAR 4 SEMESTER 8

DA305	Principles and Techniques of Data Analytics II*
EN320	Technical Communication
HI410	Health Information Systems Integration
HI445	Professional Experience (Internship)
HU/SS	Social Science Elective **300 Level or Higher*

*8 Courses from Online LCMC - Lower Cost Models Consortium

Public Health

The Public Health concentration integrates Health IT skills with those of public health, emphasizing the implementation, and maintenance of a computerized infrastructure that advances the electronic reporting, exchange, and use of health information to improve public health and prepare for future pandemics. There's high demand for public health professionals trained in Health Information Technology, as the US government increases its investment to build a computerized public health infrastructure to improve electronic health information exchange between healthcare organizations and public health, as well as its policies, practices, standards, and services.

Outcomes

Upon successful completion of the Bachelor of Science in Health IT - Public Health track, all graduates will be able to:

- Design and develop entry-level database application systems.
- Design and develop websites using contemporary web design software.
- Apply knowledge of healthcare concepts and terminology to the creation and maintenance of computerized information storage and retrieval systems.
- Apply Health IT communication standards, such as the HL7 messaging standard, to improve and maintain the interoperability of health information systems.
- Observe administrative, legal, and medical constraints and rules in the implementation and use of Health IT systems.
- Provide entry-level computer programming and scripting to maintain and improve Health IT systems.
- Recognize the need for and develop the ability to engage in lifelong learning.
- Evaluate different Public Health IT solutions, and as part of a capstone project, recommend the best one(s) that can effectively address identified problems facing the Public Health domain.
- Assess the historical context of public health policies and use historical data to inform their positions.
- Source, analyze and explain epidemiological data to inform policy design.
- Assess the strengths and weaknesses of any given healthcare system.
- Evaluate the failures and successes of modern public health policies in the context of health trends, including epidemics and the COVID-19 pandemic, and their relevance for future policy decisions.
- Implement modern qualitative and quantitative research methods and evaluate the importance of those methods for a given problem.
- Understand the duties and responsibilities assigned to Health IT, Public Health, and Public Health IT or Informatics specialists in a real-world Public Health organization.

Typical Degree Requirements for the Public Health Track In the Bachelor of Science (BS) in Health Information Technology Program (125 CREDITS)

CORE TECHNICAL COURSES: 85 Credits

Course #	***Course***	***Credits***	***Lecture***	***Lab***
CT140	Google IT support Certificate Program	6	4	2
CT160	Networking	4	3	2
CT221	Enterprise Database Management	3	2	2
CT269	Cloud Computing and Virtualization Fundamentals	4	3	2
CT365	Network Security	4	3	2
DA105	Foundation of Data Analytics I Using Python	3	2	2
DA110	Foundation of Data Analytics II Using Python	3	2	2
HI110	US Healthcare Fundamentals	3	3	0
HI120	Medical Terminology	3	3	0
HI130	Introduction to Health Information Technology	4	3	2
HI210	Health IS Implementation and Workflow Analysis	4	3	2
HI300	Current Issues in Healthcare	3	3	0
HI310	Medical Coding, Classification and Communication	4	3	2
HI320	Legal and Ethical Issues in Health IT	3	3	0
HI330	Introduction to Healthcare Databases	4	3	2
HI410	Health Information Systems Integration	4	3	2
HI430	Healthcare Compliance	3	3	0
HI445	Professional Experience (Practicum)	4	3	2
HI490	Capstone Project	4	3	2
PS110	The History of Public Health	3	3	0
PS320	Epidemiology	3	3	0
PS401	Public Health Studies I	3	3	0
PS405	Public Health Studies II	3	3	0
PS410	Biostatistics Fundamentals with Python Programming	3	2	2

CORE GENERAL EDUCATION COURSES: 40 CREDITS

Required General Education Courses: 17 Credits

EN129/130	College Composition I	3	3	0
EN140	College Composition II	3	3	0
EN320	Technical Communication	3	3	0
MA270	Elementary Statistics	3	3	0
MA290	Topics in Healthcare Statistics	1	0	2
TS240	Human Anatomy and Physiology	4	3	2

MATH REQUIREMENT & ELECTIVE OPTIONS: 6 CREDITS

Course #	Course	Credits	Lecture	Lab
MA105	Technical Mathematics	3	3	0
MA120	College Algebra and Trigonometry	3	3	0
MA130	Pre-Calculus	3	3	0
MA240	Calculus I	4	4	0
MA250	Calculus II	4	4	0

GENERAL EDUCATION ELECTIVES: 8 CREDITS

MA130	Pre-Calculus	3	3	0
MA240	Calculus I	4	4	0
MA250	Calculus II	4	4	0
PH212	Physics I	4	2	3
PH213	Physics II	4	3	2
TS201	Environmental Science	3	3	0
TS242	Pathophysiology and Pharmacology	4	2	2

HU/SS SOCIAL SCIENCE ELECTIVES: 9 CREDITS

HU/SS	Social Science Elective 1	3	3	0
HU/SS	Social Science Elective 2	3	3	0
HU/SS	Social Science Elective 3*	3	3	0

* HU/SS Social Science Electives (9 Credits): 6 Credits Must Be 300 Levels or Higher

Typical Course Sequence for the Public Health Track in the Bachelor of Science (BS) Health Information Technology Program (125 Credits)

YEAR 1 SEMESTER 1

CT140 Google IT Support Certificate Program

EN 129/130 College Composition I

HI110 US Healthcare Fundamentals

MAE1 Math Elective

YEAR 1 SEMESTER 2

CT221 Enterprise Database Management

EN140 College Composition II

HI120 Medical Terminology

HI130 Intro to Health IT

MAE2 Math Elective

YEAR 2 SEMESTER 3

CT160 Networking

HI210 Health IS Implementation & Workflow Analysis

HI330 Healthcare Databases

HU/SS Social Science Elective

TS240 Human Anatomy & Physiology

YEAR 2 SEMESTER 4

CT269 Cloud Computing and Virtualization

CT365 Network Security

HI310 Medical Coding, Classification and Communication

HU/SS Social Science Elective

YEAR 3 SEMESTER 5

DA105 Foundations of Data Analytics I Using Python*

HI430 Healthcare Compliance

MA270/290 Elementary Statistics/ Healthcare Statistics

PS110 The History of Public Health *

GEE General Education Elective

YEAR 3 SEMESTER 6

DA110 Foundations of Data Analytics II*

HI320 Legal and Ethical Issues in Health IT

PS410 Biostatistics Fundamentals with Python Programming*

GEE General Education Elective

YEAR 4 SEMESTER 7

EN320 Technical Communication

HI300 Current Issues in Healthcare

HU/SS Social Science Elective **300 Level or above*

PS320 Epidemiology*

PS401 Public Health Studies I*

YEAR 4 SEMESTER 8

HI410 Health Information Systems Integration

HI445 Professional Experience or Internship

HI490 Capstone Project

PS405 Public Health Studies II*

*7 Courses from Online LCMC - Lower Cost Models Consortium

Heating, Ventilation, Air Conditioning, and Refrigeration (Certificate)

Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC&R) is rated by the U.S. Department of Labor as one of the fastest growing job areas in the country.

There are excellent employment opportunities available, both locally and nationally, for graduates of certificate programs.

This nine-month, 800-hour, full-time day or evening certificate program is designed to provide students with the knowledge and hands-on skills to become successful HVAC&R technicians. HVAC&R technicians work for heating and cooling contractors, refrigeration and air conditioning service and repair shops, schools, hospitals, office buildings, a variety of food industries, and local, state or federal government facilities.

Upon successful completion of the program, students are credited with 2000 hours towards the requirement to sit for the Massachusetts Refrigeration Technician License exam. Under the supervision of an instructor, the students will the learn installation, maintenance, diagnosis and repair of heating, cooling, and refrigeration equipment. The

HVAC&R program also provides preparation and proctored testing for the EPA 608 Universal Technician certification. In addition, we also offer an R-410A high-pressure refrigerant certification, OSHA 10-hour Safety certificate, NORA bronze oil certification, 609 MVAC (motor vehicle air conditioning) certification, and the Preventative Maintenance Technician Certification.

This program offers 150 hours of electrical code training and a minimum of 150 hours of refrigeration theory needed for Massachusetts state licensure and follows all federal regulations regarding gainful employment.

Curriculum

The course curriculum is structured to provide a basic knowledge of the refrigeration, air conditioning, and heating fields with no prior experience needed. Core courses in the first semester cover topics such as: refrigeration and heating principles, basic electricity and controls for HVAC&R, safety in the HVAC&R field, and use of HVAC&R tools and equipment. An EPA course covering the recovery, reclamation and recycling of refrigerant completes the first semester. In the second semester of the program, students concentrate on commercial refrigeration, air conditioning, psychometrics, and heat pumps. This semester also covers the electrical and mechanical components of heating systems including oil and gas-fired units, forced hot air, and hydronic boiler systems in a lab environment. Credits from this certificate program may be applied as technical electives for students who wish to pursue an associate degree in the Technology Business and Management program at Franklin Cummings Tech.

Facilities

Benjamin Franklin Cummings Institute of Technology maintains a HVAC&R laboratory with a wide variety of tools and equipment used in the heating, air conditioning, refrigeration, and ventilation industry. The HVAC&R Lab contains 20 refrigeration trainers, multiple high efficiency furnaces, air conditioners, ductless systems, and gas and oil fired boilers. HVAC&R Lab equipment gives students the real-world hands-on training needed to be successful in the HVAC&R field.

Outcomes

Upon successful completion of the HVAC&R Certificate, the graduate will be able to:

- Demonstrate the principles of refrigeration and air conditioning.
- Identify principles of different refrigerants and their temperature pressure relationships.
- Demonstrate a knowledge of refrigeration and air conditioning components, including compressors, evaporators, metering devices and condensers.
- Implement proper charging of refrigeration and air conditioning systems and proper leak detection methods.
- Solder, braze and ZoomlockTM pipes and fittings.
- Pressurize and detect leaks in a refrigeration system.
- Recover refrigerant from systems in accordance with EPA and Mass. Dept. of Public Safety guidelines.
- Flare and swage tubing.
- Troubleshoot electrical and mechanical malfunctions of commercial and domestic units.
- Use HVAC&R tools and measuring devices effectively.
- Proper installation maintenance procedures of heating, refrigeration, air conditioning and ventilation equipment.

The HVAC&R program is also offered during the evening for students who are unable to study during the day. Students in the HVAC&R evening program study Monday through Thursday. The program normally begins in January and concludes the following August. Information about the course schedule for the HVAC&R evening program is available through the Franklin Cummings Tech Admissions Office.

Faculty

John Terasconi, Program Chair

Instructor Staff: Thomas Pagliarulo, Mark MacCormack, Anthony Silva, Kevin Burns, Charles Randall, Laura Venterosa

Certificate Requirements for HVAC&R Technology 28 Credits

TECHNOLOGY COURSES: 28 CREDITS

Course #	Course	Credits
HV100	HVAC&R 1st Semester Fundamentals of Electricity as applied to HVAC-R Refrigeration Fundamentals Electrical and Mechanical for Refrigeration	13
HV150	HVAC&R Intersession EPA—Refrigerant Recovery, Recycle, and Reclaim	2
HV200	HVAC&R 2nd Semester Commercial Refrigeration and Ice Machines Commercial Air Conditioning and Heat Pumps Gas Heating and Residential Air Conditioning Oil Furnaces and Hydronic Heating	13

Opticianry (AS)

Opticianry is the branch of the eye health profession which specializes in the design, fitting, manufacturing, verification, and dispensing of ophthalmic prescription spectacles and contact lenses.

Since opticianry related services are offered by so many business venues such as optical chains, department stores, high fashion boutiques, health maintenance organizations and hospitals, medical offices of ophthalmology and optometry, and independent ownership, there is a great demand for qualified, well educated, and technically skilled opticians, especially in a licensed state such as Massachusetts.

Graduates of the two year opticianry program earn an associate degree in science in the field of opticianry (A.S. Opticianry.

In addition to the associate degree, the curriculum prepares students for each of the three national certification exams that are required by the Commonwealth of Massachusetts to apply and become a licensed optician, National Opticians Competency Exam (ABO), National Contact Lens Exam (NCLE), and the ABO Practical Exam (ABO P).

The opticianry curriculum is progressively structured so that students are academically and technically prepared to take the certification exams periodically while completing the two-year degree program. Most students complete all licensing requirements shortly (six months or less) after graduation.

As a licensed optician, many Franklin Cummings Tech graduates choose to pursue a career in specialized opticianry suchas optical management, contact lens fitting, pediatric opticianry, low vision care, optical training specialist, optical lab manufacturing, and entrepreneurship.

The Franklin Cummings Tech opticianry program is the only formal education program in Massachusetts, and one of only a few in New England. Since its inception in 2006, the Franklin Cummings Tech Opticianry program is the only program in the US that is directly supported and partnered with its state association, the Opticians Association of Massachusetts (OAM). The Franklin Cummings Tech Opticianry program is professionally accredited by the Commission on Opticianry Accreditation (COA) and is a member of the National Federation of Opticianry Schools (NFOS).

Facilities

The opticianry program features three dedicated learning spaces.

OPTICAL SHOP

Through the unscripted experiences of the Franklin Cummings Tech Optical Shop, students learn the delivery of customer and patient services, the art of designing, fitting, and dispensing prescription glasses, and the implementation of business systems and operational procedures, all while serving the vision needs of the Franklin Cummings Tech college community and neighborhood.

MANUFACTURING LAB

In the optical manufacturing lab students will learn the operation of instruments and machinery, and develop the technical skills, involving the manufacturing and verification of precision ophthalmic prescription glasses.

CONTACT LENS LAB

In the contact lens lab, students will learn the operation of instrumentation , and the clinical knowledge and technical skills involved in the design and fitting, and dispensing of prescription contact lenses.

Program Goals

The associate degree program in Opticianry will:

- Prepare students to complete successfully the American Board of Opticianry Examination, the National Contact Lens Examination, and the requirements for licensing in any state.
- Promote the highest technical and ethical standards in the practice and delivery of professional patient care.
- Provide students the opportunity to excel in all aspects of opticianry related to academic and practical knowledge,

technical skill and professional level competence.

- Promote inter-disciplinary and cooperative patient care concepts in order to take advantage of the strengths of optometry and opticianry in solving patients' vision care concerns and issues.
- Practice global awareness and ethical responsibility, fostering in students a commitment to civic engagement and volunteerism, leadership, and life-long learning through community-based learning projects and involvement with professional organizations, events and associations.
- Seek to eliminate hazardous waste and to reduce non-hazardous waste to the minimum levels economically and technically practical, and to be in full-compliance with all federal and state environmental regulations.

Outcomes

Upon successful completion of the degree, students will be able to perform the following professional responsibilities:

- Based upon a patient's prescription, vision needs and lifestyle and desires, visualize and design appropriate solutions pertaining to prescription glasses and/ or contact lenses.
- Design, fit and dispense prescription glasses and contact lenses
- Utilize and operate all forms of ophthalmic devices and instrumentation including keratometers, lenmeters, biomicroscopes, corneal topographers, pupilometers and digital image measuring devices.
- Utilize and operate all finishing lab equipment including edgers, heat treating units, safety beveling units, drop ball testing, chemical treating units, blocking and layout devices and rimless edging devices.
- Inspect and verify spectacle and contact lenses for optical precision, proper and comfortable fit, and proper aesthetics.
- Evaluate and troubleshoot patient's concerns and symptoms as they are related to the eyeglasses and contact lenses.
- Professionally and academically express optical technical skills and knowledge, both in an exam scenario, as well as in a clinical environment.

Faculty

Blair Wong M. Ed., LDO, ABOM, NCLC, CRO Director of Opticianry

Adjunct Faculty: George Bourque, Jr., LDO, ABO AC, NCLC ,Robert Goldman, BS, LDO, ABOC,Joanne Le, OD, BS ,Kevin Silva, BS, LDO, ABOC, NCLC,Da Ni Yan, BS, LDO, ABOC, NCLC

Degree Requirements: Opticianry (AS) 70 Credits

TECHNICAL COURSES: 46 CREDITS

Course #	Course	Credits	Lecture	Lab
OP105	Anatomy and Physiology of the Eye	3	3	0
OP110	Ophthalmic Optics I	3	3	0
OP115	Principles and Practices in Opticianry I	3	3	0
OP120	Ophthalmic Optics II	3	3	0
OP122/123	Ophthalmic Design & Dispensing I / Lab	4	3	1
OP125	Principles and Practices in Opticianry II	3	3	0
OP128	Optical Business & Clinical Care Management	2	2	0
OP 230/231	Contact Lens Theory I /Lab	5	3	4
OP232/233	Ophthalmic Design & Dispensing II / Lab	4	3	1
OP235	Principles and Practices in Opticianry III	3	0	3
OP 240/241	Contact Lens Theory II /Lab	5	3	4
OP243	Principles and Practices in Opticianry IV	3	3	0
OP245	Vision Assessment	3	0	3
OP281	Opticianry Technical Skills & Service Lab I	1	0	2
OP282	Opticianry Technical Skills & Service Lab II	1	0	2

GENERAL EDUCATION: 24 CREDITS

Course #	Course	Credits	Lecture	Lab
BS201	Small Business Management	3	3	0
EN129/130	College Composition I	3	3	0
EN140	College Composition II	3	3	0
HU/SS	Social Science Elective	3	3	0
HU/SS	Social Science Elective	3	3	0
HU/SS	Social Science Elective	3	3	0
MA105	Technical Math	3	3	0
MA107	Optical Math	3	3	0

Typical Course Sequence for Opticianry

SEMESTER 1

EN129/130 College Composition I

MA105 Technical Math

OP105 Anatomy and Physiology of the Eye

OP110 Ophthalmic Optics I

OP115 Principles and Practices in Opticianry I

OP122/123 Ophthalmic Design & Dispensing I/Lab

SEMESTER 2

EN140 College Composition II

HU/SS Social Science Elective

MA107 Optical Math

OP120 Ophthalmic Optics II

OP125 Principles and Practices in Opticianry II

OP232/233 Ophthalmic Design & Dispensing II/Lab

SEMESTER 3

BS201 Small Business Management

HU/SS Social Science Elective

OP230/231 Contact Lens Theory I/Lab

OP235 Principles and Practices in Opticianry III

OP281 Opticianry Technical Skills & Service Lab I

SEMESTER 4

HU/SS Social Science Elective

OP128 Optical Business and Clinical Care

OP240/241 Contact Lens Theory II/Lab

OP243 Principles and Practices in Opticianry IV

OP245 Vision Assessment

OP282 Opticianry Technical Skills & Service Lab II

Practical Electricity (Certificate)

According to the U.S. Department of Labor, electrician job growth will be higher than average, growing at a rate of 23% over the next decade (Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2012-13 Edition). Here in the state of Massachusetts, that growth rate is estimated to be even higher as many in the current workforce will be retiring in the next few years.

The Electrical Technology Department offers a twelve-month Certificate of Proficiency in Practical Electricity. This program fulfills the Massachusetts Board of State Examiners of Electrician's academic requirements for Journeyman Electrician licensure by providing 600 hours of classroom instruction in accordance with 237 CMR 13 and 22.

The course of study includes the theoretical application of electricity as applied to the electrical construction industry and relevant Electrical Code requirements necessary to design and install a compliant installation.

A laboratory component accompanies every course and provides practical, hands-on skills that are desired of apprentice electricians seeking employment. Through a blend of lecture and laboratory classes, the certificate program provides a deep introductory knowledge of the electrical field. Upon successful completion, graduates are well positioned to start learning on-the-job while having foundational understanding of electrical principles.

Curriculum

The curriculum is aligned with the learning objectives outlined in 237 CMR 22.01, as mandated by the Massachusetts State Board of Examiners of Electricians. Courses include topics such as DC and AC circuit theory, electrical code and wiring lab, electrical machines, and low voltage systems. Laboratory projects accompany all classes. Credits from this certificate program may be applied as technical electives for students who wish to pursue an associate degree in the Technology Business and Management program at Franklin Cummings Tech.

Facilities

The Practical Electricity program utilizes two laboratories, which are equipped to provide students ample and meaningful hands-on experience in the electrical field. The two labs provide students with the opportunity to learn the basics of wiring, as well as the proper methods of application to the many theoretical principles of motors, transformers, and low voltage systems. The two labs are the Wiring Method lab and the Electro-Mechanical lab.

Outcomes

Upon successful completion of the Practical Electricity Certificate program, the graduate will be able to:

- Comprehend and utilize current Electrical Industry Standards, including the National Electrical Code (NFPA 70), Massachusetts Electrical Code (527 CMR 12.00), and Standards for Electrical Safety in the Workplace (NFPA 70E).
- Identify and install electrical devices and equipment, utilizing a variety of wiring methods and practicing safe work habits.
- Design, analyze and install various electrical circuits and diagrams related to residential, commercial, and industrial applications.
- Perform electrical calculations, including Ohm's law, wire sizing, branch-circuit overcurrent protection sizing, voltage drop, and residential service entrance.
- Design, analyze, and troubleshoot motor circuits and motor controls.

Faculty

Instructor Staff: Rui Gomes, Anthony DeGuglielmo, Steven Porter, and Scott Hayes

Certificate Requirements: Practical Electricity 28 Credits

TECHNOLOGY COURSES: 28 CREDITS

Course #	***Course***	***Credits***	***Lecture***	***Lab***
PE101*	Electrical Code I	5	8	2
PE103*	Electrical Circuit Theory	5	6	4
PE201*	Electrical Code II	5	8	2
PE203*	Electrical Machines	5	6	4
PE211*	Electrical Code III	5	8	2
PE213*	Electrical Systems & Regulations	3	5	2

* These courses count towards the 600 clock hours of classroom instruction required by the Massachusetts State Board of Electrical Examiners for partial fulfillment of the requirements for Journeyman Electrician licensure.

Typical Course Sequence

SEMESTER 1		SEMESTER 2		SEMESTER 3	
PE101	Electrical Code I	PE201	Electrical Code II	PE211	Electrical Code III
PE103	Electrical Circuit Theory	PE203	Electrical Machines	PE213	Electrical Systems & Regulations

Division of Professional and Continuing Studies (DPCS)

The Division of Professional and Continuing Studies (DPCS) serves working adults who want to advance their careers through education. We offer the following types of programs:

Certificates which are stackable to degrees

Single courses (credit and non-credit), including CEUs

Degree pathways that enable working adults to complete an undergraduate degree

Credit Courses/Certificates

CONSTRUCTION MANAGEMENT CERTIFICATE

Fast-paced, seven-week courses focus on estimating, scheduling, sustainable building technologies, and other key skill areas. Through this Certificate program, you will earn 19 credits, in which can be transferred into the Associate of Science in Construction Management.

Course #	*Course*	*Credits*	*Lecture*	*Lab*
CM100	Construction Graphics & Documents	3	3	0
CM110	Construction Management	3	3	0
CM130	Construction Estimating	3	3	0
CM160	Building Materials and Applications Methods	4	3	2
CM220	Sustainable Building Technologies	3	3	0
CM260	Project Scheduling	3	3	0

PROJECT MANAGEMENT CERTIFICATE

Accelerated, seven-week courses focus on scoping projects effectively, improving time budgeting and resource allocation, and preparing you for project management roles in any sector.

BS101	Principles of Accounting	3	3	0
BS130	Introduction to Project Management	3	3	0
BS260	Project Planning	3	3	0
BS324	Managing Organizations	3	3	0
BS330	Project Execution, Monitoring & Control, Implementation & Closure	3	3	0
BS460	Advanced Project Management - Practicum	3	3	0

PROFESSIONAL LAND SURVEYING COURSES - CREDIT

Designed for those currently working in the land surveying field, these 3-credit, specialized courses teach aspects of real estate law, surveying, and boundary topics needed to become a registered Professional Land Surveyor in Massachusetts:

CM270: Principles of Boundary Law 1 (3 credits)

CM275: Principles of Boundary Law 2 (3 credits)

CM230: Massachusetts Statutes and Regulations (3 credits)

Non-credit Courses/Certificates – Continuing Education Units (CEU's)

CONSTRUCTION SUPERVISOR LICENSE PREPARATION COURSES (2.1 CEU'S)

Become a licensed Construction Supervisor in the Commonwealth of Massachusetts. Wentworth's Construction Supervisor's License (CSL) Preparation will prepare you to take the state licensure exam for commercial and residential buildings. This license allows you to supervise construction for any single- or two-family dwelling or appurtenant structure, regardless of size, as well as any other building type up to 35,000 cubic feet of enclosed space. Course reference materials: MA Code Books; ICC Code Books; OSHA Book.

BUILDING INFORMATION MODELING (BIM) (6.3 CEU'S)

Our hands-on learning will give you the skills you need to collaborate on the planning, design and construction of a building using 3D modeling. Master the principles of parametric modeling, flexing parameters, design visualization and other topics. And build competencies in Revit Architecture, the premier software application for building information modeling. Choose Revit MEP, for mechanical, electrical and plumbing modeling, or Revit Structure with an emphasis on structural design and analysis.

PLAN READING - LEVEL 1 (2.1 CEU'S)

This introductory course provides a basic level of knowledge required for the reading and understanding of architectural and construction plans. This course is intended for people interested in expanding their career in the construction field. Concepts and theories covered by this course will include; orthographic projection; plans, elevations, sections, details, symbols, line types, dimensioning, architectural and engineering scales associated with architectural, construction, and engineering drawings.

PLAN READING - LEVEL 2 (2.1 CEU'S)

This course is designed for individuals who have completed the Plan Reading – level 1 or work experience. This 7-week course will review in detail; site plans, foundation plans, framing and structural plans, and MEP system plans. Drawings reviewed range in complexity from basic to advanced construction drawings. Students will learn about various building construction types as well as learn to read, understand and interpret construction drawings.

PRACTICAL PROJECT MANAGEMENT (3.0 CEU'S)

The course is designed for working professionals from any field, who wants to learn basic skills in project management. The program is 15-Week long, upon successful completion of the program, students earn 4.5 CEU's.

Academic Course Descriptions

AT134 AUTOMOTIVE BRAKES SYSTEMS 4 CREDITS

This course teaches students braking system theory, operation and repair. The students will study all brake hydraulics, such as proportioning valves, master cylinders and bleeding procedures. The students will also study power assist units, antilock brakes, disc and drum brakes, brake by wire, and Hybrid Electric Vehicle regenerative braking systems. Students will learn how to diagnose and properly repair all of these systems.

AT150 AUTOMOTIVE ENGINES 4 CREDITS

Lecture and laboratory covering designs, nomenclature, and operational theory of internal combustion engines. Includes valves and operating mechanism, piston and connecting rod assembly, crankshaft and bearings, lubrication system, crankcase ventilation, lubricants, and complete engine overhaul procedure. Laboratory practice and instruction in servicing engines. (Offered in the fall and spring)

AT170 ELECTRICITY AND ELECTRONICS 4 CREDITS

Fundamentals of electricity and magnetism. Topics include current, voltage and resistance; Ohm's Law; series and parallel circuits; electric power; electromagnetic circuits; electrical measurement; electronic devices and circuits. (Offered in the fall and spring)

AT173 AUTOMOTIVE ELECTRICAL SYSTEMS 4 CREDITS

Operation, construction, and servicing of automotive electrical equipment including lighting circuits, ignition systems, cranking motors and controls, and alternator-regulator circuits. Prerequisite: AT170 (Offered in the spring and summer)

AT234 AUTOMOTIVE CHASSIS AND SUSPENSION SYSTEMS 3 CREDITS

This course is designed to teach students various automotive chassis and steering systems operation and repair. Students will learn chassis designs, alignment angles, including front and rear suspension systems. They will also be taught steering gears, steering linkage and advanced level systems such as; Active Aerodynamics, HEV and Autonomous Vehicle chassis and suspensions and electronic steering. Students will examine electronic suspension control systems, stability control systems and the proper diagnosis and repair of these systems.

AT241 MANUAL TRANSMISSIONS 2 CREDITS

The theory, operation and service of manual transmissions and transaxles, including domestic and imported units. Emphasis is on the diagnosis, repair, and servicing of component parts. (Offered in the fall)

AT244 AUTOMATIC TRANSMISSIONS 2 CREDITS

Continuation of AT241. Study of principles of operation, maintenance, and diagnosis of automatic transmissions. Prerequisite: AT241 and AT173 (Offered in the spring)

AT252 AIR CONDITIONING 3 CREDITS

This course is a comprehensive study of automotive cooling, heating, ventilation and air conditioning systems. Studies include topics on bodily comfort, heat and pressure, and temperature relationships. The course culminates with a study of computer controlled, dual-zone climate control systems. Prerequisite: AT170 (Offered in the spring and summer)

AT253 AUTOMOTIVE LABORATORY I 4 CREDITS

Practical, hands-on garage experience is acquired in the automotive laboratories, including major service work on live vehicles and the operation of test instruments and other specialty diagnostic equipment. Students will apply the theory learned in the first-year automotive classes to become more proficient in the diagnosis of engines, electrical, suspension, steering, and brake systems. This practical experience incorporates strategy-based engine performance, emission failure diagnosis, and engine rebuilding and machining. Prerequisites: A valid driver's license, AT134, AT150, and AT173 (Offered in the fall)

AT254 AUTOMOTIVE LABORATORY II 4 CREDITS

Practical, hands-on garage experience is acquired in the automotive laboratories, including major service work on live vehicles and the operation of test instruments and other specialty diagnostic equipment. Prerequisite: A valid driver's license, AT253, AT234 and AT271 (Offered in the spring)

AT255 ALTERNATIVE FUELS 3 CREDITS

This course will concentrate on the theory, operation, and service of all alternative fuels and electric vehicles. The topics of study will be hybrid battery service, electric motors, generators, regenerative braking Systems, hybrid transmissions and hybrid heating and air conditioning. The lab component will secure all the theory taught in lecture. Prerequisite AT173 and AT134. (Offered in the fall)

AT256 AUTOMOTIVE LAB-CERTIFICATE 3 CREDITS

Practical, hands-on garage experience is acquired in the automotive laboratories, including major service work on live vehicles and the operation of test instruments and other specialty diagnostic equipment. Students will apply the theory learned in the first-year automotive classes to become more proficient in the diagnosis of engines, electrical, suspension, steering, and brake systems. This practical experience incorporates strategy-based engine performance, emission failure diagnosis, and engine rebuilding and machining. Prerequisites: A valid driver's license, AT134, AT150, and AT173. (Offered in the fall and summer)

AT259 INTRODUCTION TO AUTOMOTIVE SAFETY AND TECHNOLOGY 3 CREDITS

This course looks at the present use of automotive safety in the automotive industry, along with future technology. Topics covered are SP2 training, equipment and tool identification, safety procedures and precautions that are required when repairing vehicles, batteries, high voltage batteries, hybrid vehicles and fuel cells. The lab portion focuses on safety, service, and maintenance of vehicles, electric vehicles and bio fuels vehicles.
(Offered in the fall and spring)

AT271 ENGINE PERFORMANCE AND DIAGNOSIS I 4 CREDITS

This course applies the theory learned in AT150 Engines and AT170 Electricity to properly diagnose mechanical and electrical problems that affect drivability and emissions. Material includes current tune-up and maintenance procedures, the development of diagnostic routines, basic ignition diagnosis, on-vehicle electrical testing, volumetric efficiency theory and testing, turbocharger/supercharger theory and diagnosis, and On-Board Computer Diagnosis. Prerequisites: AT150 and AT170 (Offered in the fall, spring and summer)

AT274 ENGINE PERFORMANCE AND DIAGNOSIS II 4 CREDITS

This course builds on AT271, enabling students to understand the complexities of electronic engine management systems and how they affect drivability and emissions. Diagnosis topics include fuel systems theory, fuel injection systems, microprocessor theory and operation, Electronic Ignition Systems (E.I.S.), four- and five-gas analysis, emission failure, and On-Board Computer Diagnosis. Prerequisite: AT271, AT150 and AT173 (Offered in the spring)

AT282 AUTOMOTIVE SERVICE ADVISING AND CUSTOMER RELATIONS 3 CREDITS

This course enables the students to understand the complexities of automotive customer service. Topics of study include the different types of automotive facilities, customer relations, and internal service facility operations. Through lectures and class discussion, the student should be aware of the different types of automotive repair facilities ownerships, the chains of command, and roles and requirements for each of the different employees. The student will be able to identify the major financial measurements that have an effect on the business's profit or loss. The student will also be exposed to the start-up cost and procedures involved in the development of a new automotive repair business. Topics of study include customer interviewing and complaint assessment, flat rate and hourly methods of payment and benefit packages. Case studies are presented and guest lecturers from industry are utilized to reinforce service-advising principles. (Offered in the spring)

AT373 ADVANCED ENGINE PERFORMANCE 3 CREDITS

An advanced level course which builds upon the basic computerized engine control diagnostic skills acquired in AT271, AT274, and the drivability clinic. Special emphasis is placed on oscilloscope pattern interpretation, serial data communications, database configurations and functional testing of major computerized engine control systems and subsystems. Prerequisite: AT274 (Offered in the fall)

AT474 ENHANCED EMISSIONS AND DRIVABILITY 3 CREDITS

An advanced level of enhanced emissions and drivability diagnostics using dynamometer-based transient testing covering ASM 50/15, ASM 25/25 and RG-240 drive traces. This course also includes advanced On Board Diagnostics-Generation II (OBD II) and Controller Area Network (CAN) diagnostics. Students will become proficient in 5-gas exhaust analysis and scan tool data stream information and applications. (Offered in the spring)

AT481 AUTOMOTIVE MARKETING 3 CREDITS

This course exposes the student to today's marketing principles as they relate to the automotive field. Through lectures, practical exercises, and class discussion, the student will be made aware of the marketing process, understanding the marketplace and consumers. The student will also be able to design a customer-driven marketing strategy based on automotive customers needs. Distribution and sale of automotive vehicles and related parts and accessories are topics that are also covered. The student will learn policies pertaining to wholesale and retail transactions, parts inventory and turnover, service sales, dealership personnel, and warranty. (Offered in the spring)

AT482 VEHICLE APPRAISAL 3 CREDITS

Instruction and practical application in the use of estimating manuals to produce reports for buying, selling and trading of vehicles, including damage appraisal. (Offered in the spring)

AT483 COMPUTERS IN THE AUTOMOTIVE INDUSTRY 3 CREDITS

Microcomputer applications of database, spreadsheet, and office management in the automotive industry. Specific automotive management packages that service an entire automotive enterprise including sales, parts and inventory, and service will be covered. (Offered in the fall)

AT485 SENIOR SEMINAR I 1 CREDIT

The preliminary section of a two-part course of study that will explore research tools and methods utilizing virtual and physical library resources as well as Internet Meta-search tools. Skills acquired will allow students to develop individual research topics and hypothesis statements that will lead to the formal presentation of a Senior Research Project in AT495. Prerequisites:,EN320 (Offered in the fall)

AT494 SERVICE MANAGEMENT 3 CREDITS

This course enables the students to understand the complexities of automotive service management. Through lectures, practical exercises, and class discussion, the student will be made aware of the different types of automotive repair facilities, ownerships, the chains of command, roles and requirements for the service manager in each of the different facilities. The student will also be exposed to the recruitment, selection, induction, development, and evaluation of employees. Also the student should be able to identify and use financial reports to be able to analyze financial data that has an effect on the business's profit or loss. Upon successful course completion, the students will have the tools needed to be able to maintain and also increase the profitability of a modern day automotive repair facility. Theory and practice of service management are explored, including OSHA laws, record keeping, productivity, efficiency, and profitability. (Offered in the fall)

AT495 SENIOR SEMINAR II 3 CREDITS

This concluding course expands on the topics previously developed and approved in AT485. Students will have the opportunity to discuss, organize and refine their chosen projects. The culmination of this course will be the presentation of a formal written Senior Research Project. Prerequisite: AT485 (Offered in the spring)

BE202 BUILDING AUTOMATION SYSTEMS AND CONTROLS (4 CREDITS)

This course teaches students a broad understanding of direct digital control systems and building automation systems. Students will learn about basic electrical control systems, electronics, and an overview of the various approaches to system architecture, hardware, interfaces, software, and system components. in Heating, Ventilation, Air Conditioning and Refrigeration (HVAC-R) control systems.

BE210 HVAC-R BAS LAB (2 CREDITS)

The Heating, Ventilation, Air Conditioning and Refrigeration (HVAC-R) lab gives students hands-on experience working with a variety of commercial and residential units to reflect the most current technologies in the field. The lab allows the students to connect actual systems that can exhibit a multitude of scenarios relevant to contemporary HVAC-R systems.

BE212 HVAC-R INSTALLATION AND MAINTENANCE (4 CREDITS)

This course is designed to introduce wiring installations of hardware, network software, and web-based controls of building automation control systems and equipment. Students will gain the knowledge to retrofit existing building systems as well as testing and commissioning new equipment. It also covers the methods and tools used in the troubleshooting and repairing HVAC-R control systems. including electrical circuits, mechanical and pneumatic devices, inputs and outputs, controller configurations, network setup, VAVs, air handlers, chillers, and boiler control systems.

BS201 SMALL BUSINESS MANAGEMENT 3 CREDITS

This course introduces students to the fundamental practices of small business management. Topics will include basic business planning principles, inventory management, sources of funding for small businesses and marketing strategies. Content will focus on the risks and opportunities in the Opticianry Field. (Offered in the fall)

BS285 TECHNOLOGY BUSINESS CAPSTONE 1 CREDIT

Working in teams, students will develop a technological idea into a business plan and then pitch that plan to a panel of representatives from potential funding sources. Students will consult with each other and with technology majors to build the knowledge-base of the plan. (Offered in the spring)

BS311 MICROECONOMICS 3 CREDITS

A broad introductory survey in which special attention is given to the role of economic principles in analyzing and understanding current economic problems. Emphasis is placed on the functioning of markets and on examining the behavior of individual economic units such as the business firm and the consumer. (Offered in the fall)

BS312 ADVANCED CONCEPTS IN INFORMATION LITERACY 3 CREDITS

This project-based course covers the process of information literacy; from determining information needs through evaluating, managing and disseminating information; by integrating academic research strategies with advanced applications of desktop software. Best practices for effective communication of information in multiple formats will be examined with emphasis on integrating software programs through merging, transferring and linking files. (Offered in the fall)

BS324 MANAGING ORGANIZATIONS 3 CREDITS

Examines theory, research, and practice in the management of organizations. Students learn to make use of analytical tools for recognizing, diagnosing, and acting on managerial problems related to organizations, to the objectives, and to the development of human resources. The course emphasizes topics at the macro level, such as organizational analysis and design, and at the micro level, such as managerial behavior, motivation, and interpersonal relations. (Offered in the spring)

BS325 PROJECT MANAGEMENT 3 CREDITS

This course provides an introduction to project management. It takes a holistic, integrated approach to managing projects, exploring both technical and managerial challenges multiple industries experience in several areas of project management such as scheduling, financing, marketing, distribution, and organizational structures. (Offered in the spring)

BS332 FINANCIAL ACCOUNTING 3 CREDITS

Presents the theory and techniques of financial accounting. The course encompasses the basic functions of collecting, processing, and reporting accounting information for interested third parties (e.g., owners, investors, and government) and enables students to analyze, interpret, and use accounting information. (Offered in the spring)

BS334 BUSINESS LAW AND LEGISLATION 3 CREDITS

This course reviews the American legal system, organizational structures, and the regulatory environment pertinent to business. Critical examination is conducted regarding: business ethics; contracts; business associations (agency, partnerships, corporations); and other legal entities. (Offered in the spring)

BS431 MANAGEMENT ACCOUNTING 3 CREDITS

Presents the theory and technique of managerial accounting from the particular perspective of the manager. The course covers the identification and analysis of the behavior of costs within the organization, and illustrates how managers use such knowledge for planning and control. Major topics include responsibility accounting, comprehensive and cash budgeting, and standard job order and process cost systems. Prerequisite: BS332 (Offered in the fall and spring)

BS432 HUMAN RESOURCES MANAGEMENT 3 CREDITS

Examines the role of the human resources manager in the areas of selection and placement; training and development; performance appraisal; wage, salary, and benefit programs; and labor-management relations. (Offered in the fall)

CM100 BUILDING CONSTRUCTION GRAPHICS 3 CREDITS

Fundamental principles of Building Construction Graphics are presented in weekly lectures and are developed in the lab through a wide variety of assignments and a semester long project. Emphasis is placed on the core competencies of graphic communication for the built environment, how design professionals communicate ideas, from inception through construction. Students will learn foundation concepts including: measurement and scale and the reading of and interpretation of architectural drawings - plans, sections, elevations. Other topics include an explanation of graphic symbols and abbreviations, dimensioning, typical US sheet sizes, proper sheet (page) layout, sheet arrangement, sheet sequence (set), and drawing relationships on a sheet. Students will begin to understand and apply construction regulations, specifications and standards such as CSI Masterformat, Project delivery, ADA accessibility, building codes, zoning regulations, and LEED. (Offered in the fall and spring)

CM110 CONSTRUCTION MANAGEMENT I 3 CREDITS

This course offers a sampler of the entire CM program. It provides the first introduction to the principles of management, construction industry, roles and responsibilities, and an overview of common project management tools.

Upon successful course completion, students will be able to understand terminology common to the construction industry, general principles of management and the roles and responsibilities of parties. Students will be familiar with selected planning and control tools and common safety concerns and protocol. This course concludes with a final CM project. (Offered in the fall and spring)

CM120 INTRODUCTION TO CAD 3 CREDITS

Through lectures and hands-on laboratory sessions students will be introduced to the use of computers for the production of drawings. Students will learn to create architectural drawings similar to those produced in an architectural office, using industry standards such as AutoCAD and National CAD Standard v5. CAD skills will include basic drawing, modifying and editing commands, and proper techniques for final presentation drawings. Students will learn these skills through the development of a semester project from plans to a 3d modeling. At course end, students take a simulated AutoCAD assessment exam in order to demonstrate their proficiency in AutoCAD. (Offered in the spring and summer)

CM130 CONSTRUCTION ESTIMATING 3 CREDITS

This course introduces students to the skills and tools necessary to prepare cost estimates for construction projects. The course focuses on the blueprint reading and determination of quantities (materials takeoff). Classes will include lectures, problems, examples and a term project. This course aims to increase and improve the working knowledge of students in construction estimating and to train them as professional construction managers.

Upon successful course completion, students will be able to read blueprints, and perform quantity takeoff for various work items. Students will utilize computer software to prepare required deliverables. Perform quantity take offs and pricing for a small construction project. Emphasis shall be placed on the scope of work, coordination and quantity surveys for the building components for residential and commercial projects. (Offered in the spring and summer)

CM145 HEAVY CONSTRUCTION 3 CREDITS

This course introduces students to horizontal construction including equipment and selected construction methods. This includes economy, selection, and productivity of common construction equipment and construction procedures for industrial and heavy civil construction.

Upon successful course completion, students will be able to understand terminology and units of measurements related to equipment usage in industrial and heavy civil projects. Understand standard designations, sizes, and graduations of equipment and perform comparative cost analysis for owning and operating heavy equipment. Perform the proper selection, applications, utilization and productivity of heavy equipment and understand general processes/methods for constructing industrial and heavy civil projects. Show awareness of construction Safety (OSHA regulations for excavation, inspection and protection). (Offered in the spring and summer)

CM160 BUILDING MATERIALS AND APPLICATIONS 4 CREDITS

Building Materials and Applications is a comprehensive study of building construction technology, which includes various building systems, the construction process and the materials used in those systems and processes. The study of the methods and techniques of material extraction, manufacturing assembly and installation are covered in depth. Students will learn about specific material's properties, characteristics, and their combinations to form composite elements. Construction regulations and standards including building codes, zoning regulations, and ADA accessibility are studied.

The construction process is examined, including the roles of professionals such as regulatory agencies, the design team, the construction team, financing agencies, the owner, and the user. Professional industry entities dealing with building specifications such as the CSI (construction specifications institute), their composition and organizational components such as Masterformat and Project Delivery are covered as well as green rating systems such as LEED (leadership in energy and environmental design) for new construction. The course also provides an overview of building structural design.

Students will develop several semester projects that tie directly to lectures and offer practical application of textbook material. Each project will focus on basic building materials such as wood, concrete, masonry, and steel construction. Students will design and draft simple construction documents with attention on construction details for different assemblies. (Offered in the fall and spring)

CM210 CONSTRUCTION MANAGEMENT II 3 CREDITS

A management course in contract documents, safety, planning, scheduling, production control, and law and labor. Topics include contracts, planning, cost, production, peripheral documents, and cost and work analysis. Students implement CM practices in their final project and project presentation.

Upon successful course completion, students will be able to explain construction contract documents, planning and scheduling, cost and production controls. Describe laws and labor issues related to construction projects. Demonstrate the ability to plan and schedule a construction project. Implement job site safety practices and procedures. Identify use of tools and equipment along with method of use in construction and perform common procedures at the job site. Describe and recognize requirements in construction documents. Describe terms and methods in techniques for planning, scheduling and supervision and identify laws and labor issues in construction. Demonstrate problem solving techniques and dexterity in planning and scheduling projects. This course concludes with a final Capstone project. (Offered in the spring)

CS215 DIGITAL FORENSICS 4 CREDITS

This course focuses on the use of the most popular forensics tools and provides specific guidance on dealing with civil and criminal matters relating to the law and technology. Students will learn how to identify, collect and preserve digital evidence and will have discussions on how to manage a digital forensics operation in today's business environment. This course will provide theoretical as well as hands-on practical knowledge in order to perform digital investigations such as preservation, analysis and acquisition of digital information.

CM220 SUSTAINABLE BUILDINGS: DESIGN & CONSTRUCTION 3 CREDITS

Overview of the concept of sustainability (holistic living and building design that integrates solar concepts, energy efficiency, and material ecology) and its economic, political, and environmental consequences. Lecture and hands-on application focus on sustainable building practices, including design, specification, construction, lifecycle issues, LEED certification and other organizations. The historical basis for the ideology of sustainability, and its applications in today's society will be explored. (Offered in the fall)

CM230 MASSACHUSETTS STATUTES AND REGULATIONS 3 CREDITS

This course involves the study of those regulations directly affecting the practice of land surveying in the Commonwealth of Massachusetts such as the Registration Law (MGL Chap. 112, Secs. 81D-81T), the regulations of the Board of Registration of Professional Engineers and of Land Surveyors (250 CMR), the Subdivision Control Law (MGL Chap. 41), the Zoning Act (MGL Chap 40A) and the Massachusetts Land Court Manual of Instructions. Students will be introduced to other bodies of regulations often encountered in the practice of land surveying such as municipal subdivision regulations, the Wetlands Protection Act, and the Massachusetts Environmental Policy Act. Emphasis is on applying the various regulations in a professional practice.

CM240 ENVIRONMENTAL SYSTEMS 4 CREDITS

The study of heating, ventilation, air conditioning, plumbing and electrical systems for facilities both residential and commercial is taught. Students will learn to understand the basic design and construction terminologies used to be able to read and understand HVAC, plumbing and electrical construction documents. Also included is the presentation of the basic principles found in vertical circulation, security, fire protection, noise control and room acoustics, energy sources, and green building design considerations. Field trips to area construction and building sites augment class studies. (Offered in the spring)

CM250 CONSTRUCTION SURVEYING 4 CREDITS

The purpose of this course is to provide the student with the fundamental understanding of land surveying, including both the theory of surveying as well as the hands-on use of modern surveying instruments. Specifically, the theory portion of the course includes surveying computations of: grade, direction, traverse adjustment, area, volume, and horizontal & vertical curve geometry. The instrumentation portion of the course includes making field measurements of elevation, distance and angle using the appropriate land surveying equipment including: the tape, engineer's level, transit, theodolite, EDMI, and total station. An introduction to construction layout is also included.

Upon successful course completion, students will understand the use of measuring systems and the proper mathematical calculations to produce accurate and correct true distances and the use of a level and the mathematical calculations to determine elevation differences. Understand the use of a transit to determine vertical and horizontal angles to locate reference points as applied to construction staking and surveying. Students will have an improved understanding of the rule on Construction Surveying and layout in the operation of the construction industry. (Offered in the fall and spring)

CM260 PROJECT SCHEDULING 3 CREDITS

This course introduces students to the theory and application of the fundamentals of construction planning and scheduling to include creating, presenting, revising, and updating construction schedules. This course will help enhance students' ability to understand and apply management principles and practices including: process planning, directing, costing, resource allocation, and controlling all aspects of the construction operations and resources from pre-construction through project close out.

Upon successful course completion, students will be able to understand and apply network scheduling methods to construction projects and prepare WBS (work breakdown structures). Perform cost and budget analysis and calculate schedule and cost variance for projects. Use commercial scheduling software and perform resource allocation and leveling. Update schedules and monitor work progress using the schedule and other tools/programs in managing a construction project. (Offered in the fall)

CM270 PRINCIPLES OF BOUNDARY LAW 1 3 CREDITS

This course includes an introduction to the realm of real estate law that is essential to the practice of land surveying and the basics of land surveying research. Real estate law and conveyancing terminology, evidence gathering and research theory will be taught. Key principles of boundary law will be explored such as the relative weight of evidence, sequential and simultaneous conveyances, easements and rights of way, and the public land survey system.

CM275 PRINCIPLES OF BOUNDARY LAW 2 3 CREDITS

Building on the principles taught in Legal Aspects of Land Surveying I, special boundary topics such as water boundaries, unwritten transfers and writing legal descriptions will be covered, along with the roles of statute and case law in the boundary decision process. Students will complete a final project that will involve the application of legal principles to an actual surveying problem, requiring them to make boundary decisions involving conflicting evidence. Prerequisite: CM270.

CM280 STATICS AND STRENGTH OF MATERIALS 4 CREDITS

Introduction to the basic fundamentals of statics and strength of materials relating to structural components of a building or structure. The principles of static equilibrium and free-body diagrams are applied to basic building structural elements and simple structural systems commonly found in buildings. The principles of stress, strain, and material properties are studied as they relate to materials commonly used in the building industry. Bending, shear, and deflections and associated stresses are investigated and used as design requirements. Prerequisite: MA120 and PH212 (Offered in the fall and spring)

CS105 NETWORK COMMUNICATION AND SECURITY FUNDAMENTALS 4 CREDIT

This course covers technical and managerial aspects related to data communication, computer, and telecommunication networks. Additionally, the course aims to provide a solid understanding of data communications and networking principles including networking and telecommunications technologies, hardware, and software. The

course will also serve as an introduction to telecommunication network management, network security, cost-benefit analysis, and evaluation of connectivity options.

CS110 INTRODUCTION TO CYBERSECURITY AND RISK MANAGEMENT 4 CREDIT

This course examines detailed aspects of cybersecurity, incident response and contingency planning consisting of incident response planning, disaster recovery planning, and business continuity planning. Developing and executing plans to deal with incidents in the organization is a critical function in information security. This course focuses on the planning processes for all three areas of contingency planning, incident response, disaster recovery and business continuity, as well as the execution of responses to human and non-human incidents in compliance with these policies.

CS201 NETWORK DEFENDER 4 CREDITS

Students will become Network Administrators who are trained on protecting, detecting and responding to the threats on the network. Students will acquire the fundamental understanding of the true construct of data transfer, network technologies, software technologies so that they understand how networks operate.

CS202 ETHICAL HACKER 4 CREDITS

The Ethical Hacker course teaches students to systematically attempt to inspect network infrastructures (with the consent of its owner) to find security vulnerabilities which a malicious hacker could potentially exploit. This accredited course provides the advanced hacking tools and techniques used by hackers and information security professionals alike to break into an organization. As we put it, “To beat a hacker, you need to think like a hacker”.

CS205 INTRUSION DETECTION AND PREVENTION SYSTEMS 4 CREDITS

This course will deal with methods that ID systems use to detect attacks against Information Networks. These methods will include auditing systems, monitoring techniques, and various Intrusion Detection Processes and technologies that can be used for discovery of Hackers and Attacks that could threaten the Confidentiality, Integrity, or Availability of an Information System. The two basic types of Intrusion Detection: Anomaly and Misuse detection will be discussed. Case Reports will be used to discuss the various types of threats, how they can be detected, and administrative controls to reduce the likelihood of their occurrence.

CS210 FIREWALLS & INTRUSION DETECTION AND PREVENTION 2 CREDITS

Students will create and implement firewalls and IDPS using opensource software. They will learn Cisco ACLs using packet simulators like PacketTracer, Linux IP Tables, Opensource firewall Pfsense, implementing Snort IDPS and creating customized rules, Suricata, BRO and connecting it to SecurityOnion using an NSM tool. This module will allow them to build the confidence to feel comfortable working with any Firewall or IDPS system in the market.

CS215 DIGITAL FORENSICS 4 CREDITS

This course focuses on the use of the most popular forensics tools and provides specific guidance on dealing with civil and criminal matters relating to the law and technology. Students will learn how to identify, collect and preserve digital evidence and will have discussions on how to manage a digital forensics operation in today’s business environment. This course will provide theoretical as well as hands-on practical knowledge in order to perform digital investigations such as preservation, analysis and acquisition of digital information.

CS220 VULNERABILITY MANAGEMENT 2 CREDITS

Students learn to create an inventory of assets using discovery tools and domain controller queries, and how to use basic vulnerability scanning capabilities of tools like NMAP. Students will create their own NMAP scripts and learn popular industry tools like Tenable Nessus Vulnerability Management, Rapid7 InsightVM, OpenVAS, among others. To culminate the class, students learn how to make an executive report and design remediation strategies.

CS225 MALWARE ANALYSIS & INCIDENT RESPONSE 2 CREDITS

This course teaches malware analysis fundamentals including reverse engineering tools to combat malware. Participants learn to break down potential malware threats and create solutions to combat them. Students will learn to identify potentially harmful events and the difference between an incident response policy and an incident response plan. Participants will learn the best practices to build an incident response plan: prepare, identify, containment, eradication, recovery, and lessons learned.

CS230 SECURITY MONITORING 2 CREDITS

Students learn to implement a customized security monitoring service using opensource software from scratch. We start with implementing a Syslog server in Linux using Rsyslog and integrate it with the famous ELK Stack (Elasticsearch, Logstash, and Kibana) for quick insights of data. Students also learn popular tools Graylog, Splunk, and how to perform Threat Intelligence to enrich logs.

CS240 PACKET ANALYSIS 3 CREDITS

This course teaches how to analyze packets and perform network forensic investigations effectively, using open-source software. Participants also learn how to differentiate between normal vs. abnormal protocols & behaviors. We cover tools like tcpdump, Wireshark & Tshark, Snort, Bro, NetworkMinner, and others. Students learn to create simple scripts using Python Scapy, and use these skills for detecting network sniffing attacks. This module will provide students with the skills to work with raw data and have a better understanding of the underlying technologies used in their networks.

CS245 NETWORK AND SYSTEMS ADMINISTRATION 4 CREDITS

This course is an introduction to the technologies, terminology, and skills used in the world of data networking. The emphasis is on practical applications of networking and computer technology to real-world problems. Students will learn the theoretical and practical aspects of the principles and techniques used in the design of networks and the development of networked and distributed software. Thus, it summarizes the professional, ethical, and social responsibilities as they relate to technical professionals in the computer or information technology industry.

CS250 SECURITY AUTOMATION 4 CREDITS

Students will learn the necessary skills to automate security tasks by using the Python programming language. For analysts and other security professionals, automation is a fundamental tool that helps them keep up with the volume of threats and individual activities to defend the enterprise. They will learn automated data analysis, policy validation, and customized scanning. Participants will also be trained on how to use Python to automate offensive activities as a penetration tester and better understand modern-day attacks.

CS255 SECURITY AUTOMATION SYSTEM 3 CREDITS

This course is designed to offer students practical experience with the design and construction of secure computing systems. The course focuses on two main themes: (i) practical defenses for real-world attacks, and (ii) security as part of the software engineering process. Practical Security Automation and Testing helps students to build their security automation framework to scan for vulnerabilities without human intervention. Students will engage in a significant group programming project, including the use of software analysis tools.

CS280 ETHICAL HACKING AND SYSTEMS DEFENSE 3 CREDITS

This course is designed to introduce students to the fundamentals of hacking and becoming an ethical hacker. The course focuses on the code of conduct and ethics of attacking systems. The course also teaches the mindset of the hacker and evolution of the hacker. Students also gain fundamental understanding and education on the elements of compromising computer systems for the explicit purposes of securing them from hackers. The course makes a very clear distinction between criminal hacking and ethical hacking, and only teaches the latter. The course then focuses on some fundamentals of system defense, including configurations and software to prevent unauthorized system access.

CT108 INTERNET HISTORY TECHNOLOGY AND SECURITY 3 CREDITS

The impact of technology and networks on our lives, culture, and society continues to increase. The very fact that you can take this course from anywhere in the world requires a technological infrastructure that was designed, engineered, and built over the past sixty years. To function in an information-centric world, we need to understand the workings of network technology. This course will open up the Internet and show you how it was created, who created it, and how it works. Along the way we will meet many of the innovators who developed the Internet and Web technologies that we use today. After this course you will not take the Internet and Web for granted. You will be better informed about important technological issues currently facing society. You will realize that the Internet and Web are spaces for innovation and you will get a better understanding of how you might fit into that innovation. If you get excited about the material in this course, it is a great lead-in to taking a course in Web design, Web development, programming, or even network administration. At a minimum, you will be a much wiser network citizen. (Offered in the fall)

CT114 PROGRAMMING FOR EVERYONE I USING PYTHON* 3 CREDITS

This course aims to teach everyone the basics of programming computers using Python. We cover the basics of how one constructs a program from a series of simple instructions in Python. We will explore how we can use the Python built-in data structures such as lists, dictionaries, and tuples to perform data analysis. The course has no prerequisites and avoids all but the simplest mathematics. This course will introduce the core syntax, commands, and data structures of the Python programming language. Once a student completes this course, they will be ready to take more advanced programming courses.

CT121 WEB DESIGN I 3 CREDITS

In this course students will learn how to design and develop websites using the top web development languages in use today. Students will learn the fundamentals of HTML5 and CSS3 in tandem and apply them through the design, development and publishing of their own website as a final project. (Offered in the fall and spring)

CT122 WEB DESIGN II 3 CREDITS

This course introduces the student to dynamic web development using the JavaScript programming language. Students will learn to implement programming logic, define and use variables, perform looping and branching, develop user interfaces, capture and validate user input, store data, and create well-structured applications. Prerequisite: CT121 (Offered in the fall)

CT 125 WEB DESIGN

This course introduces the student to how to design and develop websites using the top web development languages, such as HTML5 and CSS3, and dynamic web development using the JavaScript programming language. Students will learn to design, develop, and implement programming logic, define, and use variables, perform looping and branching, develop user interfaces, capture and validate user input, store data, and create well-structured applications in order to publish their own website as a final project.

CT140 GOOGLE IT SUPPORT CERTIFICATE PROGRAM 6 CREDITS

Google's IT Support is a program that helps people prepare for entry-level roles in IT support with no experience or degree necessary. Through a dynamic mix of video lectures, quizzes, and hands-on labs and widgets, the Google IT Support Professional Certificate introduces learners to troubleshooting, customer service, networking, operating systems, system administration, and security. The curriculum includes motivating personal stories from Google employees, with unique backgrounds and perspectives, who started their careers in IT support. Upon completion of the certificate, learners receive a Google IT Support Professional Certificate badge they can display on their LinkedIn profiles.

CT142 FUNDAMENTALS AND APPLICATION OF C++ 4 CREDITS

This course is an introduction to problem-solving and program design using the procedural aspects of the C++ programming language. Students are introduced to programming logic and design using flowcharts and algorithm development. The fundamentals of the C++ programming language are then introduced with the student expected to apply the programming and logic design techniques to develop skills in coding concepts. The Visual C++ Integrated Development Environment (IDE) is used as the primary development tool accompanied by programming in an Arduino-based microcontroller environment for testing the programming logic on real-time electronics circuitry.

CT143 INTRO TO C++ PROGRAMMING 4 CREDITS

This course is an introduction to problem solving and program design using the procedural aspects of the C++ programming language. The fundamentals of the C++ programming language are introduced with the student expected to apply the programming and logic design methodology in solving programming problems. The MS Visual C++ Integrated Development Environment (IDE) is used as the primary development tool. (Offered in the fall and spring)

CT144 INTERMEDIATE C++ 4 CREDITS

This course is a continuation of CT143. It picks up with user developed functions including inline functions, default arguments, function overloading and function templates. Array processing is enhanced with the introduction of parallel arrays, passing arrays to functions and sorting and searching of arrays. This is followed by the C++ string class, structures, pointers and dynamic memory allocation. The course finishes up with a shift in focus to the object-oriented paradigm with an introduction to classes. The MS Visual C++ Integrated Development Environment (IDE) is used as the primary development tool. Prerequisite: CT143. (Offered in the spring and summer)

CT146 INTRO TO JAVA PROGRAMMING 4 CREDITS

This course is an introduction to the JavaScript. The fundamentals of the JavaScript are introduced with the student expected to apply the programming and logic design methodology in solving programming problems. The Eclipse Integrated Development Environment (IDE) is used as the primary development tool.
(Offered in the fall, spring and summer)

CT147 INTRODUCTION TO REACT JAVASCRIPT 4 CREDITS

This course is an introduction to REACT javaScript , from projects setup to understanding the fundamentals of JavaScript for React, we will cover everything to get you started in this new environment, how to write React in modern ES6 Javascript. The course includes Easy project setup to Create React App (you'll be running code within minutes) , learn the lifecycle of a component , through useEffect for side effects and how the input controls work in React. Prerequisite: CT122

CT148 C++ PROGRAMMING 4 CREDITS

This course is an introduction and intermediate problem solving and program design using the procedural aspects of the C++ programming language. The fundamentals of the C++ programming language are introduced, with the student expected to apply the programming and logic design methodology in solving programming problems and using user-developed functions, including inline functions, default arguments, function overloading, function templates, and array processing. The intermediate C++ language introduces the string class, structures, pointers, files, and dynamic memory allocation. The course finishes up with a shift in focus to the object-oriented paradigm with class concepts. The MS Visual Studio C++ Integrated Development Environment (IDE) is used as the primary development tool.

CT 149 REACT JAVASCRIPT 4 CREDITS

This course is all about introduction and intermediate REACT JavaScript concepts to develop single-page web applications and create reusable components for web pages. From project setup to understanding the fundamentals of JavaScript for React, we will cover everything to get students started in this new environment, including how to write React in modern ES6 JavaScript. We will also talk about React at a very high level, defining concepts like Component Architecture and One Way Data Flow. We go over each of the core concepts of React in depth and design some exercises to give students hands-on practice working with React and show some common patterns for how to use React.

CT160 NETWORKING 4 CREDITS

This course emphasizes the practical applications of networking and computer technology to real-world problems and provides in-depth, hands-on coverage of protocols and network technologies that are essential for building corporate infrastructures and seamlessly integrating them with the Internet. It also focuses on the design and implementation of state-of-the-art network architectures and solutions for enterprise networks in terms of improving scalability, reliability, and security. Its hands-on laboratory work will be done on industry-leading Cisco routers and switches. Students will develop and build small enterprise class networks.

CT165 INTRODUCTION TO NETWORKING 3 CREDITS

This course is an introduction to technologies, terminology, and skills used in the world of data networking. Emphasis is on practical applications of networking and computer technology to real-world problems. Prepares students for entry-level jobs as a networking technician and prepares them for learning more advanced topics in networking. (Offered in the fall and spring)

CT211 WEB SITE MANAGEMENT 3 CREDITS

This course provides a working understanding of two core technologies used in hosting websites on a web server. This course goes through installation of PHP and MySQL technologies on a local machine as well as hosted servers, explains basic tags, commands and constructs, and helps the student to build and work within a solid back-end database. Prerequisite: CT122 (Offered in the spring and summer)

CT212 SYSTEM MAINTENANCE AND MANAGEMENT I 3 CREDITS

This course covers the fundamental topics of PC technician training as covered by the CompTIA A+ 220-901 certification exam, including hardware, networking, laptops, printers and operational procedures. The focus of the course is split between hands-on maintenance and repair of PCs, and certification exam preparation. At the conclusion of the course students will be encouraged to attempt the 220-901 certification exam using discounted exam vouchers available through the college. (Offered in the fall and spring)

CT213 SYSTEM MAINTENANCE AND MANAGEMENT II 3 CREDITS

This course resumes study of the fundamental topics of PC technician training begun in CT212. This time the topics are those covered by the CompTIA A+ 220-902 certification exam, including operating systems, security, mobile devices and troubleshooting. The focus is again split between hands-on maintenance and repair of PCs and certification exam preparation. At the conclusion of the course students will be encouraged to attempt the 220-902 certification exam using discounted exam vouchers available through the college. Prerequisite: CT212 (Offered in the spring and summer)

CT221 ENTERPRISE DATABASE MANAGEMENT 3 CREDITS

This course provides students with an understanding of the issues in managing enterprise database systems as an essential organizational resource. Topics include the enterprise data architecture components, data storage configurations, and information retrieval methods. The course expands from the relational model to the multidimensional model, object-relational techniques, and Web-accessed data. Oracle databases serve as the primary tools for use in the course. (Offered in the spring and summer)

CT231 LINUX SYSTEM ADMINISTRATION 3 CREDITS

This course introduces the Linux file system, group administration, and system hardware controls. Topics include intermediate command-line (CLI) administration, access control, file systems, software installation and management, process control, and security. Students will write shell scripts and constructs to enhance and automate system administration activities, and, upon course completion, will be able to perform basic system administration tasks including installation, configuring and attaching a new Linux workstation to an existing network.
(Offered in the fall and spring)

CT233 WINDOWS SYSTEM ADMINISTRATION 3 CREDITS

This course presents an in-depth introduction to the core features of Microsoft servers, as covered by the Microsoft Technology Associate Exam 98-365. Topics include server installation, server roles, active directory, storage, server performance management, and server maintenance. At the conclusion of the course students will be encouraged to attempt the MTA-365 certification exam using discounted exam vouchers available through the college. (Offered in the spring and summer)

CT247 INTERMEDIATE REACT JAVASCRIPT 4 CREDITS

In this course we will review some of the important javaScript and Development Tools, we will use when working with React. We will also talk about React at a very high level, defining concepts like Component Architecture and One Way Data Flow. We go over each of the core concepts of React in depth.We will cover one topic per chapter to keep everything as simple and clear as possible, we will design some exercises to give us hands-on practice working with React and show some common patterns of how to use React. Prerequisite: CT147

CT249 CONTEMPORARY PROGRAMMING LANGUAGES 4 CREDITS

This course looks at two contemporary programming languages, Python and C#. After learning the new syntax, students apply programming techniques developed in previous courses to write programs and examine the situations for which each language is best suited. (Offered in the spring)

CT250 FUNDAMENTALS IN PYTHON 4 CREDITS

This course is an introduction to problem solving and program design using the procedural aspects of the Python programming language. Students are introduced to programming logic and design using flowcharts and algorithm development. The fundamentals of the Python programming language are then introduced with the student expected to apply the programming and logic design methodology in solving and programming problems. Topics covered : stored program concept, data types, number systems, assignment statements, input/output, decision and looping statements, library functions, user developed functions and single dimension arrays. Students will create a user library of simple functions and create an executable module using this library. Students will be exposed to Python language Sound, Animation at the end of the semester.

CT267 NETWORKING II 4 CREDITS

This course continues and builds upon the theory and hands-on laboratory work of CT165. It focuses on the design and implementation of state-of-the-art network architectures and solutions for enterprise networks. It provides an in-depth, hands-on coverage of protocols and network technologies that are essential for building corporate infrastructures and seamlessly integrating them with the Internet. Special attention is paid to essential characteristics of high-quality e-business environments, such as scalability, reliability, and security. Hands-on laboratory work will be done on industry leading Cisco routers and switches. Students will develop and build small enterprise class networks. Prerequisite: CT165 (Offered in the spring and summer)

CT269 CLOUD COMPUTING AND VIRTUALIZATION FUNDAMENTALS 4 CREDITS

This course provides an overview of enterprise cloud computing, and virtualization. Students will learn practical skills on how to install and configure virtual environments. Topics include hypervisor installation, guest operating system installation, types of cloud deployments models, cloud concepts and services, and security basics, snapshot creation, virtual machine, cloning, team management, and virtual machine networking. At the conclusion of the course, students will be encouraged to attempt Amazon Web Services (AWS) cloud certification exam to gain badge(s) or certification(s). Prerequisite: CT165 (Offered in the spring)

CT275 AGILE PROJECT MANAGEMENT 3 CREDITS

This course provides an introduction to project management. It takes a holistic, integrated approach to managing projects, exploring both technical and managerial challenges multiple industries experience in several areas of project management such as scheduling, financing, marketing, distribution, and organizational structures.

CT277 TOPICS IN NETWORK AND SYSTEM SUPPORT EMPLOYMENT READINESS 3 CREDITS

This course aims to prepare students for workplace readiness through targeted learning of skill-sets belonging to job roles associated with the Network & System Support certificate, such as Entry-level computer support specialist, Entry-level network support specialist, PC maintenance and repair technician, Entry-level system support specialist, Help Desk technician, Entry-level System Administrator, Technical/Software Support Specialist.

The course begins with an introduction to the project area and roles that serve as the focus for the semester. Students are then provided instruction in the essential skill set of each role and a range of opportunities to practice what they have learned. The course culminates with students assuming the various roles they have studied as part of a functioning team whose focus is to complete a real-world project drawn from the IT area under study. Successful students will receive recommendations for actual or prospective employment in the field.

CT278 TOPICS IN WEB DESIGN EMPLOYMENT READINESS 3 CREDITS

This course is offered to students who have achieved all content standards in a program (through web design I and II) and desire to pursue advanced study through investigation and in-depth research. Students are expected to work independently or in a team and consult with their supervising teacher for guidance. The supervising teacher will give directions, monitor, and evaluate the students' topic of study. Coursework may include various work-based learning experiences such as internships and job shadowing, involvement in a school-based enterprise, completion of a capstone project, and/or portfolio development.

CT300 DATA STRUCTURES 3 CREDITS

This course will teach students fundamental data structures using Python. Data structures allow for the storage of vast quantities of data, as well as efficient access to and modification of said data. Students will learn what a data structure is, how to perform a range of operations on them, and be introduced to the study of algorithms as it pertains to the covered data structures. Prerequisites: CT114, CT118 and MA240 (Offered in the fall)

CT301 PRINCIPLES OF ITIL 4 3 CREDITS

CT301, formerly CT1001, is an Instructor-led training course that provides learners with a comprehensive understanding of the Information Technology Infrastructure Library (ITIL) framework and its role on IT Service Management in the digital world. The course will discuss Service Value System (SVS) and the four dimensions of Service Management. Students will gain knowledge of the ITIL4 concepts and terminology, understand the link between ITIL4 and the latest best practices such as Agile, DevOps, and Lean, and the various ITIL management practices. Exercises, quizzes, tests and practice exam and preparation tips and strategy are also included in the course to help prepare learners for the ITIL4 Foundation Certification exam, which must be successfully completed in order for learner to be allowed to continue with the program. (Offered in the fall)

CT302 FUNDAMENTALS OF SQL DATABASE ADMINISTRATION AND EXCEL 4 CREDITS

CT302, formerly CT1002, is an Instructor-led training course that introduces learners to the principles of database management in modern organizations, using widely adopted Relational Database Management Systems (RDMS) such as Microsoft SQL Server 2008 R2. The emphasis is on practical database experience reinforced through assignments and laboratory work. Students learn first to work with Microsoft SQL Server 2008 R2 database system. Then, they are introduced to the design of databases and their implementation in relational systems. Topics include tables, queries, forms, reports, importing and exporting data, structured query language, entity relationship models, the relational data model, and normalization of databases. Exercises, quizzes, tests and practice exam and preparation tips and strategy are also included to help prepare learners for the Microsoft Technology Associate (MTA) Database Fundamentals certification exam. Special topics in Excel will also be covered. (Offered in the fall)

CT305 ANALYTICS AND VISUALIZATION USING POWER BI 6 CREDITS

CT305, formerly CT1004, is an Instructor-led training course that teaches learners how to use Microsoft Power BI Desktop and the Microsoft Power BI Service to connect the disparate data sources, transform and clean the data into a data model, analyze, and create visualizations of complex data as well as create and share data reports to help leaders make good decisions, which are is essential to organizational success and competitive advantage. Topics include connections to data sources, data transformations and cleansing, data modeling and visualizations, dashboard configuration, report creation, editing, and publication, and security. Exercises, quizzes, tests and practice exam and preparation tips and strategy are also included to help prepare learners for the 70-778 Analyzing and Visualizing Data with Microsoft Power BI examination.

CT310 AR & VR FUNDAMENTALS AND UNITY DEVELOPMENT 3 CREDITS

In this course, students will be able to add Unity and C# skills to their toolboxes as developers. In addition to learning how to build 2D and 3D applications and experiences within Unity, students will be exposed to Unity Services, navigating Unity documentation, preparation material for the Unity Certified Programmer Exam, VR and AR mini projects, and VR and AR Best Practices. During this time, students will also learn about what it means to be an AR/VR developer, how to understand this niche job market, and get to experiment with a few small AR and VR projects. This course is designed to set students up for part two of the class, Project Management for VR and AR Projects in Unity.

CT311 PROJECT MANAGEMENT FOR AR AND VR PROJECTS IN UNITY 3 CREDITS

In this course, in addition to continuing to learn about Unity and C#, students will practice project management skills as they work in teams to build AR and VR application prototypes for real industry partners in the community. To facilitate collaboration, they will gain practical experience using version control systems and experiment with different project management workflows in teams. Best practices for working and communicating with other developers, 3D artists, and clients will also be covered. At the very end of the course, students will start their own personal AR/VR project for their portfolio and prepare to publish it to the app store of their choice. Note: Taking Unity, C#, and VR/AR Best Practices is a prerequisite to taking this course.

CT365 NETWORK SECURITY 4 CREDITS

This course provides the skills necessary to apply and implement technical knowledge of security concepts in the security environments confronting enterprises today. Topics include systems security, access control, network infrastructure, assessments and audits, cryptography and organizational security. Students are given real world scenarios to reinforce the material covered and will learn how to apply the concepts to particular settings such as healthcare. Prerequisite: CT165 (Offered in the spring)

CT400 ALGORITHMS 3 CREDITS

This course explores algorithms from a coding-focused perspective, using Python. Students will learn about the issues that arise in the design of algorithms for solving computational problems and will explore a number of standard algorithm design paradigms and their applicability. Students will also become familiar with concepts of runtime, recursion, implementation and evaluation. This course features a heavy emphasis on practical application of algorithms to common development and engineering challenges. Prerequisites: CT114, CT118, CT300 and MA240 (Offered in the fall)

DA105 FOUNDATIONS OF DATA ANALYTICS I USING PYTHON 3 CREDITS

Foundations of Data Analytics I is based on UC Berkeley's Data 8 class. In an increasingly data-driven world, everyone should be able to understand the numbers that govern so much of our lives. Students will learn the core concepts of inference, data analysis and computing by working with real economic, social and geographic data. Particular attention will be paid to Bayes' Theorem - one of the most important concepts in applying statistics to the real world. Lastly, this course will cover the implications and dangers of bias in data. (Offered in the fall and spring)

DA110 FOUNDATIONS OF DATA ANALYTICS II 3 CREDITS

Foundations of Data Analytics II is based on UC Berkeley's Data 8 class. In an increasingly data-driven world, everyone should be able to understand the numbers that govern so much of our lives. Students will learn the core concepts of inference, data analysis and computing by working with real economic, social and geographic data. This course will also provide students with an introduction to the applications of Data Analytics in the workforce, with specific attention paid to the role of the Data Scientist or Analyst, and to the application of Big Data. Prerequisite: DA105 (Offered in the spring)

DA301 PRINCIPLES AND TECHNIQUES OF DATA ANALYTICS I 3 CREDITS

This course is based heavily on UC Berkeley's Data 100 class. Data Analytics combines data, computation and inferential thinking to solve challenging problems and understand their intricacies. This class explores key principles and techniques of data science, and teaches students how to create informative data visualizations. It also explores particular concepts of Linear Algebra which are central to Data Science. Prerequisites: DA105, DA110, MA240, CT114, and CT118 (Offered in the fall)

DA305 PRINCIPLES AND TECHNIQUES OF DATA ANALYTICS II 3 CREDITS

This course builds on Principles and Techniques of Data Analytics I to provide students with a more robust understanding of the tools of a Data Scientist. Data Analytics combines data, computation and inferential thinking to solve challenging problems to thereby better understand the world. This class explores key principles and techniques of data science, including quantitative critical thinking and algorithms for machine learning methods. It will also introduce students to the ways in which data analytics is deployed in healthcare, marketing, political science, criminal justice, and other fields. Prerequisites: DA301, DA105, DA110, MA240, CT114, CT118 (Offered in the spring)

DA420 DATA ANALYTICS PRACTICUM 3 CREDITS

This course is a capstone project in which students are asked to work through a full data science workflow on a set of real data drawn from sports, politics, business or public health. This course exists to prepare students for the kind of work they will do on Data Science or Analytics teams, and as such, also features an emphasis on interviewing for jobs in the space and communicating results to stakeholders. Prerequisites: DA105, DA110, MA240, DA301, DA305, and Data Structures. (Offered in the spring)

ECE101 DIGITAL ELECTRONICS 3 CREDITS

This course introduces the elements and tools of digital design. The course covers Boolean algebra, Karnaugh maps, Logic gates and digital circuits, analysis and design of combinational and sequential circuits, and timing issues. Adders, decoders, multiplexers, flip-flops, counters, and registers are implemented using TTL or CMOS ICs as well as VHDL-programmed FPGAs. Co-requisites: ECE101L. (Offered in the fall)

ECE101L DIGITAL ELECTRONICS LAB 1 CREDIT

Illustrates the concepts of ECE101. Exercises in various forms of Combinational and Sequential Logic design. Use of test equipment. Design projects will include a digital security system, use of PSPICE to verify feasibility of some designs. FPGA board citing Xilinx, software development tools from Xilinx and other third parties are introduced. Co-requisites: ECE101L. (Offered in the fall)

ECE105 CIRCUIT THEORY I 3 CREDITS

Basic elements and analysis techniques of DC circuits. Coverage includes resistors, capacitors, inductors, and sensors ; independent and dependent sources. Ohm's law, power, energy, and power transfer. Kirchoff's voltage and current laws; Nodal and Loop analyses; Thevenin and Norton equivalents; step and transient responses of first-order systems; time constants. Emphasis on functional circuits. Co-requisites: ECE105L, MA240. (Offered in the spring)

ECE105L CIRCUIT THEORY LAB I 1 CREDIT

The Circuit Theory Lab I is designed to supplement the Circuit Theory I course. Co-requisites: ECE105. (Offered in the spring)

ECE205 CIRCUIT THEORY II 3 CREDITS

Basic elements and analysis techniques of AC circuits. Dynamics of first and second order networks, transient responses, phasors, sinusoidal steady state analysis, steady state power analysis, magnetically-coupled devices, energy storage in elements, three phase power circuits. Offered yearly. Prerequisites: ECE105 with a minimum C grade; Corequisites: ECE205L & MA250. (Offered in the fall)

ECE205L CIRCUIT THEORY II LAB 1 CREDIT

Illustrates the concepts of ECE 205. Simulations with PSPICE, LABVIEW, Mathematica; construction and design. First order, second order transients, ideal and non-ideal transformer circuits, sinusoidal steady state circuits, three-phase simulations. Offered yearly. Corequisites: ECE205 with a minimum grade of C. (Offered in the fall)

ECE206 SOLID STATE DEVICES AND CIRCUITS 3 CREDITS

Review of Thevenin and Norton Equivalent circuits. Frequency Domain analysis and Bode Plots. Representation of an active device by its Gain, Input and Output Resistance. Thorough coverage of op amps - circuits, applications, and inherent limitations. Introduction to semiconductor physics and the PN junction. Diode circuits, applications, and models. Zener diodes and power supplies. Ripple estimations. The Bipolar Junction Transistor - large and small signal analyses. Active, cutoff, and saturation region characterization. Hybrid Pi and T models. Basic transistor configurations - common collector, common base, and common emitter - along with their characteristics, applications, and tradeoffs. Estimation of bandwidth using open circuit time constants. Prerequisites: ECE205 with a minimum grade of C. Co-requisites: ECE206L. (Offered in the spring)

ECE206L SOLID STATE DEVICES AND CIRCUITS LAB 1 CREDIT

The Solid State Devices & Circuits Lab is designed to supplement the Solid State Devices & Circuits course. Students will gain both exposure to circuits using operational amplifiers, diodes, and BJTs, and also perform design exercises using operational amplifiers and diodes. Lab concludes with a lengthier design, simulation, building, and testing of a multi-stage BJT amplifier with overall simultaneous gains of + / - 40. Prerequisites: ECE205 with a minimum grade of C. Co-requisites: ECE206. (Offered in the spring)

ECE225 LINEAR SYSTEMS WITH DIFFERENTIAL EQUATIONS 3 CREDITS

Introduction to linear differential equations, linear algebra, signals and systems, time domain analysis of continuous and discrete linear systems, Laplace transform, Bode Plots, Fourier series, Fourier transforms, and filtering. Prerequisites: MA250 and ECE205 with a minimum grade of C; Corequisites: ECE225L. (Offered in the spring)

ECE225L LINEAR SYSTEMS WITH DIFFERENTIAL EQUATIONS LAB 1 CREDIT

The lab is designed to supplement the course. Mathematica® used to solve problems, demonstrate concepts. Labview® and hardware implementation of linear systems. (Offered in the spring)

ECE270L STATISTICS FOR ENGINEERS LAB 1 CREDITS

This lab is designed to give engineering applications of statistics and must be taken after taking MA270. Includes three week long experiment on whisker resonance. Includes derivations of statistical theorems, discrete distributions, continuous distributions, bivariate distributions, correlation, Central Limit Theorem, Monte Carlo simulations, confidence intervals, hypothesis testing, and linear regression. Uses Mathematica software. Prerequisite:MA270, MA250 Calculus II. (Offered in the fall)

ECE306 SOLID STATE DEVICES AND CIRCUITS II 3 CREDITS

This elective course is an extension of ECE 206. A comprehensive study of field effect transistors (FETs), including physical structure and regions of operation, DC biasing circuits design and analysis, ac small signal equivalent circuit, switching and amplifier applications. Design and analysis of common-source, common-gate, and source follower amplifiers using FETs. Differential amplifiers and current source design using FETs and BJTs. Bode Plots. Low and High frequency characteristics and compensation techniques for transistor amplifiers. Cascade, cascode, and multi-stage amplifier design. Prerequisites: ECE 205 Circuit Theory II and ECE 206 Electronic Devices I with minimum grades of C; Course tightly coupled to ECE306L. (Offered upon demand)

ECE306L SOLID STATE DEVICES AND CIRCUITS LAB II 1 CREDIT

Lab exercises parallel lecture material. Applications of FETs. FET amplifiers. Current sources and. Differential amplifiers. Frequency compensation techniques using simulations. Corequisites: ECE 306

ECE307 ELECTRIC POWER SYSTEMS 4 CREDITS

This course is a first step in understanding the components that compose the high power grid and how they are modeled. One and Three Phase Signals; Real and Reactive Power along with compensation techniques; Star and Wye Configurations; Transformer Operation and Equivalent Circuit modeling; Synchronous Machines; Analysis of Transmission lines for Short, Medium,and Long Lengths; Analysis of Power Flow on Transmission Networks; Newton-Raphson and Gauss-Seidel Methods; Possible Introduction to Faults and Network Analysis (time permitting). . A strong emphasis placed on problems solving and representative exercises. Prerequisites: MA250, ECE205, ECE206. ECE403 helpful, but not required. (Offered in the spring)

ECE308 POWER ELECTRONICS 4 CREDITS

Power Electronics role in todays world; Switching Conversion and Analysis Tools – Switch matrices; KVL and KCL constraints; Source Conversion; Averaging assumptions; Switch types; DC-DC Converters -direct, indirect, buck, boost, buck-boost; DC-DC transformers; AC-DC Converters; Switched Capacitor Circuits; DC-AC Converters (Inverters). Multiple studies and examples of analysis and design with representative exercises. Prerequisites: MA250, ECE205, ECE 206 with a minimum grade of C; ECE 307 desirable but not required. Corequisites: ECE L308

ECE308L POWER ELECTRONICS LAB 1 CREDIT

Lab will focus primarily on gaining hands on experience with the concepts taught in ECE 308 Lecture. Will include exposure to Power Electronics devices (but at a modest Power level) – Mosfets, BJTs, SCRs, Triacs, IGBTs, and testing of Power Converter Modules. Design and Construction of a Buck and Boost Converter will be required. Prerequisites: MA250, ECE205, ECE 206 with a minimum grade of C; ECE 307 desirable but not required. Corequisites: ECE 308

ECE309 LABVIEW AND ELECTRIC CIRCUITS AND MACHINES 3 CREDITS

The purpose of this elective course is twofold: to give students facility in programming and data acquisition in Labview, and to use Labview to learn about power concepts such as three-phase, power corrections, per units, Star (Wye) and Delta connections, magnetic circuits, power electronic circuits, electric machines. Lab component reinforces concepts taught in course. Prerequisites: ECE 205 with a minimum grade of C;, ECE 206 (Offered upon demand)

ECEL309 LABVIEW AND ELECTRIC CIRCUITS AND MACHINES 1 CREDIT

Lab component reinforces concepts taught in course. Co-requisite: ECE 309 (Offered upon demand)

ECE311 EMBEDDED SYSTEMS 3 CREDITS

This course will introduce the fundamentals of embedded micro controllers for system level applications: fundamental elements - sensors or transducers, microcontrollers, and the interfacing to external components. Procedural methods for design of the complete embedded system are developed. Programming using assembly, and C languages is utilized. Prerequisites: ECE101 and ECE206 with a minimum grade of C. CT143, CT146 or CT333 with a minimum grade of C; Co-requisites: ECE311L. (Offered in the fall)

ECE311L EMBEDDED SYSTEMS LAB 1 CREDIT

The Embedded Systems Lab is designed to supplement the Embedded Systems course. Prerequisites: ECE311. (Offered in the fall)

ECE 325 STATISTICS FOR ELECTRICAL ENGINEERS 3 CREDITS

This calculus-based course provides students with solid foundations in descriptive and inferential statistical methods, and the role probability plays in applying them. Some topics include graphical summaries of data, measures of central tendency, variability, and relative position; random variables, discrete and continuous probability distributions; conditional and marginal probability distributions; simulation methods; estimation and hypothesis testing, including analysis of variance and regression. Examples focus on common applications and scenarios in electrical engineering.

ECE 325L STATISTICS LAB FOR ELECTRICAL ENGINEERS 1 CREDIT

Most decisions in the world of engineering are based on what is learned in theory and consideration of real-world observations and experience. The lab course gives students experience to reinforce topics covered in the ECE 325 course by applying the concepts of descriptive and inferential statistics, simulations,and regression modeling in a hands-on setting using statistical software. Prerequisites:MA 250: Calculus II

ECE335 CONTROL SYSTEMS 3 CREDITS

Introduction to feedback control systems; control system characteristics (stability, sensitivity, disturbance rejection, steady-state accuracy, transient response); stability analysis; root-locus analysis and design; frequency-response analysis and design; analysis and design of digital control systems. Prerequisites: ECE225 with a minimum grade of C. Co-requisites: ECE335L. (Offered in the spring)

ECE335L CONTROL SYSTEMS LAB 1 CREDIT

The Control Systems lab is designed to supplement the Control Systems course. Co-requisites: ECE335. (Offered in the spring)

ECE 345 RENEWABLE ENERGY PROCESSES AND SYSTEMS 3 CREDITS

An introductory, special topics course that addresses the technologies and implementation of sustainable energy sources and systems, including renewable energy processes that utilize solar, wind, wave, tidal, biomass, hydroelectric, geothermal, photovoltaic, hydrogen-cell, and thin-film technologies to produce energy in a sustainable manner. Material to be covered includes basic concepts, an energy industry overview, thermal energy converters, fuel cell technology, solar energy, wind and water technologies, and factors governing energy issues

ECE390 DATA & COMPUTER COMMUNICATIONS 3 CREDITS

Basic principles and topics in data communication, local area networks, wide area networks, communication architectures and protocols. Data transmission, encoding, multiplexing, circuit switching, packet switching, frame relays, and asynchronous transfer mode are also discussed. The TCP/IP protocol suite is studied and a project involving configuring, implementing, and installing a network is carried out during the semester. Prerequisite: ECE 225 or instructor's approval. 1 term - 3 credits. Must be taken concurrently with ECE L390. (Offered in the spring)

ECE390L DATA & COMPUTER COMMUNICATIONS 1 CREDIT

The Data and Computer Communications lab is designed to supplement the Data and Computer Communications course. Co-requisites: ECE390. (Offered in the spring)

ECE403 APPLIED ELECTROMAGNETICS 3 CREDITS

Electrostatics and magnetostatics, including Coulomb's law, Gauss's law, Biot-Savart law and Ampere's law, vector operations in rectangular, cylindrical, and spherical coordinates, divergence theorem and Stokes theorem, electric fields in materials, Lorentz force, magnetic torque, Faraday's law, Maxwell's equation, wave propagation, transmission lines with Smith charts, rectangular waveguides, Hertzian dipole antenna; examples related to power when applicable. Prerequisites: ECE205 and MA260 with a minimum grade of C; Co-requisites: ECE403L (Offered in the spring)

ECE403L APPLIED ELECTROMAGNETICS LAB 1 CREDIT

The Applied Electromagnetics Lab is designed to supplement the Applied Electromagnetics course. Co-requisites: ECE403. (Offered in the spring)

ECE406 SOLID STATE DEVICES & CIRCUITS III 3 CREDITS

This course is an extension of ECE 206. Advantages of feedback. Reduction of four fundamental feedback configurations to simplistic format. Loop gain and stability issues. Gain and phase margin. Frequency compensation techniques. Class A, B, and AB amplifier output stages. Power BJT applications and thermal issues. Voltage mode op amp design - small signal, gain, and frequency analysis. Current mode op amp design. A/D and D/A converters. Design of active filters, LCR resonator circuits. BiQuad filters. SAB filters. Switched capacitor filters. Tuned amplifiers and transformers. Oscillator design - Wien Bridge, phase shift, quadrature, Colpitts, Hartley, crystal, and multivibrators. Prerequisites: ECE 205 Circuit Theory II and ECE 206 Electronic Devices I

ECE406L SOLID STATE DEVICES & CIRCUITS III LAB 1 CREDIT

Illustrates the concepts of E406. Dependent sources. PSPICE confirmation of feedback circuits. Output gain stages and cross-over distortion. Oscillator design. Final project includes design, simulation, and construction (using discrete parts) of either a voltage mode or current mode op amp with an objective of maximum bandwidth with unity gain stability. Co-requisite: ECE406

ECE410 COMMUNICATION SYSTEMS 3 CREDITS

Coverage of a variety of basic communication systems, their theory of operation, and the analysis of their performance. Review of linear systems, Fourier and Laplace Transforms, and Frequency Domain analysis as needed. Graphical convolution of analog signals. Digital Baseband modulation techniques. Receiver design with an introduction to Stochastics. Digital Bandpass modulation and demodulation techniques. Analog communication systems including AM, FM, and PM approaches. Consideration of Noise and the resultant system performance. Multiplexing and information compression. Prerequisites: ECE206, ECE225 and MA260 with a minimum grade of C; Co-requisites: ECE410L. (Offered in the spring)

ECE410L COMMUNICATIONS SYSTEMS LAB 1 CREDIT

Illustrates the concepts of ECE410. Exercises will focus both on communication system components and in the construction of a complete communication system. Introduction to FSK, DTMF, Phase lock loops, AM and FM modulation, oscillators, A/D and D/A conversion and the Nyquist rate. Wireless transmissions. Troubleshooting of non-working systems. Students have flexibility in the design and construction a full communication system which includes digitization, rearrangement in parallel and serial formats, transmission over a distance, and reconstruction back to its original analog form. Co-requisites: ECE410. (Offered in the spring)

ECE414 SENIOR PROJECT PROPOSAL 1 CREDIT

The aim of this course is for students to generate a thoughtful and well -written senior project proposal. This course will provide guidelines and critiquing for that purpose. By the end of the course, students will have narrowly identified their project, performed a review of current available related technology, and selected the approach they will pursue. They will also establish a parts list, timetable, set of milestones, and basis or procedure for determining an answer to the question how good is it? At the end of the course they will formally present their project and write a comprehensive project proposal document. Once accepted, they are permitted to take ECE415 Senior Project. Note that this course is focused on the process of creating a viable proposal. The project should incorporate appropriate engineering standards and be defined sufficiently to include multiple realistic constraints. Enough flexibility exists that students may either implement the project they documented in this course when they take ENS415, or may pursue an alternative project if desired. Prerequisites: ECE101, ECE206, MA240 (Offered in the fall and spring)

ECE415 SENIOR PROJECT 4 CREDITS

For the senior project the student implements, documents, and presents their completed project of the proposal generated in ECE414. Having defined their project, students gather the resources necessary and proceed to execute their designs. The project should incorporate appropriate engineering standards and respect realistic constraints (be viably achievable within the given time and be well defined in its scope). The implementation period will include the construction, testing, troubleshooting, refinement, and evaluation of their project. A formal presentation of the project is made. A professional caliber documentation of the project is also required, and may go through numerous iterations of review. The final project report must consider most of the following: environmental impact, sustainability, manufacturability, ethics, health and safety issues, and political concerns. Time management, prioritization of process, formal communication, overcoming obstacles and meeting deadlines are monitored by the project advisor. Weekly reports and meetings are expected. The advisor also serves as a resource for the student. However, full responsibility for the success of the project rests on the student. Cross disciplinary projects are encouraged. Prerequisites: ECE414. (Offered in the fall and spring)

ECE430 DIGITAL SIGNAL PROCESSING 3 CREDITS

Discrete signals and systems, digital simulation of analog systems, Z transforms, recursion equations, finite-order systems, Fourier transforms, line spectra and Fourier series, discrete Fourier series and Fast Fourier Transforms (FTT), sampling and interpolation, mean-square approximations, non-recursive and recursive filters, selected topics on algorithms, design and applications of digital signal processing. There will be an end-of-semester design project that will involve students' creativity, design of open ended projects, formulation of alternative solutions, detailed system description, realistic constraints (economic factors, safety, reliability, aesthetics ethics, and social impact). Prerequisites: ECE101, ECE225 with minimum grade of C; Co-requisites: ECE430L. (Offered in the fall)

ECE430L DIGITAL SIGNAL PROCESSING LAB 1 CREDIT

Illustrates the concepts of ECE430. This laboratory course uses MATLAB, Simulink, and the Texas Instruments 6713 DPS board to design, test and implement various projects. The students will also learn how to use FPGA boards to design and implement various DSP systems. There will be a design project at the end of the course designed to synthesize what the students have learned. Co-requisites: ECE430. (Offered in the fall)

EE101 MOTORS AND CONTROLS 4 CREDITS

This course serves as an introduction to what motors are and how they work. The history of electric motors, the methods of operation of motors, structural features and applications of motors are covered in detail. The operational and control aspects of DC/AC motors, stepper motors, linear motors and servo motors are discussed. Additionally, real-world applications of electric motors and microcontroller-based programming of motors are systematically covered. (Offered in the fall and spring)

EE105 INTRO TO ELECTRICITY 4 CREDITS

This course provides a foundation in electrical theory and applications that are pertinent to renewable energy and power generation systems. Topics in this course include fundamentals of electrical components, electrical measurements, direct current (DC), alternating current (AC), batteries, motors, inverters, controllers, and their applications. The lab component of this course covers the hands-on and simulation based training of handling and operations of DC and AC circuitry. Students will gain an understanding of theory by means of experimental lab projects while utilizing various instruments for testing and diagnosis of basic DC and AC circuits. (Offered in the fall and spring)

EE122 ELECTRONICS I 4 CREDITS

Basic electronics including energy levels and bands, semiconductor construction, electron-hole conduction characteristics and areas of application of various bipolar semiconductor devices. Application of diodes and rectifier circuits and filters. Transistor operation analysis for common emitter configurations. Topics include DC biasing arrangements, stabilization methods for DC operating point and AC gain, input impedance and output impedance. Prerequisites: EE101, MA120; Co-requisite: MA130 (Offered in the spring and summer)

EE131 DIGITAL PRINCIPLES 4 CREDITS

An introductory course in digital concepts, which includes number systems, codes, Boolean algebra, Karnaugh maps, gating circuits, characteristics and properties of integrated circuit logic families, logic circuit analysis and logic circuit design. Types of flip-flops, counters, registers and their applications are explained. A weekly laboratory enables the student to apply the principles taught in the theory portion of the course. Prerequisites: complete MA105 with a GPA of at least 2.00. Co-requisites: EE101, MA120 (Offered in the fall and spring)

EE210 INTRODUCTION TO ROBOTICS 4 CREDITS

The emphasis in this course is on the software, hardware, and fundamental concepts of automation. The first part of the course will focus on how PLC's and Ladder Logic are used to control industrial processes and manufacturing. An introduction to different types of motors and sensors is given. We will build and control entire systems including robots using microcontrollers. Prerequisites: None.. (Offered in the spring)

EE220 INDUSTRIAL ROBOTICS SYSTEMS 4 CREDITS

This course is a continuation of the work done in EE210. We will learn more advanced PLC instructions as well as work on and build more complicated systems. Prerequisites: EE210. (Offered in the spring)

EE223 ELECTRONICS II 4 CREDITS

This course will analyze bipolar differential amplifiers, operational amplifiers, feedback, class A, B, and C power amplifiers, and single stage FET amplifiers. The advantages and disadvantages of each will be discussed, including costs. Prerequisites: EE122, MA130 (Offered in the fall)

EE225 AUTOMATION/INTRODUCTION TO PLCS 4 CREDITS

This class will introduce the concepts of fundamentals of logic and basics of programmable logic controllers. Students will practice the design, development, simulation and analysis of wiring diagrams and ladder logic programs. The course will cover various programming techniques, control instructions, digital logic level manipulations, relay operations, timers and counters. The use of industry standard PLC equipment will provide practical experience to students. Prerequisites: MA130, EE131. (Offered in spring)

EN091 READING AND WRITING FOR ACADEMIC SUCCESS 4 CREDITS

This Academic Development course integrates the growth of critical reading strategies in addition to academic writing and language skills. Students are introduced to the writing process and a deeper understanding and application of academic writing conventions. In order to enhance their participation in an academic environment, students will develop critical reading, thinking, note taking and writing skills by working through high-interest readings. (Offered in fall, spring, and summer)

EN099 INTRODUCTION TO ORAL COMMUNICATIONS 3 CREDITS

This course is intended to provide students with a basic understanding of the communication process and to enable them to develop their communication competence in various contexts. We will study the styles of speech used in these contexts, and will explore issues of audience, purpose, and tone. The course aim is to develop an awareness of the many ways in which we communicate with one another, and to promote confidence and overall speaking skills. The course will provide numerous and varied opportunities for students to practice communication techniques. At the conclusion of the course, all students should be knowledgeable of the elements of effective communication and capable of recognizing and participating in varied contexts. Co-requisite: EN091. (Offered in the fall and spring)

EN112 INTRODUCTION TO PROFESSIONAL COMMUNICATIONS 3 CREDITS

This course provides a basic understanding of the professional communication process and builds competence as workplace communicators through a review of foundational communication modes and technologies. Projects are centered around gathering, organizing, and presenting written, oral, and visual information and team-building skills are developed through collaborative learning. Group dynamics, cross-cultural communication, and conflict resolution are emphasized throughout the course.

EN129 COLLEGE COMPOSITION I WITH SKILLS PRACTICUM 4 CREDITS

This version of College Composition I follows the same curriculum as our traditional EN 130 course but includes a skill-building practicum component. The practicum, which meets for 1.5 hours each week, targets and strengthens specific skills needed to be successful in English courses at Franklin Cummings Tech and beyond. During these sessions, students engage in an active learning environment designed to bolster their reading, writing, research, and presentation skills. EN 129's non-practicum sessions invite students to investigate the ways in which language and information literacy are used in various settings. By examining how language is connected to issues of identity, and how information literacy connects to both personal and professional life, students see the importance of using spoken and written communications appropriate to various situations. EN 129 focuses on three main projects: a memoir where students explore the formation of their identities, and two ethnographic studies where they look closely at two distinct communities, one informal and one professional, to see how people interact in those settings.

This course calls for frequent informal written responses that build toward larger formal texts. Students approach writing as a process through revision and metacognitive reflection. They receive feedback on all written work from their instructors and classmates to aid these processes. (Offered in the fall and spring)

EN130 COLLEGE COMPOSITION I 3 CREDITS

This course invites students to investigate the ways in which language is used in various settings. By examining how language is connected to issues of identity, students see the importance of using spoken and written communications appropriate to particular contexts. The course is structured around three main projects: a memoir where students explore their own experiences with language and identity, and two ethnographic studies where they look closely at two distinct communities, one informal and one professional, to see how people interact in those settings. The course calls for frequent informal written responses that build toward larger formal texts. Students are invited to become reflective of their writing processes as they are involved in a constant process of revising. They receive feedback from their instructor and classmates, and discuss many ideas and concepts in groups. (Offered in the fall, spring, and summer)

EN140 COLLEGE COMPOSITION II 3 CREDITS

A continuation of College Composition I, this class considers many written genres while focusing on such issues as work, social class, culture, and identity. By examining these issues through the genres of journal articles, oral history, narrative, short story, poetry, drama, and film, students will build on their abilities to work reflectively, develop their responses, and incorporate the voices of others into their own texts through the use of quotations. Students will have the opportunity to write texts similar to the ones they are reading, as well as academic essays. Through the practice of close reading and expository writing, students will develop the ability to comment on not only specific genres, but also on the world around them. They will also have the opportunity to participate in the kinds of group and presentational work that might be practiced in a professional setting. Prerequisite: EN130 (Offered in the spring and summer)

EN320 TECHNICAL COMMUNICATION 3 CREDITS

Principles of effective communication on both the employee and organizational levels are emphasized in this course. Students create professional written documents and there is a strong emphasis on oral communications. Through class discussions, working groups, and formal presentations, students will consider and present on various workplace scenarios. These situations will provide students the opportunity to practice negotiation, conflict management, ethical decision-making, leadership roles, and presentation skills. Professionalism in all forms of communication will be expected. (Offered in the fall and spring)

ENS103 INTRODUCTION TO ENGINEERING 4 CREDITS

This six-hour course provides exposure to electrical engineering concepts, devices, tools, and its role in addressing global needs such as climate change, health, and innovation. It strives to provide an intuitive understanding and appreciation of the field and its building blocks and principles. The course is divided into three modules, each taught weekly by a different faculty member.

Module 1 starts by discussing what electricity is and how it is made; key foundation principles and various common components (batteries, resistors, capacitors, inductors, magnetism, diodes, transistors, ICs) with emphasis on intuitive appreciation of their usage. It also provides an introduction to robotics construction and Arduino programming with friendly competitions using the robots for various tasks such as accurately generating a pattern, obstacle avoidance, and maze navigation. Students will often cooperate in small teams of 2 or 3. Emphasis is placed on learning to think as an engineer - assessment of problems, candidate solution tradeoffs, and implementations.

Module 2 emphasizes the important electrical engineering devices with modern electrical engineering tools, that can be used to address global warming, . It provides team-based hands-on experiments using LabVIEW with MyDAQ's and Vernier sensors that introduce the students to electric motors, generators, LED's, and sustainable generators such as wind turbines, and photovoltaic cells. Analyses done with Mathematica and EXCEL. Voltage, current, and power concepts are emphasized. Final project is a student-designed experiment to teach high school students about sustainable energy. A trip to visit MIT's nuclear reactor is also part of the course.

Module 3 teaches the important electrical engineering tools that students will use throughout their undergraduate careers and beyond, such as test equipment, simulation tools, problem solving, creative thinking, and even having fun with mathematics.

PreRequisites – none except curiosity and a willingness to apply oneself.

ENS202L ENGINEERING TECHNICAL COMMUNICATION 4 CREDIT

Emphasis on clarity, precision, accuracy, and conciseness in scientific writing. Assignments include a team-based design-contest proposal, an oral presentation on current scientific topics, a team-based design of an experiment with a write-up and an oral presentation, a paper on engineering ethics concerning the Challenger and an instruction manual. Memo writing, summary writing, and resumes are also included. Prerequisites: EN140, PH223 & PH225 (Offered in the fall)

EN387 CREATIVE WRITING & THE ART OF PUBLIC STORYTELLING 3 CREDITS

This course will break the art of storytelling down into practical techniques and strategies. Students will learn how to put creative ideas into a form, how to find the most effective voice and/or viewpoint, how to craft suspenseful scenes so that they move a story forward, how to create story people with real emotions so that readers will care about them, how to structure a story, and finally how to connect with readers.

EN410 THE SIXTIES MEMOIRS: DOCUMENTARY, YOUTH & THE CITY 3 CREDITS

This seminar in history and documentary film explores personal narrative and how individual experience contributes to profound social change. We study 1960s youth through oral history,

biography, memoir, ethnography and journalism. Trenton NJ is the case study. Themes include civil rights & Black power; immigration & migration; student uprisings & policing; gender & sexuality; high school & college; churches & city institutions; sports & youth culture; labor, class & neighborhood; politics & government. Working with documentary narrative, the course asks how a new generation of storytellers will shape public conversations and policy

EV101 INTRODUCTION TO ELECTRIC VEHICLES CREDITS 4

Introduction to Hybrid and Electric Vehicles (H/EV) will provide students with a thorough and detailed introduction to H/EV technology, with the focus on how systems are designed, rationale for the design, powerflow, environmental impact, hazards of high voltage systems, other safety issues and your personal protection. Material covered includes, specialized tools, high voltage battery safety, safety procedures, H/EV maintenance and diagnostics, internal combustion engine (ICE).

EV107 INTRO. TO EV CHARGING STATIONS CREDITS 4

Introduction to the batteries will provide students with the terminologies and battery theory which are essential and the cornerstone of electromobility and renewable energy, the main drivers of sustainable development. Learning the fundamental lessons of the electrochemical cell and lithium ion battery, understanding the main li-ion battery driving forces, and gaining the basic knowledge of the battery will build your basic all-around comprehension of the subject. The main focus of the specialization is on batteries - namely, lithium-ion batteries, battery design, and development in electric vehicles as the key market. However, you can apply the same knowledge to other applications as well.

EV211 BATTERY TECHNOLOGY CREDITS 4

The EV Charging Station Course will provide students the necessary training to test and maintain a variety of non-networked and networked level 1,2 and 3 charging station. It is important to know about the maintenance and repairs that this equipment requires in order to function efficiently and effectively for the duration of its lifespan. Training includes charging stations hardware, safety, grid integration measures, inverters, troubleshooting and more. Note: This is not a charging station installation course. Installations need to completed by a licensed electrician.

EV214 HIGH-VOLTAGE MANAGEMENT CREDITS 4

This course will provide you with a firm foundation in lithium-ion cell terminology, function and in battery-management-system requirements as needed by H/E Vehicles. Topic will include, Battery Management System Technology, functional requirements of a BMS controller, Thermal Management system design basics, Safety Functions of a Battery management system, control and current measurement functions of the Battery management system.

HI110 US HEALTHCARE FUNDAMENTALS 3 CREDITS

This course provides an introduction to the multiple systems that define, describe, and shape the delivery of healthcare in the United States. Using case studies and presentations of major issues, this course will give the learner an appreciation of the dilemma confronting policy makers, providers, and patients: how to balance cost, quality, and access. We will examine specific healthcare issues such as access and disparity, healthcare professions, facilities, managed care organizations, and government healthcare programs. We will also discuss the impact of policy changes on American healthcare in the past century. (Offered in the fall and spring)

HI120 MEDICAL TERMINOLOGY ESSENTIALS 3 CREDITS

This course is designed to introduce the student to medical terms, including roots, prefixes, and suffixes, with emphasis on spelling, definition and pronunciation. This course introduces the student to the basic rules for interpreting, constructing, and spelling medical terms. Emphasis is upon learning word roots, prefixes and suffixes and how they are combined rather than learning each individual term. (Offered in the fall and spring)

HI130 INTRODUCTION TO HEALTH INFORMATION TECHNOLOGY 4 CREDITS

This course is designed to explore the use of information systems in healthcare. Students will be introduced to the information systems and their applications in healthcare. The fundamentals of information systems, including Electronic Health Record, will be explored. Students will become familiar with information systems used for managerial and clinical support. Information security will be discussed. (Offered in the fall, spring and summer)

HI210 HEALTH IS IMPLEMENTATION AND WORKFLOW ANALYSIS 4 CREDITS

This course explores the implementation lifecycle and workflow analysis of health information systems (HIS), necessary to achieve optimal automation of clinical work processes. Topics such as HIS planning, stakeholders, change management, readiness assessment, flowcharting, functional requirements, usability, request for proposal, systems selection and acquisition, training strategies, and quality improvement will be covered in the context of the Meaningful Use, whose name was changed in 2018 to Promoting Interoperability Programs. Implementation frameworks, successes, and failures in deploying HIS will be used as examples. Prerequisites: HI110 and HI130 (Offered in the fall)

HI300 CURRENT ISSUES IN HEALTH CARE 3 CREDITS

The aim of this course is to explore current topics in health care with a focus on the U.S. health care system, its components, and the policy challenges created by the organization of this system. Special attention is given to health policy in the context of the current reform efforts, their impact on major health policy institutions and important issues that cut across these institutions. Prerequisite: HI110 (Offered in fall)

HI310 MEDICAL CODING, CLASSIFICATION AND COMMUNICATION 3 CREDITS

This course introduces students to the study and practice of procedural medical coding using ICD-9-CM and ICD-10- CM (Revisions 9 and 10 of the International Classification of Diseases), and CPT (Current Procedural Terminology). Topics include ICD and CPT coding rules, conventions, and guidelines in complex case studies. Additional topics include the investigation of government regulations and changes in healthcare reporting. Prerequisite: HI120 (Offered in the spring)

HI320 LEGAL AND ETHICAL ISSUES IN HEALTH IT 3 CREDITS

This course introduces the student to the study of legal and ethical principles related to patient care and health information; legal terminology and procedures; court systems; and liability of health care providers. Legal requirements governing policies designed to safeguard and maintain health information, including how to appropriately respond to requests for patient specific information will be explored. Students will explore ethical issues and apply a decision making model to selected case studies. Prerequisites: HI110 and HI130 (Offered in spring)

HI330 INTRODUCTION TO HEALTHCARE DATABASES 4 CREDITS

This course introduces students to the principles of data management in the context of Health Information Technology (HIT). The emphasis is on practical database experience reinforced through assignments and weekly laboratory work. Students learn first to work with Microsoft SQL Server 2008 R2 database system. Then, they are introduced to the design of databases and their implementation in relational systems.. Topics include tables, queries, forms, reports, importing and exporting data, structured query language, entity relationship models, the relational data model, and normalization of databases. Examples, assignments, and laboratory work are drawn from hospital and other HIT environments. Students will be prepared to take the MTA 98-364 exam in-house. Prerequisites: CT221 and HI210 (Offered in the fall)

HI410 HEALTH INFORMATION SYSTEMS INTEGRATION 4 CREDITS

This course focuses on teaching students Health Level 7 (HL7), which is one of the most common health care messaging and data exchange standards. Students also learn how healthcare interoperability, six categories of standards, controlled vocabularies, and message and document exchanges help with achieving greater health information availability, which will lead to the reduction of medical errors, and the enhancement of care quality. Students are given hands-on experience with learning HL7 messaging for many different scenarios, and creating their first HL7 message. Prerequisite: HI330 (Offered in the spring)

HI430 HEALTHCARE COMPLIANCE 3 CREDITS

This course will cover the fundamentals of healthcare compliance administration from an IT perspective. A major focus of the course will be a thorough understanding of the HIPAA privacy laws as related to the role of HIT professionals. Specific topics include network and email security as related to healthcare compliance under HIPAA. (Offered in the fall)

HI445 PROFESSIONAL EXPERIENCE (PRACTICUM) 4 CREDITS

Students are placed in a hospital information technology (or other suitable) department to gain experience in a professional working environment. Students are responsible for various assigned duties depending on the placement. Prerequisites: HI330, SS335, and HI430 (Offered in the spring)

HI490 CAPSTONE PROJECT 4 CREDITS

In this course students work in teams to design and complete a full semester project in Health Information Technology. The course will guide students in defining a complex problem and developing a workable solution. The professor will identify an array of potential project areas for student consideration, who will then be assigned an area based on preference, skills and team size. To the degree possible, students will get their top choices of project areas. Prerequisites: HI330, SS335, and HI430 (Offered in the spring)

HV100 HVAC&R 1ST SEMESTER 13 CREDITS
FUNDAMENTALS OF ELECTRICITY AS APPLIED TO HVAC-R

This course is designed to explore the sources and principles of electrical energy and magnetism, and its control. Students will learn how to apply safety procedures while working with electricity, electrical devices, and equipment. They will learn to distinguish the difference between series and parallel circuits and how to apply principles of electricity to electrical formulas as they relate to basic circuits and equipment. Students will also learn to apply automatic controls used in the HVAC&R industry. They will learn the various types and applications of electric motors and controls used in the industry. In addition students will learn to diagnosis and troubleshoot electric motors, circuits and controls. In the process they will learn to use various types of testing equipment. The OSHA 10 hour certification is administered in this course as well. Prerequisites- None. (Offered in the fall and spring)

HV111 FUNDAMENTALS OF ELECTRICITY AS APPLIED TO HVAC-R 4 WEEKS 4 CREDITS

This course is designed to explore the sources and principles of electrical energy and magnetism, and its control. Students wil learn how to apply safety procedures while working with electricity, electrical devices, and equipment. They will learn to distinguish the difference between series and parallel circuits and how to apply principles of electricity to electrical formulas as they relate to basic circuits and equipment. Students will also learn to apply automatic controls used in the HVAC&R industry. They will learn the various types and applications of electric motors and controls used in the industry. In addition, students will learn to diagnosis and troubleshoot electric motors, circuits and controls. In the process they will learn to use various types of testing equipment. The OSHA 10-hour certification is administered in this course as well. Prerequisites- None. (Offered in the spring and summer)
(Offered in the fall and spring)

HV112 FUNDAMENTALS OF REFRIGERATION 4 WEEKS 4 CREDITS

This course is designed to present the student with the principles and basic operation of refrigeration systems and the refrigration cycle. They will learn about the laws of thermodynamics as applied to refrigeration, different refrigerants and their applications, compressors, evaporators, condensers, metering and control devices and their operation within the refrigeration system. Students will learn how to plot refrigeration pressures for refrigerants on a pressure/temperature chart. (Offered in the fall and spring)

HV113 ELECTRICAL AND MECHANICAL FOR REFRIGERATION 6 WEEKS 5 CREDITS

This course is designed to familiarize students with the electrical and mechanical aspects of a refrigeration system. Wiring shematics for refrigeration units will be studied in depth and applied to refrigeration trainers as well as the operation, installation, and functions of different mechanical components. Students will also be introduced the different types of temperature and pressure controls of a refrigeration system and their roll within the system. Students will also learn basic service procedures such as, system charging and evacuation, superheat and subcooling, leak testing procedures, tubing and piping techniques, as well as pump down systems, and domestic refrigeration. (Offered in the spring and summer).

HVAC&R INTERSESSION 2WEEKS/ 2 CREDITS

HV-114 EPA REFRIGERANT RECOVERY, RECYCLE, AND RECLAIM 2 WEEKS 2 CREDITS

Recovery, Reclamation and Recycling Program: this course concentrates on Federal EPA certification test preparation and exam, R410A certification, and the use of recovery equipment.

HV-200 HVAC&R SECOND SEMESTER- 14 WEEKS 13 CREDITS

HV211 COMMERCIAL REFRIGERATION AND ICE MACHINES- 3 WEEKS 3 CREDITS

Students will study commercial applications of evaporators and condensers as applied to commercial refrigeration including ice machines and walk-in units. This course will also include different types of expansion devices for these applications, special refrigeration systems, troubleshooting and typical operating conditions.
(Offered in the spring and summer)

HV212 COMMERCIAL AIR CONDITIONING AND HEAT PUMPS -3 WEEKS 3 CREDITS

This course is designed to provide the student with the necessary information about the various types of air conditioning systms such as package roof top systems, chillers/cooling towers, geothermal and mini split heat pumps, and their characteristics and applications. This course also explores the servicing and troubleshooting of systems and controls. Students will learn the parameters associated with psychometrics, the process involved in installing an air conditioning or heat pump system, and the conditions that affect these systems. Students will also learn factors involved in comfort and plot air conditions using a psychometric chart. (Offered in the spring and summer)

HV213 GAS HEATING AND RESIDENTIAL AIR CONDITIONING -4 WEEKS 4 CREDITS

This course is designed to provide the student with the necessary information about service and repair of gas fired warm air hating units and residential central air systems. Combustion theory, efficiency testing, combustion air and vent design, heat exchanger types, blower motors, fans and control systems including thermostats are covered.

Students will study installation, operation and maintenance techniques for A/C units found in single-family homes and living facilities. Specific topics of study include mechanical repairs, air treatment, electrical repairs and home duct work. (Offered in the spring and summer)

HV214 OIL FURNACES AND HYDRONIC HEATING- 4 WEEKS 4 CREDITS

This course covers the installation, maintenance, and operation of oil-fired hot air and hydronic heating systems; principles Of combustion, and hands-on troubleshooting in residential and light commercial applications. This course will include oil efficiency testing, oil safety, and a NORA oil certification. Students will also learn the principles of steam, as well as hydronic system design and maintenance. (Offered in the spring and summer)

MA080 FUNDAMENTAL MATHEMATICS 3 CREDITS

This course is designed to reinforce the foundations of mathematics and prepare students for success in future math courses. Topics covered include fractions, mixed numbers, decimals, fraction to decimal conversion, basic rules of algebra, real numbers and operations, order of operations, linear equations. To help students develop number sense and mental arithmetic, the use of calculators will not be allowed in most instances.
(Offered in the fall, spring, and summer)

MA101 MATHEMATICAL EMBEDDED SUPPORT 1 CREDIT

Mathematical Embedded Support is designed to assist students in their math course by providing extra opportunities for learning support. Students will have an opportunity to post questions and meet with their instructor via Canvas weekly for help. Students will also have access to support videos made by the professor.

MA105 TECHNICAL MATHEMATICS I 3 CREDITS

This course is designed as an overview of the math topics most often encountered in a technical environment. Practical examples of the math as it is used in the various technical fields are employed as much as possible. Topics covered include: a review of fractions and decimals, unit conversions, ratios and proportions, percentages, exponents and polynomials, and solving and graphing linear equations. Prerequisite: MA080 (grade of C or higher) or Placement.
(Offered in the fall, spring, and summer)

MA106 TECHNICAL MATHEMATICS II 3 CREDITS

This course, the second in the technical math sequence, continues to develop students' mathematics knowledge through the use of practical examples. Topics covered include ratio and proportion, geometry, and right angle trigonometry. An emphasis is placed on practical examples from the automotive field and project assignments are used to refine problem solving, critical thinking and communication skills. Prerequisite: MA105
(Offered in the spring and summer)

MA107 OPTICAL MATH 3 CREDITS

Optical Math provides the Opticianry student with an opportunity to become familiarized with mathematical concepts and formulae that are commonly used in ophthalmic science. The student will be introduced to optical formulae that contain mathematical concepts involving positive and negative integers, definition of infinity, algebra, trigonometry and approximations. In addition, students will learn how to solve complex optical formulae using a scientific calculator. (Offered in the spring)

MA 115 PLANE AND SOLID GEOMETRY 4 CREDITS

This course introduces the study of Euclidean geometry, focusing on lines and angles, measurement and units, triangle properties, parallelograms, trapezoids, polygons, circles, spheres, conic sections, pyramids, areas and volumes. Applications to the field of building technology will be stressed. Prerequisite: MA105 (Offered in the fall)

MA120 COLLEGE ALGEBRA AND TRIGONOMETRY 3 CREDITS

This course begins with a review of units of measurement and the metric system Students' understanding of algebra is developed through an examination of algebraic expressions, mainly polynomial and rational, and the methods of solving rational equations, systems of linear equations, quadratic equations, other types of equations, and word problems. The introduction to the basics of functions and their graphs leads into the study of composite and inverse functions. The course concludes with an introduction to angles and radian measure, followed by problem solving involving angles and right triangle trigonometry, with an introduction to circle trigonometry. Prerequisite: MA 095 (grade of C or higher) or MA105 (grade of C- or higher) or Placement. (Offered in the fall, spring, and summer)

MA130 PRECALCULUS 3 CREDITS

The ultimate goal of this course Is to help students transition from seeing functions as input-output operators to seeing functions as independent objects that can be operated upon. To that end, the course focuses on developing a library of various families of functions and their graphs. The course begins with polynomial and rational functions, with emphasis on intercepts and end-behavior, then transitions to exponential and logarithmic functions, with emphasis on function transformations, and finally trigonometric functions. The course concludes with an exploration of polar coordinates, the complex plane, and an introduction to vectors. Prerequisite: MA120. (Offered in the fall, spring, and summer)

MA240 CALCULUS I 4 CREDITS

This course introduces the concepts of Calculus: rate of change and accumulation of quantity. Course topics include: a brief review of functions; and introduction to limits; the extension of the concept of slope to rates of change (average and instantaneous); the concept of derivative and the rules for differentiation, applications of derivatives and differentiation; and in introduction to accumulations of quantity, integration, and the Fundamental Theorem of Calculus. Prerequisite: MA130 . (Offered in the fall, spring, and summer)

MA250 CALCULUS II 4 CREDITS

This course builds and expands upon the techniques and applications covered in Calculus I, beginning with a review of basic integration: the accumulation of area and the Fundamental Theorem of Calculus. New topics include: advanced integration techniques such as integration by substitution and integration by parts; applications of integrals such as areas between curves, volumes of rotation and solving elementary differential equations; and an examination of the calculus of parametric equations and functions. Prerequisite: MA 240. (Offered in the fall, spring, and summer)

MA260 CALCULUS III 4 CREDITS

Topics include: parametric equations and polar coordinates (curves, areas, conic sections); vectors and the geometry of space (the dot product, vector arithmetic, lines and planes in 3-space, the cross product, cylinders and quadratic surfaces); vector functions (limits, derivatives and integrals, motion in space); partial derivatives (functions of several variables, limits and continuity, tangent planes and differentials, chain rule, directional derivatives, gradient, extrema, Lagrange multipliers); multiple integrals (double integrals, applications); vector calculus (vector fields, line integrals, fundamental theorem for line integrals, Green's Theorem, curl and divergence, parametric surfaces, surface integrals). 4 lecture hours plus 1 recitation session each week. Prerequisites: MA250 with grade of C or better. (Offered in the fall)

MA265 FINITE MATH 3 CREDITS

This course serves as a broad overview of topics in finite math and a brief introduction to topics in statistics. Topics covered include linear equations, linear systems, linear programming, mathematics of finance, matrix math, probability, and an introduction to statistics. (Offered in the fall)

MA270 STATISTICS 3 CREDITS

This course studies the collection, analysis and presentation of data, frequency distributions, probability and probability distributions. Making inferences from statistical data and the techniques used for making business and management decisions will be discussed. Applications to various technical fields will also be included. Data analysis and presentation make use of statistical software. Prerequisite: MA 120 or MA265.
(Offered in the fall, spring and summer)

MA290 TOPICS IN HEALTHCARE STATISTICS 1 CREDIT

This course is an MA270 laboratory component that focuses on the healthcare sector. As such, it provides an introduction to the use of statistics in the fields of healthcare. Topics include conducting statistical analyses using the Statistical Analysis Systems (SAS) software on various publicly available health IT and healthcare datasets, employing contemporary charts such as bubble and motion to visualize data, calculating descriptive and inferential statics, and performing quality assessment and improvement (such as process, collection tools, data analysis, reporting techniques), as well as creating PivotChart and PivotTable Report. Co-requisite: MA270 (Offered in the fall)

ME105 CAD WITH SOLIDWORKS 3 CREDITS

As an introductory course to CAD (Computer Aided Design) with SolidWorks, this course begins with creating properly dimensioned 2-D sketches and over the semester progresses towards creating fully dimensioned 3-D parts and assemblies. The students complete a series of projects that practice their ability to read sheet drawings, visualize the dimensioned object in 3 Dimensions, create a 3-D model and create a completely dimensioned sheet-drawing from the 3-D model. In addition, basics of Assembly creation within SolidWorks is also introduced.
(Offered in the fall and spring)

ME106 ADVANCED CAD WITH SOLIDWORKS 3 CREDITS

As continuation of the prerequisite course "ME105 Introduction to CAD using SolidWorks". This course covers intermediate tools in SolidWorks which make it possible to create complex parts and assemblies. In addition, a large emphasis is placed on clear articulation of "design intent" and creation of "professional quality" SolidWorks models. In terms of SolidWorks concepts, the course covers creating complex curves and surfaces, and using configurations, equations, loft features, sweep features and multi-body tools. Prerequisites: ME105 (Offered in the spring and summer)

ME115 SOLAR ENERGY AND PHOTOVOLTAICS 3 CREDITS

An introduction to the basic principles of Photovoltaics. Topics will focus on site selection, panel types, storage centers, system design, and system application. The course covers the fundamentals of energy harvesting based on photovoltaic systems and internal components. Students will use simulation software to study site analysis, system sizing, array configuration, and performance estimation. The foundational aspects of energy generation using solar panels, cost analysis, environmental effects, and performance characteristics will be covered. Prerequisites: EE105
(Offered in spring)

ME130 INTRODUCTION TO ALTERNATIVE ENERGY SYSTEMS 3 CREDITS

The course serves as the introduction to a wide variety of energy resources, power generation techniques and energy needs. Power generation methods based on solar, wind, geothermal and hydro sources are discussed. The concepts of grid integration and energy management are introduced. (Offered in fall)

ME150 INTRODUCTION TO MANUFACTURING 4 CREDITS

Introduction to the basic processes related to machining and cutting engineering materials. Methods of joining both mechanical and welding, brazing, and soldering. The use of measuring instruments for the production of accurate parts. (Offered in the spring and summer)

ME151 MANUFACTURING PROCESSES AND CNC MACHINING 4 CREDITS

The study of advanced manufacturing processes such as forging, casting, forming processes, injection molding, thermo forming and composite layups. Programming and operation of CNC equipment including an introduction to Robotics. Prerequisites: ME105, ME150 (Offered in the fall)

ME201 WORKING IN THE BATTERY INDUSTRY 3 CREDITS

The course will lead students on an end-to-end journey from an overview of working in a battery laboratory, to building coin and pouch cells – the fundamental test vehicles of any battery lab. Each class period will have a lab component and supplemented with targeted lectures on battery operating principles. Analytical techniques will be used to characterize the batteries on a materials level as well as analyze cycling performance and best practices of reporting data. An e-bike battery will be disassembled to study the construction of a pack. The course will include a field trip to a battery pilot line in the Boston area. Another major focus will be on career development to help students prepare to enter the energy technology workforce through resume building and networking events. The course will culminate with a capstone project where students will be given battery material powders and will work through the entire process of turning them into batteries and characterizing the material performance. Students will then present the findings on the during the final class period to a group of Boston-area battery professionals (Offered in the spring).

ME205 SOLAR ENERGY AND PHOTOVOLTAICS 4 CREDITS

The course is designed to give the students an insight into the fundamentals of solar energy-based energy harvesting techniques. Structural, component-level and installation features of various types of solar cells and panels are discussed. The concepts of energy storage, energy efficiency strategies, costs and energy analysis are covered in detail. The laboratory part of the course includes hands on activities based on building small-scale solar energy harvesting system. Prerequisites: ME130. (Offered in spring)

ME210 SUSTAINABILITY AND ENERGY EFFICIENCY 3 CREDITS

The course will give the participants an overview of the topics focused on energy management, energy consumption and energy monitoring. Students will study the impacts of energy efficiency techniques on commercial and residential environments. Additionally, energy monitoring, measuring and calculation of energy savings will be discussed. (Offered in fall)

ME215 WIND TURBINE TECHNOLOGY 4 CREDITS

The course includes a comprehensive study and analysis of basic types of wind turbines, turbine components/ operation, electricity, and electric generation. The participants will learn about the grid integration concepts, electrical systems, mechanical controls and safety issues of the wind turbine systems. Additionally, the cost benefit analysis, economics of wind energy and environmental effects of wind-based energy systems will be discussed. The laboratory component of this courses covers the operational, power monitoring, power measurement and data analysis aspects of the wind turbine systems. Prerequisites: EE105, EE101. (Offered in spring)

ME220 MASTERCAM MILLING I 4 CREDITS

The students will receive the basics of two-dimensional part programming including: geometry development, milling, drilling, tapping, and pocketing. Prerequisites: ME106, ME151 (Offered in the fall)

ME225 MASTERCAM MILLING II 4 CREDITS

This course is a continuation of topics student in ME220. Students will work with 3D model building, tool path selection, creation and verification. This course serves as a solid foundation for Computer Numerical Control (CNC) programmers to develop sound modeling skills within the MASTERCAM CAD environment and is an essential toolset for a MASTERCAM programmer. Prerequisites: ME106, ME151, ME220 (Offered in the fall)

ME232 GENERAL INDUSTRY SAFETY TRAINING 3 CREDITS

To maintain a healthy and safe work environment, OSHA recommends employees in various industries participate in workplace general industry safety training. The course is designed to familiarize workers with OSHA standards as well as safety and health hazards common to the workplace. The course is designed to be fully narrated and interactive with a goal to educate workers on identifying, avoiding, controlling, and preventing jobsite hazards. The course is appropriate for workers in the following fields: factory operations, warehousing, manufacturing, storage and more and will educate workers to predict, prevent, identify, and stop possible common worksite hazards.

ME235 MODELING RENEWABLE ENERGY 3 CREDITS

This course introduces software tools to perform designing, simulation and analysis of green buildings and renewable energy based small scale power generation stations. The participants will study and evaluate energy performance, design optimization and data collection techniques. Prerequisites: ME130, ME210, ME205. (Offered in spring)

ME240 MACHINE DESIGN WITH SOLIDWORKS 4 CREDITS

This course covers the process of designing mechanical machines using SolidWorks. In this course, several example mechanical tools and machines are disassembled, analyzed, discussed and re-assembled as a part of the course. These case studies are followed by a series of projects – where the students design the parts and assemblies of machine/tool in study. Strong emphasis is given to understanding functional requirements for the parts and features that go into the designs. As the next step to the prerequisite courses: Introduction to CAD using SolidWorks (ME105) and Advanced CAD (ME106), this course covers additional SolidWorks modules for designing Sheet Metal parts, designing Molds for molded parts, running Simulations, creating advanced Assemblies and creating standard parts using the ToolBox. Prerequisites: ME106, MA120 (Offered in the fall)

ME250 ADVANCED MANUFACTURING AND CNC 4 CREDITS

Rapid prototyping is covered from concept to completed part. The use of SolidWorks models to generate CNC programs and parts. Prerequisites: ME106, ME151 (Offered in the spring)

ME252 THERMODYNAMICS 4 CREDITS

This course will focus on the following: First and Second Law of Thermodynamics; thermodynamic properties of substances; reversible and irreversible processes, entropy; thermodynamic processes, power and refrigeration cycles; three modes of heat transfer, conduction, convection and radiation; heat transfer through plain surfaces and fins, in tube flow and in heat exchangers. Prerequisites: MA120, PH212. Co-requisite: ME110 (Offered in the fall)

ME330 INDUSTRY EXPERIENCE/PROJECT 3 CREDITS

A project-based course in which students will develop real project schedule, progress reports, presentations, and team meeting agendas. (Offered in spring)

ME350 RAPID MANUFACTURING AND PROTOTYPING PROCESSES 4 CREDITS

This course provides a high-level, hands-on introduction to rapid manufacturing and prototyping processes. The students design and build parts using 3D printing, Laser cutting, CNC Plasma Cutting and CNC Water-Jet Cutting. The course will cover the capabilities and limitations inherent to each of these processes, the materials that are suitable to use with each process and the geometric limitations on the parts that can be produced with process. Furthermore, the course will cover how to modify part design to minimize the impact of process limitations.

OP105 ANATOMY AND PHYSIOLOGY OF THE EYE 3 CREDITS

In this course students will learn the anatomical structure of the eye and its adnexa. The student will also study the function of the eye related to vision, eyewear, and contact lenses. Common ocular disorders and related symptoms that affect vision will also be discussed in great detail.

OP110 OPHTHALMIC OPTICS I 3 CREDITS

In this course students will learn the science of light as it travels through space and air, into an ophthalmic prescription lens, and finally, into the eye in order to enhance the wearer's visual experience of their environment. Students will also learn the different ophthalmic lens materials, how to analyze a written prescription and design the most appropriate spectacle correction, and common ocular disorders and their affect on vision.

OP115 PRINCIPLES AND PRACTICES IN OPTICIANRY I 3 CREDITS

In this introductory course students will review fundamental aspects of the principles and practices of opticianry related to patient care, customer service, and the manufacturing of prescription glasses. Students will also learn basic use and applications of the tools, adjusting pliers, finishing machinery, measuring and fitting devices, record keeping systems, and ordering procedures as they are related to optical lab, and latest technology in operation of the optical shop.

OP120 OPHTHALMIC OPTICS II 3 CREDITS

This course is designed to include a continued discussion of Ophthalmic Optics topics related to prescription analysis and prisms using problem solving and case study analysis. Specific advanced prism topics include combining prisms, vertical imbalance, image jump, and slab-off prisms. Additional topics include vertex distance compensation, calculating the power in any meridian, and prism thinning for a progressive addition lens design.

A comprehensive review of topics from Ophthalmic Optics 1 and 2 will be presented toward the end of the course. (Offered in the spring and summer)

OP122 OPHTHALMIC DESIGN & DISPENSING THEORY I 3 CREDITS

OP123 OPHTHALMIC DESIGN & DISPENSING THEORY I LAB 1 CREDIT

This course is a hybrid course in which a portion of the course (approximately 75%) is offered as distance learning, and another portion meets physically on campus (approximately 25%). Ideally, students will engage in weekly distance learning sessions and assignments, a weekly on-campus lab for a practical quiz and/or assignment, and a monthly regular on-campus lecture session.

This course is designed to introduce the student to the dispensing procedures. This course is designed to instruct the student in the process for ordering an Rx from the lab, the insertion and removal of lenses from frames and mountings, the alignment and adjustment of the frames and mountings for standard alignment and for the client's face. The lab portion of the course is designed to introduce the student to the practical dispensing of optical products. Practical topics covered in the course include the neutralization of single vision and multifocal lenses for duplication of an Rx, measurement of frames and mountings, measurements of pupillary distance (PD's), and the demonstration and calculation of the placement of multifocal segments. (Offered in the fall)

OP125 PRINCIPLES AND PRACTICES IN OPTICIANRY II 3 CREDITS

This course will consist of lectures, demonstrations, and practice time to develop skills in the fabrication of single vision eyewear. It will include surfacing procedures, the use of the lensmeter for verification and the layout of single vision lenses for edging. Blocking, automatic edging, hand beveling, lens tempering, lens insertion, pattern making, and machinery maintenance will also be covered. The clinical portion of this course will offer students an opportunity to gain real life exposure to the designing, fitting and dispensing of prescription eyewear in an optical business setting. The students will learn to operate an optical business, as well as the intricacy of quality patient care.

The Optical Shoppe is open during the regular academic year and is operated by the students under the direct supervision of licensed opticians. The operating clinic offers students the opportunity to learn the practical aspects of opticianry through weekly presentations and assignments, as well as actual patient care.
(Offered in the spring and summer)

OP128 OPTICAL BUSINESS & CLINICAL CARE MANAGEMENT 2 CREDITS

This business course, specific to managing an optical dispensary, will cover point-of-purchase and business software programs, handling insurance programs pertinent to the optical consumer, and professional and ethical business conduct. Additionally, customer care practices related to low vision dispensing, pediatric care, sports protection and eye health, and treatment of computer vision syndrome, will be presented by experts in each area of specialization. (Offered in the spring)

OP230 CONTACT LENS THEORY I 3 CREDITS

OP231 CONTACT LENS THEORY I LAB 2 CREDITS

This course is designed as a basic introduction to the fitting of rigid and soft contact lenses. It will include terminology, instrumentation for the fitting of contact lenses, the development and history of lenses, patient selection, and the assessment of the fit.

The lab portion of the course is designed to introduce the student to the handling of contact lens materials and the operation and maintenance of instruments used in the fitting and designing of contact lenses. Primary instruments that students will be operating include a keratometer, measuring loupes, lensmeter, phoptor, biomicroscope, radiuscope, and corneal topographer. (Offered in the fall)

OP232 OPHTHALMIC DESIGN & DISPENSING II 3 CREDITS

OP233 OPHTHALMIC DESIGN & DISPENSING II LAB 1 CREDIT

This course is a hybrid course in which a portion of the course (approximately 75%) is offered as distance learning, and another portion meets physically on campus (approximately 25%). Ideally, students will engage in weekly distance learning sessions and assignments, a weekly on-campus lab for a practical quiz and/or assignment, and a monthly regular on-campus lecture session.

The course is designed to further explore topics learned in Ophthalmic Design & Dispensing I and Ophthalmic Design & Dispensing Lab I. Students will review frame alignment and adjustments, techniques for fitting multifocals, and lens identification. The course will expand into troubleshooting of visual problems, repairing of frames, applying safety standards in the optical workplace and lifestyle dispensing. Students will become familiar with progressive lenses, lens options / coatings, and the techniques for ordering lenses, frames and optical supplies. The lab portion of the course is designed to further explore topics learned in Ophthalmic Design & Dispensing I and Ophthalmic Design & Dispensing II. Students will review frame alignment and adjustments, techniques for fitting multifocals, and lens identification. The course will expand into troubleshooting of visual problems, repairing of frames, applying safety standards in the optical workplace and lifestyle dispensing. Students will become familiar with progressive lenses, lens options/coatings, and the techniques for ordering lenses, frames and optical supplies. (Offered in the spring)

OP235 PRINCIPLES AND PRACTICES IN OPTICIANRY III 3 CREDITS

In this progression course, students will be able to hone and perfect the lab finishing skills in the fabrication of prescription eye wear. Students will learn the advances in spectacle finishing and manufacturing, and complete lab assignments which contain multiple jobs of varying levels of difficulty.

The clinical portion of this course will offer students an opportunity to gain real life exposure to the designing, fitting and dispensing of prescription eyewear in an optical business setting. The students will learn to operate an optical business, as well as the intricacy of quality patient care.

The Optical Shoppe is open during the regular academic year and is operated by the students under the direct supervision of licensed opticians. The operating clinic offers students the opportunity to learn the practical aspects of opticianry through weekly presentations and assignments, as well as actual patient care. (Offered in the fall)

OP240 CONTACT LENS THEORY II 3 CREDITS

OP241 CONTACT LENS THEORY II LAB 2 CREDITS

This course is a continuation of Contact Lens Theory I, emphasizing contact lens verification, dispensing, and follow-up care. The fitting of astigmatic, presbyopic, and special needs patients will also be covered. The lab portion of the course is a continuation of Contact Lens Lab I emphasizing contact lens verification, dispensing, and follow-up care. The fitting of astigmatic, presbyopic, and special needs patients will also be covered. The lab portion of the course is designed to introduce advanced levels of clinical instrumentation and their use in determining the proper contact lens fit on the eye.

Students will also be able to refine and hone their expertise in the handling of contact lens materials and the operation and maintenance of instruments used in the fitting and designing of contact lenses. Primary instruments that students will be operating include a keratometer, measuring loupes, lensmeter, phoptor, biomicroscope, radiuscope, and corneal topographer (Offered in the spring)

OP243 PRINCIPLES AND PRACTICES IN OPTICIANRY IV 3 CREDITS

This course is designed to educate students in the technical skills of performing various procedures within the ophthalmic visual assessment area of a dispensary. The course will present technical equipment procedures, maintenance and use, as well as the skills needed in assisting Optometrists and patients with various procedures such as administering medicines and pharmacology identification and uses. The clinical portion of this course will offer students an opportunity to gain real life exposure to the designing, fitting and dispensing of prescription eyewear in an optical business setting. The students will learn to operate an optical business, as well as the intricacy of quality patient care.

The Optical Shoppe is open during the regular academic year and is operated by the students under the direct supervision of licensed opticians. The operating clinic offers students the opportunity to learn the practical aspects of opticianry through weekly presentations and assignments, as well as actual patient care. (Offered in the spring)

OP245 VISION ASSESSMENT 3 CREDITS

This course is designed to instruct the student in the theories behind the various tests given during a routine refraction. Topics include anatomy and physiology of the eye (review), mechanics of ametropias, epidemiology and etiology of refractive errors. Trends in visual acuity and accommodative / convergence relationships in the myopic, hyperopic and presbyopic eye will be discussed. Also included will be problems in binocular vision and retinoscopy.
(Offered in the spring)

OP 281 OPTICIANRY TECHNICAL SKILLS AND SERVICE LAB 1 1 CREDIT

In this course students will have an opportunity to refine their technical opticianry skills through providing community service to the vision needy population within the Franklin Cummings Tech college comunity, city of Boston, and neighboring towns. Students will also engage in creating sustainable programs focusing upon recycling prescription spectacles for re-distribution to vision veedy populations around the world. (Offered in the fall)

OP 282 OPTICIANRY TECHNICAL SKILLS AND SERVICE LAB 2 1 CREDIT

TIn this course students will continue to provide vision care and free prescription spectacles to vision needy citizens in the college and city community. Students will engage in coordinating supporting a procedural system for preparing recycled prescription spectacles for global distribution by mission organizations.

Additionally, students will practice and evaluate their technical performance using virtual simulations of opticianry procedures and measurements in preparation for practical certification exams.

PE101 ELECTRICAL CODE I 5 CREDITS

A study of the requirements of the National and Massachusetts Electrical Codes. The focus of study is on Chapters 1-4 of these codes. Topics include an introduction to the codes, general rules and requirements for electrical installations, wiring and protection, general wiring methods and materials, and equipment for general use in electrical installations. Included in the course is a hands-on practical application of the principles learned in lecture. During the lab experience students will be instructed in the design and configuration of common switching circuits, control circuits, and installation of electrical services while utilizing wiring methods common to residential installations. Training in the use of electrical tools, along with the testing and troubleshooting of basic electrical circuits are included. (Offered in the fall and spring — evenings)

PE103 ELECTRICAL CIRCUIT THEORY 5 CREDITS

A study of the concepts of voltage, current, resistance, and electrical power as applied to common DC and sinusoidal AC circuits. Topics covered are Ohm's Law, series, parallel, and combination circuits. Other topics include magnetism, AC waveforms, inductance, capacitance, reactance, and impedance, along with phasers and RC, RL and RLC circuits. Included with this course is a laboratory component that provides the student an opportunity to visually analyze the practicable application of those principles discussed in lecture. Students will assemble Direct and Alternating Current series, parallel and combination circuits comprised of resistive, inductive and capacitive loading components. The assigned lab experiments will provide the student an opportunity to clarify the various fundaments of power distribution and the relationship of voltage, current, power, power factor and phase relationships commonly experienced in today's electrical systems. (Offered in the fall and spring — evenings)

PE201 ELECTRICAL CODE II 5 CREDITS

A continuation of study of the National and Massachusetts Electrical Codes and the study of the fundamentals of electrical design, based on the requirements of these codes. Topics focus on Residential and Commercial applications and include Grounding and Bonding, overcurrent protection devices, services, single- and multifamily dwelling calculations, raceway and box calculations, conductor sizing and voltage drop calculations, and commercial calculations. The course includes a hands-on laboratory component where topics discussed in lecture will be explored; particular attention is paid to safety rules for working on electrical systems. Prerequisite PE101 (Offered in the spring and summer — evenings)

PE203 ELECTRIC MACHINES 5 CREDITS

Advance coverage on AC circuits and power factor. A study of the theory of polyphase circuits, single and three phase transformers, rotating electrical machinery, machine characteristics, and practical control of machines. Included with this course is a laboratory component that provides an opportunity for students to visually analyze the application of those principles discussed in lecture. Students will connect and operate direct current motors and generators, alternating current transformers, motors and generators, and monitor their operation under simulated load. The lab experiments will provide the student an opportunity to observe the various fundaments of power distribution and the effects of various reactive loads on the operation of transformers, generators, AC motors and motor control circuits. Prerequisite PE103 (Offered in the fall and spring — evenings)

PE211 ELECTRICAL CODE III 5 CREDITS

A continuation of study of the National and Massachusetts Electrical Codes with emphasis on advanced topics. The focus of study is on Chapters 5-7 of these codes. Topics include the requirements for electrical installations in special occupancies such as hazardous locations, the installation requirements of special equipment such as swimming pools, and the requirements associated with special conditions such as emergency systems. Included in this course is a laboratory component that provides a practical application of the requirements of the National and Massachusetts Electrical Codes as applied to the topics discussed in lecture. Prerequisite PE201
(Offered in the fall and summer — evenings)

PE213 ELECTRICAL SYSTEMS & REGULATIONS 3 CREDITS

This course is an advanced study of electrical systems and system control circuitry. Emphasis will be on the design, operating principles, and characteristics involved in the installation, layout, protection, and control of alternating and direct current motors, generators, control circuits, transformers, and air conditioning. The student will explore schematic and ladder diagrams, and the operation, and connections. Laboratory exercises will support and enhance the student understanding of these principals. Other topics to be covered include Fire Warning and Security Systems, Power-Limited Sources and Circuits, and Data and Communications Wiring. Study will include basic theory, operation and selection of equipment, cables, and wiring methods necessary for installation, and termination of low voltage systems. Also covered will be an overview of MGL. 141.1-9, 143-3L and 237 CMR 12.00 thru 23.00 pertaining to licensing requirements. Prerequisite PE203 (Offered in the and fall and summer — evenings)

PH102 PHYSICS 3 CREDITS

This course is an introduction to the physics of mechanics and basic concepts in chemistry, including the study of motion, Newton's Laws, energy, conservation laws, physics of matter, temperature, heat transfer, the atom, the periodic table, chemical bonding, the Mole, and balancing chemical equations. (Offered in the spring and summer)

PH212 PHYSICS I 4 CREDITS

This course is an algebra-based introduction to the physics of mechanics that includes a math review (algebra, geometry and trigonometry), scalars and vectors, force, mass, equilibrium, torque, acceleration, gravity, Newton's Laws, work, energy, power, impulse, momentum, circular motion and rotation of rigid bodies. The lab part of the course offers the opportunity to practice laboratory techniques, data collection, and written reports. Prerequisite: MA115 or MA120. Co-requisite: PH215 (Offered in the fall and spring)

PH213 PHYSICS II 4 CREDITS

This course is an algebra-based approach to the physics of mechanics, thermodynamics, waves, sound, electricity and optics. Topics include: SHM, Doppler Effect, sound waves, Snell's Law, Lens Law, thermal expansion, Pressure Law, First Law of Thermodynamics, heat transfer, Ohm's Law, Kirchoff's Rules, DC/AC circuits and magnetism. The lab part of the course focuses on supporting the topics in the physics lectures for PH213 and PH223. This lab offers the opportunity to practice laboratory techniques, data collection, and written reports. Topics include: mechanics, thermodynamics, harmonic motion, electric charge, and optics. Pre-requisite: PH212. Co-requisite: PH225. (Offered in the spring.)

PH222 UNIVERSITY PHYSICS I 4 CREDITS

This course is a calculus-based approach to the physics of mechanics. The topics include scalars, vectors, and up to vector calculus; the kinematics of translation; force, mass and dynamics of translation; statics, equilibrium, and torque; angular quantities and dynamics of rotation; friction, work, energy and power; impulse and momentum; simple harmonic motion and oscillations; Universal Law of Gravitation; the mechanics of solids and fluids; wave motion and wave equations; sound including Doppler Effect; superposition principle. Co-requisite: PH215 (Offered in the fall)

PH223 UNIVERSITY PHYSICS II 4 CREDITS

This course is a calculus-based approach to the physics of thermodynamics, waves, electricity and magnetism. The topics include the study of fluids and fluid dynamics, harmonic motion and wave phenomenon, thermodynamics and heat, and electricity and magnetism. Prerequisite: PH222, Co-requisite: PH225 (Offered in the spring)

PS110 THE HISTORY OF PUBLIC HEALTH 3 CREDITS

From the first introduction of government-mandated quarantines to the modern movement towards universal health care, the role of public health and governance has fundamentally shaped human societies. In this course, students will learn the role of the state in ensuring favorable public health outcomes. Students will also learn the importance of public health, understand how it is provided, and learn how it is practiced. This course is intended to introduce students to the field of public health; it is intended to be broadly accessible to all students and provide a practical understanding of the field. (Offered in the fall)

PS320 EPIDEMIOLOGY 3 CREDITS

Epidemiology is the branch of medicine which deals with the incidence, distribution, and control of a disease. In this course, students will learn and apply key concepts of epidemiology to multiple domains of public health. Students will learn how to use epidemiology to better understand, characterize, and promote health at a population level. (Offered in the spring)

PS401 PUBLIC HEALTH STUDIES I 3 CREDITS

This course is intended to provide students with a means of evaluating the health impact of political decisions and a broad knowledge base about the practice of Public Health today. Students will explore a range of current topics in public health - including COVID-19, HIV/AIDS, and the obesity epidemic. Students will also look at the impact of US politics on global public health, especially in developing nations. Furthermore, this course will explore key topics such as the WHO's Millennium Development Goals, the disastrous circumstances that can arise when Public Health Policies fail, and the conflict between data and political will that drives so much of Public Health policy decision making. This course culminates in a project in which students must plan a Health Impact Assessment of a current or proposed federal or state policy. Prerequisite: PS110 (Offered in the fall)

PS405 PUBLIC HEALTH STUDIES II 3 CREDITS

This course provides students with a variety of tools for understanding the impact that disease or other Public Health concerns may have on a population. Students will learn how to design effective surveys, analyze geographic data, and use qualitative information with the ultimate goal of gaining a better understanding of how events may affect the health of a particular population. This course will also require students to participate in a mapathon in order to help them build understanding of how geographic data is used in the practice of Public Health. Prerequisite: PS110 and PS401 (Offered in the spring)

PS410 BIOSTATISTICS FUNDAMENTALS WITH PYTHON PROGRAMMING 3 CREDITS

This course covers the fundamentals of biostatistics, and teaches students how to conduct, present, and interpret biostatistical analyses using Python. Topics include descriptive statistics, probability, probability distributions, methods of estimation and hypothesis testing, nonparametric methods, analysis of categorical data, regression and correlation methods, technique for epidemiologic studies, control of confounding, error types, significance, confidence levels, estimation of sample size and power. For labs, Python will be used to analyze public health-related data. Pre-requisites: PS110, MA270, MA290, and DA105 (Offered in the spring)

SK100 ACADEMIC ACHIEVEMENT SEMINAR 0 CREDIT

The Academic Achievement Seminar is designed to support and enhance academic endeavors as students reenter courses at Benjamin Franklin Cummings Institute of Technology. This course will teach students how to claim their education. Students will learn how to utilize campus resources, academic success strategies, and lifelong learning techniques that will prepare them to achieve success in their present and future academic career. The elements of professionalism: time management, accountability, teamwork, workplace ethics, and active participation in learning, will be strongly emphasized and put into practice. This course will also provide individualized tutoring support to reestablish strong study habits. (Offered fall and spring)

SK101 INTRODUCTION TO TECHNICAL AND PROFESSIONAL SKILLS 3 CREDITS

This course provides students with an introduction to the core competencies valued in most workplace and/or higher education settings: basic computer literacy and strong professional communication skills. As so much of today's professional communication takes place via technology platforms, students receive training in the following basic computer applications: Zoom, Microsoft Word, and, of course, Microsoft PowerPoint and Excel. Students also receive training in professional communication processes to build strong workplace communication skills. Students learn to recognize both effective and ineffective verbal communication patterns, as well as how to present written, oral, and visual information. Information literacy plays a significant role in this course, as many learning activities ask students to integrate outside research into their own work. Teaching technical and professional communication skills in the same course employs a holistic approach to prepare students for the contemporary workplace and further education.

SK110 SUCCESS IN AUTOMOTIVE TECHNOLOGY 0 CREDIT

Success in Automotive is designed to assist students in the transition from the Department of Academic Development into their major classes and to provide additional lifelong learning skills to support success towards earning an Associate Degree. Students meet with academic coaches each week in focus groups and review sessions with their peers. Students meet to review material specific to their automotive courses and to discuss academic challenges, as well as challenges that occur outside of school that hinder their success. Academic coaches also provide support to students' academic success through one on one meetings. (Offered in the fall and spring)

SK115 SUCCESS IN CONSTRUCTION MANAGEMENT 0 CREDIT

Success seminars serve students in a number of ways: they connect students with college resources, such as financial aid, the library, counseling services, and student life/campus activities; they help students balance their outside and academic lives by working through topics like time and stress management, academic honesty, multicultural perspectives, and ethics; and, of course, they provide students with significant support in the Construction Management program by reviewing coursework and targeting specific areas in which students may need extra help, as well as outlining the professional realities of working in the industry.

SK120/125 SUCCESS IN CT/HIT 0 CREDIT

Success seminars serve students in a number of ways: they connect students with college resources, such as financial aid, the library, counseling services, and student life/campus activities; they help students balance their outside and academic lives by working through topics like time and stress management, academic honesty, multicultural perspectives, and ethics; and, of course, they provide students with significant support in the Computer Technology and Health Information Technology programs by reviewing coursework and targeting specific areas in which students may need extra help, as well as outlining the professional realities of working in the industry. For students who have yet to declare a concentration, this seminar will help in this process by clearly explaining the options, such Certificates (Network and Systems Support, Software Development, Web Design); Associate Degrees (Computer Technology and Health Information Technology); and Bachelor Degree (Health Information Technology - General Track) with two tracks within it, Public Health and Data Analytics.

SK130 SUCCESS IN ELECTRICAL TECHNOLOGY SEMINAR 0 CREDIT

The Success in Electrical Technology Seminar is designed to support the student's entry into the Electrical Technology program. Successful completion of this seminar is based on attendance, preparation, and participation. Success is also based on the successful completion of EL110 and EL127 with a GPA of 2.00. This seminar must be retaken if the student has not fulfilled the requirements of either course. (Offered fall and spring)

SK135 SUCCESS IN ELECTRONICS 0 CREDIT

Success seminars serve students in a number of ways: they connect students with college resources, such as financial aid, the library, counseling services, and student life/campus activities; they help students balance their outside and academic lives by working through topics like time and stress management, academic honesty, multicultural perspectives, and ethics; and, of course, they provide students with significant support in the Electronics program by reviewing coursework and targeting specific areas in which students may need extra help, as well as outlining the professional realities of working in the industry. Students will also learn more about degree tracks and career opportunities, such as Robotics and Automation and Biomedical Electronics.

SK140 SUCCESS IN MECHANICAL ENGINEERING TECHNOLOGY 0 CREDIT

Success seminars serve students in a number of ways: they connect students with college resources, such as financial aid, the library, counseling services, and student life/campus activities; they help students balance their outside and academic lives by working through topics like time and stress management, academic honesty, multicultural perspectives, and ethics; and, of course, they provide students with significant support in the Mechanical Engineering Technical program by reviewing coursework and targeting specific areas in which students may need extra help, as well as outlining the professional realities of working in the industry.

SK150 SUCCESS IN TECHNOLOGY BUSINESS MANAGEMENT 0 CREDIT

Success seminars serve students in a number of ways: they connect students with college resources, such as financial aid, the library, counseling services, and student life/campus activities; they help students balance their outside and academic lives by working through topics like time and stress management, academic honesty, multicultural perspectives, and ethics; and, of course, they provide students with significant support in the Technology Business Management program by reviewing coursework and targeting specific areas in which students may need extra help, as well as outlining the professional realities of working in the industry.

SK155 SUCCESS IN HVAC 0 CREDIT

Success seminars serve students in a number of ways: they connect students with college resources, such as financial aid, the library, counseling services, and student life/campus activities; they help students balance their outside and academic lives by working through topics like time and stress management, academic honesty, multicultural perspectives, and ethics; and, of course, they provide students with significant support in the HVAC program by reviewing coursework and targeting specific areas in which students may need extra help, as well as outlining the professional realities of working in the industry. This seminar also features in-depth discussions about the professional expectations and issues facing workers in the field of HVAC, such as safety protocols and industry ethics.

SK200/SK400 CAREER SUCCESS SEMINAR: NEXT STEPS AND BEYOND 0 CREDIT

The Career Success Seminar is designed to support your transition out of Franklin Cummings Tech and prepare you for life after graduation. This seminar will provide you with guidance on how to conduct a successful job search and will assist you in learning how to navigate a professional environment while refining the skills needed to be a successful college graduate. The seminar will provide guest speakers, group activities, and individual guidance on personal goals. You can expect to review topics such as resume writing, job search techniques, interviewing skills, and post graduation finances. (Offered fall and spring)

SS101 AMERICAN POLITICS 3 CREDITS

This course explores the fundamental principles of American government and politics. Students apply foundational concepts to current political topics in an environment where all voices will be heard and respected. Topics include political ideologies, the formation of the American government system, the Constitution, the role of political parties in the United States, politics in the age of information and social media, and the study of current political thought and behavior.

SS105 TWENTIETH CENTURY HISTORY 3 CREDITS

A concentration on major world events including significant social, economic and political shifts and changes viewed through various media including film, fiction, historical articles and non-fiction essays. Through discussions, written responses, presentations and creative projects, students will not only engage in historical studies, but will also use analytical and critical thinking skills to consider the ethical implications of historical events and to determine how accurately history is recorded, taught and represented in education, art, politics, the media and society.

SS115 INTRODUCTION TO PSYCHOLOGY 3 CREDITS

A basic course introducing the major content areas of psychology as a scientific study of human behavior and mental processes through an acquaintance with the fundamental process of human behavior. Topics include: the nature of psychology, biological processes, human development, individual differences, personality and mental health.

SS135 INTRODUCTION TO ANTHROPOLOGY 3 CREDITS

An introductory course that studies human cultures across time and place in their various environmental and historical contexts. The majority of the course focuses on cultural anthropology, and the evolution and development of human societies. Some topics explored might be community, kinship, religion, economic structure, and political order. In addition, the ways in which culture shapes experience is discussed, and students will be called to recognize their role as both creators and byproducts of culture.

SS205 CONTEMPORARY SOCIAL ISSUES 3 CREDITS

This course analyzes, in both empirical and theoretical terms, many of the social problems currently facing Americans. Among these are deepening inequality and poverty among working and middle-class Americans, particularly racial minorities, women, and youth; related problems of racism and sexism; growing unemployment; deterioration of the health system; crime; and war and militarism. Strategies and political options for solving these problems are considered. Through additional coursework, students enrolled in the baccalaureate level course sections learn to practice enhanced critical thinking, especially through analyzing arguments, and to produce research-driven writing and projects to help understand the importance of awareness in addressing social issues.

SS215 WE THE PEOPLE: A CLASS ON COMMONALITIES AND DIFFERENCE 3 CREDITS

This course will provide an analysis of society based on the interrelationships between race, class and gender (including LGBTQ++) and their influence on our social structure and behavior. There will be special focus on the ways in which any type of minority status impacts the social experience and the definition of personal and cultural roles. Both historical and contemporary perspectives will be explored through selected articles and multimedia. Prepared and thoughtful discussions will be integral to the student's experience.

SS216 OPENING THE WINDOWS: EMOTIONAL INTELLIGENCE AND THE SELF IN THE WORLD 3 CREDITS

This is a course about emotions: yours and others'. To guide your discovery, we will read, watch, write, listen, and work together, as we investigate the ways in which our feelings shape our being in the world. We will explore compassion, experience, and agency while we build relationships and create avenues for self-expression and collaboration.

Our primary goal in this class is to build confidence in your ability to be true to yourself while being effective with others. As you build trust and develop relationships with your classmates, you embark together on the design and production of collaborative projects that involve shared creativity, decision-making, and the often inevitable emergence of dissension. Together you will practice strategies for facilitating complex relationships and resolving conflict, such as expressing needs, identifying shared values, and seeking common ground.

SS220 MONSTRUOS, DEMONIOS Y SUEÑOS: LATIN-AMERICAN FANTASY IN SHORT STORIES AND FILMS 3 CREDITS

This course will explore the ways in which Latin American authors and filmmakers use fantasy to comment on social and personal themes like oppression, poverty, war, religion, and family. Latin-American literature is well known for magical realism –the expansion of reality to include fantastical elements in a realistic setting. The authors and filmmakers we will discuss in this course engage with the marvelous and the real along a large gamut touching different genres from fable to horror. They sometimes suggest subtle fantastic elements within realistic settings, and other times they introduce supernatural beings like ghosts or the devil as central characters in their narratives. Often recovering figures from folktales, mixing indigenous and Christian traditions, or adapting myths from other cultures into the Latin American context, the short stories and films selected find intriguing ways to represent reality through fantasy. Throughout the course, we will discuss short stories by authors from Argentina, Colombia and Mexico, and films by Guillermo del Toro and other Mexican filmmakers set in the Mexico of the Colonial period and the Revolution, and in Civil War Spain.

SS233 FILM AND SOCIETY 3 CREDITS

Through the analysis of film and television as texts, this course explores social issues such as race, class, gender, politics, education, religion, social and historical change, considering the ways film and television can reflect the realities behind sociological behavior. Students will reflect on the connections between film and society through in-depth discussions, presentations, readings, written responses, and research.

SS235 FINANCIAL PLANNING AND PRINCIPLES 3 CREDITS

This course provides a framework for personal financial planning through the study of economic principles including emphasis on the current economy and its effects on the individual and society as a whole. Through discussions, projects, and presentations students will gain an understanding of principles such as budgeting, credit and debt, and processes such as mortgages and retirement planning.

SS245 PHOTOGRAPHY AND THE HUMAN CONDITION 3 CREDITS

This course provides students with a general introduction to photography as an art form and reflection of the human condition. In this course, students will study the history of photography, famous photographers and photographs, photographs as a record of their subject, and also the artistic value of photographs. Students will explore various photographs to consider not only their aesthetic value, but also the relationships between artist, subject, and audience, as well as the social, historical, and cultural significance of these images. Students will pay particular attention to the stories photographs tell, from their subject matter to the way they are composed. Students will consider these stories when viewing and also when taking photographs, telling stories of their own.

SS250 PSYCHOLOGY OF LEADERSHIP 3 CREDITS

Drawing on psychological research at the level of the individual, group, and organization, the class focuses on how leaders think, feel, and behave. This course provides an opportunity for students to learn and discuss leadership theories, and to develop a personal leadership philosophy. Topics include visionary leadership, leadership development, goal setting, ethics, storytelling, charisma, systems thinking, and crucible experiences.

SS255 SELECT TOPICS IN PSYCHOLOGY 3 CREDITS

An exploration of the ways in which human behavior and mental processes relate to everyday life. Basic concepts of psychology are introduced with special emphasis on their application to the students' understanding of themselves and their interactions with others.

SS260 POSITIVE PSYCHOLOGY 3 CREDITS

Psychology is the study of cognitions, emotions, and behavior. This course is designed to provide a basic understanding of psychology, what we have learned about ourselves, and how psychology is applied to help improve our lives. The course focuses on the psychological aspects of a fulfilling and flourishing life. Psychology has often focused on deficits and disability. Recently, however, more focus has been placed on the more positive aspects of life. This course focuses on each person's unique potential for positive growth and development. Topics include happiness, self-esteem, empathy, friendship, goal setting, love, achievement, creativity, mindfulness, spirituality, and humor.

SS265 EXPLORING ETHICAL ISSUES 3 CREDITS

This course invites students to explore specific ethical dilemmas that arise in societal and professional settings and to consider how to approach and resolve these issues. Students have the opportunity to develop their abilities to reason and debate scenarios involving ethical questions. By developing practical models for thinking and refining techniques of approaching ethical dilemmas, students will pay particular attention to issues that arise in social and industrial settings. (Offered in the spring)

SS275 SPORTS AND SOCIETY 3 CREDITS

This course will examine the meaning of sports and the role sports play in American culture and society. Various sports will be studied from historical and contemporary perspectives to consider the connection between sports and such issues as race, class, gender, ethnicity, education, nationalism, health, socialization, and the role of the media. Students will reflect on the connections between sport and society through in-depth discussions, presentations, readings, written responses, and research

SS300 MILES MORALES VS. AMERICA 3 CREDITS

This course allows students interested in the history of pop-culture and movies to examine the relationship and intersection of race, culture, and technical achievement through the lens of "Spider-Man: Into the Spider-Verse"a 2018 animated film that is notable for its positive portrayal of Black, Latin, and Asian families in a genre that has a history of marginalizing characters from those backgrounds. Students would examine not only the movie, but also the history of comics and other media related to those portrayals. In addition to the cultural examination; metatextual analysis of animation technology, cast-building, and the movie would be part of the class overview.

SS309 SUSTAINABILITY AND THE HUMAN CONDITION 3 CREDITS

Through study of films, readings, websites and political policy, students will explore principles of sustainability with emphasis on how to meet human needs and reduce hunger and poverty while maintaining the life-support systems of the planet. Focus will be placed on discovering real ways that individuals, organizations, and governments can manage resources in a responsible manner, with minimal impact on the earth and its inhabitants. Discussion of solutions will include technological innovation, government and corporate policy, community organizations and individual advocacy.

SS311 THE HARLEM RENAISSANCE 3 CREDITS

In this course students would be able to survey the literature, history, and long-standing cultural impact of the Harlem Renaissance. Notable authors, texts, and events from that era would be examined with an eye towards understanding and coming to terms with how that era has shaped race relations in America and in local community advocacy, art, and politics.

SS318 BOSTON STREET ART IN THE COMMUNITY 3 CREDITS

This course takes a focused and rigorous look at key historical and contemporary social issues and how visual art talks back to –and pushes back against –these issues. This community based art class will provide students with a framework to begin understanding and evaluating their own communities from the perspective of artists and activists in those communities. The students will be encouraged to learn about the sociopolitical climates of those communities as well as documenting and having conversations not only about the art and artists, but also with the artists and activists in these communities.

SS319 SOCIETY AND TECHNOLOGY 3 CREDITS

This course examines the role of technology in contemporary social life. An overview of technological evolution and its impact on society from the Industrial Revolution to the present is explored, with emphasis on current technologies and the debates surrounding them. Through discussion, papers, projects, and presentations, students explore the impact of particular technologies on various aspects of human life, including society's increasing reliance on technology and the consequences on human existence.

SS390 THE EINSTEIN ERA 3 CREDITS

In addition to covering Einstein's core scientific and philosophical contributions, this course uses his life as a frame to explore broader historical issues, including war and pacifism, Zionism and Nazism, civil rights, celebrity, gender, and the nuclear arms race.

SS398 HISTORY OF ECOLOGY & ENVIRONMENTALISM 3 CREDITS

This course explores the historical development of ecology as a professional science, before turning to the political and social ramifications of ecological ideas. Throughout the course, we will situate the history of ecological ideas in their cultural, political, and social context.

SS400 MODERN BUSINESS OWNERSHIP 3 CREDITS

In this course students will collaborate with four business leaders (virtually or in-person) with the idea that they would be able to first examine the modern business models of the people they will be meeting, and then craft relative questions and ideas to take into that meeting.

SS401 REMEMBERING DEPORTATION & GENOCIDE IN FRANCE SINCE WWII 3 CREDITS

This course focuses on the memory and commemoration of deportation and genocide in France since World War II. The course will explore the complex ways in which French society remembers and forgets these historical events, and how memory is shaped by politics, society, and culture. We will analyze the evolution of memory over time, with a particular focus on the role of memory in shaping contemporary debates around immigration, racism, and nationalism. We will also examine the relationship between memory and justice, and the ways in which memory can be mobilized to promote social and political change.

TS201 ENVIRONMENTAL SCIENCE 3 CREDITS

An introduction to general science and 21st century issues. Topics include earth's systems and resources, water and land use, the living world, population and pollution. The course focuses on energy resources and consumption as a prerequisite to the study of photovoltaics and renewable energies. (Offered in the fall)

TS240 HUMAN ANATOMY AND PHYSIOLOGY 4 CREDITS

This course is an introduction to the basic structure and function of the various organ systems of the human body. Topics include normal versus pathological anatomy and physiology, examination of basic properties of nerves and muscles and their relationships to the central nervous system, and study of various functions of the respiratory, cardiovascular, digestive and urinary systems. (Offered in the fall)

TS310 GENERAL CHEMISTRY 4 CREDITS

Introduction to the fundamental principles of chemistry, including atomic structure, stoichiometry, the periodic table of the elements, chemical bonding, molecular structure, and states of matter based on kinetic theory. Laboratory work presents an introduction to methods of quantitative chemical techniques. (Offered in the fall)

Faculty

Olumide Adebayo, Lecturer in Computer Technology

Bachelor of Science degree in Computer Science, Master of Science in Technology Management and Ph.D in Technology Management all from the University of Bridgeport.

Ndidi Akuta, Lecturer in Computer Technology

Master of Science in Information Technology, concentration in Cybersecurity and Digital Forensics, Middle Georgia State University; Graduate Certification Cybersecurity, University of North Georgia; Bachelor of Science in Computer Science, Savannah State University

Richard Azzi, Professor of Computer Technology

B.S. in Computer Science, Mathematics, and Chemistry, University of Texas Pan American. M.S. in Mathematics, Texas Tech University

Sharon Bonk, Professor, Director of Library Services

B.A. in Journalism, University of Rhode Island; B.A. in Political Science, University of Rhode Island; M.L.S., University of Rhode Island

Rashian Burns, Lecturer in Computer Technology

Associates in Applied Science in Electrical Engineering from Technical Careers Institute and is currently pursuing his Bachelor degree in computer science from Hofstra University. Rashian is also certified in Kubernates administrator, solutions architect, cloud practitioner, and satellite and administration.

Craig Christensen, Associate Professor of Electrical Engineering

B.S. in Electrical Engineering, MIT; M.S. in Electrical Engineering, MIT; Ph.D. in Electrical Engineering, MIT

Tammy Chu, Lecturer in Health Information Technology

B. S., Mechanical Engineering, University of Hawaii; M.S. in Business Administration, University of San Francisco – Master of Business Administration; Project Management Professional Certified – 2003, Certified Scrum Master (CSM)

Tim Collins, Lecturer in Computer Technology

Master of Science in Information Systems, University of Phoenix; Bachelors of Science in Information Technology; University of Phoenix

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Associate of Arts in Physics from Fullerton College, Bachelor of Science in Electrical Engineering from University of California at Fullerton, Master of Science in Electrical Engineering from University of California at Fullerton, Master of Business Administration from Washington State University, and is currently pursuing Doctor of Philosophy.

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B.S. in Vocational Education, Fitchburg State College; M.Ed. in Occupational Education Administration, Fitchburg State College; M.Ed. in Instructional Design, University of Massachusetts Boston; Certificate of Proficiency in Automotive Technology, Franklin Institute of Boston, ASE Certified Automotive Technician and ASE G1.

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M. S. in Healthcare Administration, Simmons College; M.Ed. in Technology and Leadership, Kaplan University; B.S in Business Management, Northeastern University

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Assistant Professor and Program Chair for Biotechnology, PhD in Neuroscience from Albert Einstein College of MedicineJD focused on Intellectual Property from Suffolk University

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Associates in Science in Chemical Science, Bachelor of Science in Applied Math, and a Master in Business Administration from Curry College. Oscar has also earned his certifications in CompTIA A+, CCNA Network Fundamentals, and BMGI innovation and Design.

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B.S. in Mathematics, Ohio University; M.A. in Mathematics, University of Colorado

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B.S. in Women's Health, Lesley University; Associates in Radiological Sciences, Bunker Hill Community College

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Bachelor of Science in Marine Engineering Systems from US Merchant Marine Academy, Master of Science in Computer Engineering from New Jersey Institute of Technology, Master in Business Administration from Kaplan University, and is currently pursuing his Doctorate in Strategic Leadership

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September 2009 - December 2012 - Rensselaer Polytechnic Institute, Troy, NY, Master of Business Administration - Operations Management, September 2016 - May 2022 - University at Albany – SUNY, Albany, NY, M.Sc., Metallurgical Engineering, September 2006 - May 2009 - University of Tehran, Tehran, Iran, B.Sc., Materials Science and Engineering, September 2002 - August 2006 - Sharif University of Technology, Tehran, Iran

David Polson, Lecturer of Construction Management

M.S. in Construction Management, Wentworth Institute of Technology; Graduate Certificate in Operations Management; Worcester Polytechnic Institute; B.S. in Management Lesley University and A.S. in Electro-Mechanical Technology, Licensed MA Construction Supervisor.

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Earned his education hours towards his Journeymen License through Everett High School

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Master of Science in Forensic Toxicology, University of Florida; MS in Environmental Education, Texas A&M University; BS in Marine Biology, Texas A&M University

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Greg Sonek, Associate Professor of Electrical Engineering

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Leslie Tuplin, Assistant Professor of Construction Management - CM Chairperson

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B.A. in Political Science and Austrian Economics, University of Massachusetts Amherst; J.D. in Business Transactions and Regulation, American University Law School; MBA in Long-Term Strategic Planning and Integration, Suffolk University School of Management

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Chair, Eye Health Technology; M. Ed., Cambridge College; B.S. Business Management, Boston College; A.S. Opticianry, Optical Institute at Newbury College; American Board of Opticianry Master in Ophthalmic Optics; MA Licensed Optician.

Lap Yan, Assistant Professor in Construction Management

Chair, Business Management Bachelor of Architecture from New York Institute of Technology, Master of Business Administration from New York University, and is in dissertation phase for his doctorate in Social Policy at Fordham University.

Mostapha Ziad, Lecturer of Electrical Engineering

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Director of Curriculum Development and Assessment

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Executive Director of the Center for Computing and Interdisciplinary Technology

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Executive Director of the Center for Energy Efficiency and the Trades,

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DR. CARLOS VALENTIM
Data Analyst

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Dean of Students

SHAWN AYALA
Associate Dean of Students

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Director of Learning

SHARON BONK
Director of Information Literacy / Distance Learning Librarian

Success Coach Team

WONGLY SINE
Lead Student Success Coach

ANNA DAVIES
Student Success Coach

TBA
Student Success Coach

Career Services

MICHAEL FELIX
Director of Career Services

KWANNA WISE
Career Navigator

Student Wellness

EMMA MICHALOWSKI
Director of Student Wellness and Support

Office Finance and Operations

KEVIN HEPNER
Chief Financial Officer

ALAN BLAIR
Controller

Financial Aid

SHANI WILKERSON
Director of Financial Aid

Facilities

MYFTAR MYRTAJ
Director of Facilities

SELVIN PEARSON
Custodian

ZHANETA PECOLLARI
Custodian

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ELSIE CAPONE

Business Office Manager

Office of Admissions

MIN CHEN

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Assistant Director of Admissions

KWEISI JOHNSON

Enrollment Systems Specialist

JAMES KLASEN

Assistant Dean of Records and Research

DARNELL STOWERS

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Early College

LARA TAVARES

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ANDREW TARSY
Emblem Strategic

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AdeptID

RAHUL YARALA
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Index

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