

**Action Report**  
for the  
**Industrial Technology**  
**(retitled as Engineering Technology)**  
Program  
at  
**Fitchburg State University**  
160 Pearl Street  
Fitchburg MA 01420



**December 2020**

The information supplied in this Program Review Report is for the use of Fitchburg State University and its authorized agents, and should not be disclosed without authorization.

### **A. Qualifications of the External Reviewer**

Tarek Abdel-Salam, Ph.D., Professor and Associate Dean for Research and Graduate Studies conducted our external review. Dr. Abdel Salam is also Director, Center for Sustainable Energy and Environmental Engineering in the College of Engineering and Technology at East Carolina University. His email and contact information are [abdelislam@ecu.edu](mailto:abdelislam@ecu.edu) and 252-328-9649

Dr. Abdel-Salam is uniquely qualified to conduct our program review. He has an extensive background in both engineering and engineering technology programs and was one of the founding professors of the engineering program at East Carolina University. In his role as Associate Dean for Research and Graduate Studies and the Director for the Center for Sustainable Energy and Environmental Engineering, he monitors the College of Engineering and Technology (CET)'s compliance with the University's policies and procedures related to research. He reviews new faculty startup fund proposals. He served as the liaison for the college with the ECU graduate school and with the departmental graduate directors and chairs within the college on matters related to graduate programs. He also served as a liaison for the college with the ECU Division of Research. He facilitated and supported faculty research efforts.

### **B. Description of the Department's Response Process**

The Process: The External Review report was received by the Dean of Business and Technology on November 5, 2020. The Dean transmitted the report to the Department Chair who distributed the report to the faculty. The faculty were asked to study the report and prepare responses. Two faculty members were charged with collecting the responses and preparation of a draft outlining the planned actions and measures to realize the benefits of the recommendations. This draft was further discussed and brought to its current format and approved by all Faculty, Department Chair, and the Dean.

### **C. Department's Summary Response to External Review Report**

We concur with Dr. Abdel-Salam's analysis of our program and will implement many if not all of his recommendations.

Overall, the external review confirmed that the 7 student outcomes are sufficient and we have developed an effective strategy for six faculty members assigned as student outcome coordinators. We agree with Dr. Abdel Salam's observations that the four courses selected to be used for the assessment of student outcomes are appropriate but lack sufficient coverage of laboratory activities and related performance indicators. These four courses include ENGT 1700, ENGT 2020, CMGT 3035 (previously listed as ENGT 3035), and ENGT 4903. We will address these shortcomings in our list of corrective actions.

In addition to shortcomings related to the laboratory component, we also concur that our performance indicators for the Engineering Technology program should focus more on concrete measurable indicators of achievement of the outcomes which are broad statements of the expected learning. We also agree with Dr. Adel-Salam analysis and recommendations with regard to a new concentration in the area of environmental engineering in response to the increase in the number of employers who hire civil, coastal, environmental, and water resources engineers. Indeed this new concentration is timely given the urgency and the need for trained work force in the area of resilient and sustainable infrastructure. Such concentration as correctly stated by Prof. Abdel-Salam is a good opportunity for engaging undergraduate students in applied research projects from industry and from federal agencies that will contribute to student success. We are exploring the possibility of collaboration with the Earth & Geographic Science Department as well as soliciting input from regional stakeholders such as the Public Works Commissioner at City of Fitchburg and others public and private sectors stakeholders entities in Massachusetts.

#### **D. Departmental Action Items Related to External Review**

Following are the action items related to the report grouped by External Evaluator's Review subtitles and program criterion for the ABET Engineering Technology Accreditation Commission (ABET ETAC):

##### **STUDENTS**

###### **(ABET Criterion1: Students)**

###### **External Evaluator Analysis and Recommendations:**

Students are excited about their concentrations and they see a great value in the core courses. Students are satisfied with the level of interaction. Students liked and appreciate the restructuring of the program. This is an area of strength.

Students value professional organization. However, not many students participate in them. This could be due to small numbers in some concentrations, lack of interest, or lack of available time. One suggestion is to offer some of these activities through elective courses, or as a capstone project. ATMAE and ASME robotic competitions, SAE Baja car, can be some examples. They include design and engineering analysis that can be used to assess student outcomes. A lot of information and experience from other schools can be found in the ASEE publications.

It was mentioned during the meeting with students that physics II is a repeat of the electronics class. This needs some arrangement with the physics department.

Although the feedback was from two students only but, advising seems to be an area that needs improvement. Lack of communication between the student and the substitute advisor was mentioned.

Students appreciated the opportunity to get their feedback during my meeting with them. It is recommended to engage students and collect their feedback in matters related to curriculum and assessment. This can be achieved by different ways, for example, some students can be invited to meet with the advisory board, it could be during lunch to provide informal feedback.

###### **Planned actions by Engineering Technology program to address recommendations outlined above:**

1. Continue to promote professional organizations. Continue to pursue the department's goals for Solar decathlon and SAE Formula and Baja competitions
2. Review the content in General Physics II which students see as a repeat of the Electrical Systems and Circuits class. This needs some coordination with the physics department.
3. Review the quality of advising in the program. Continue to stress the full implementation of the of Student Success Collaboration (SSC) system and create transition processes when students changes advisors.
4. Engage students and collect their feedback in matters related to curriculum and assessment. Invite students to meet with the advisory board during lunch or other opportunities to provide informal feedback.

## CURRICULUM AND ASSESSMENT

### (ABET Criterion 2: Program Educational Objectives)

#### External Evaluator Analysis and Recommendations:

The Engineering Technology program has no external advisory board, however there is a plan for establishing one. It is highly recommended that the program establishes one soon.

The engineering Technology Advisory Board (ETAB) could be the primary organizational vehicle to represent regional government, industry, and employers in development and review of the program objectives, outcomes, and assessment results. This group should meet twice annually.

#### Planned actions by Engineering Technology program to address recommendations outlined above:

1. Continue with the formation of the external advisory board.
2. Obtain feedback from the program external advisory board
3. Revise the program educational objectives and mission.

### (ABET Criterion 3: Student Outcomes)

#### External Evaluator Analysis and Recommendations:

Revise the student outcomes and gather feedback from the program advisory board. Definitions can be found in the document Criteria for Accrediting Engineering Programs: 2019-2020  
<https://www.abet.org/accreditation/accreditation-criteria/>

Consider developing an evaluation form with performance indicators for the capstone course and related projects.

Perhaps an additional student outcome (outcome 8) should be added for each of the program concentrations. A suggestion for outcome 8 might be as follows: an ability to apply engineering concepts to an area of concentrated study, chosen from architectural, electronics engineering technology, energy management, engineering technology, or manufacturing engineering technology.

Each concentration should have a specific version of outcome 8. For example, manufacturing engineering: graduates of the engineering technology program will demonstrate an ability to design and analyze integrated systems that include people, material, equipment, and energy.

#### Planned actions by Engineering Technology program to address recommendations outlined above:

1. To facilitate the realization of the benefits of the above outlined recommendations (Criterion 1 thru the action plan outlined in the Table 1 below was discussed and approved in the 12/08/2020 faculty meeting.

**Table 1: ABET Committee tasks in response to Evaluator’s recommendations& ABET readiness**

Item	Responsibility	Task Description	Remarks
1.	<b>ABET Committee:</b> Prof Chenot, Dr. Basu & Dr. Mustafa	<ul style="list-style-type: none"> <li>- Revise the mission statement of the program to better reflect the regional needs that have been identified.</li> <li>- Revise the program educational objectives and obtain feedback from the program external advisory board.</li> <li>- Revise the student outcomes, add another outcome (outcome #8) and gather feedback from the program Advisory Board.</li> <li>- Review content for Physics II</li> <li>- Review the list of performance indicators.</li> <li>- Design Evaluation Form for the Engineering Technology Capstone.</li> </ul>	<p>Dr. Mustafa has been asked to draft a program mission statement and objectives for the consideration of ABET&amp; curriculum Committee</p> <ul style="list-style-type: none"> <li>- This item is to be closely coordinated with Engineering Technology Capstone Course Instructor(s)</li> </ul>

(ABET Criterion 4 Continuous Improvement)

External Evaluator Analysis and Recommendations:

Develop Key Performance Indicators for Outcomes and ensure that performance indicators assess laboratory skills related to analyzing and interpreting data and conducting experiments.

1. Establish a new department assessment committee that is responsible for (a) updating the assessment plan; (b) preparing the annual report of the assessment; (c) presenting results to faculty and advisory board, and; (d) maintaining all of the assessment records.
2. Ensure that course coordinators will (a) collect required assessment data; (b) maintain updated syllabi and course materials for course display.
3. Ensure that concentration coordinators (a) review the assessment data relative to their concentrations and prepare annual summary.
4. Review the systematic process for assessing and evaluating the extent to which student outcomes are being attained and use the results of this evaluation as input for continuous improvement. These assessment methods which are already included in the program plan include (a) Direct measure of student outcomes; (b) Student work samples from selected courses (lab reports, oral presentations, specific assignments, targeted exam questions etc.); (c) evaluation of capstone projects; (d) student exit survey (outcome specific), and; (e) student course survey (outcome specific)

Planned actions by Engineering Technology program to address recommendations outlined above:

To facilitate the realization of the benefits of the above outlined recommendations the action plan outlined in the Table 2 and Table 3 below was discussed and approved in the 12/08/2020 faculty meeting

**Table 2: Assessment Committee Tasks**

<u>Item</u>	<u>Responsibility</u>	<u>Description</u>	<u>Schedules/Deadlines</u>
1.	<b>Assessment Committee:</b> Dr. Whitfield, Dr. Mustafa & Dr. Mani	<ul style="list-style-type: none"> <li>- Identify courses for outcomes assessment.</li> <li>- Add Direct &amp; Indirect Assessment Methods as outlined in Evaluator’s Recommendations.</li> <li>- Design a continuous improvement plan</li> <li>- Preparing the annual report of the assessment</li> <li>- Updating the assessment plan</li> <li>- Presenting results to faculty and advisory board</li> <li>- Maintaining all of the assessment records.</li> </ul>	These items need to be coordinated closely with ENGT-ABET accreditation committee.

**Table 3: Concentration Coordinators Tasks**

<u>Item</u>	<u>Responsibility</u>	<u>Description</u>	<u>Schedules/Deadlines</u>
	<b>Concentration Coordinators:</b> Prof Chenot, , Dr. Hong Dr. Basu Dr. Kaul	<ul style="list-style-type: none"> <li>-Maintaining updated syllabi and course materials for course display.</li> <li>-Add student outcome to each of the concentrations per Evaluator Recommendation</li> <li>-Collecting the required assessment data.</li> </ul>	These items are to be closely coordinated with the Assessment Committee & ABET Committee

**Additional Concentration in Environmental Engineering**

External Evaluator Analysis and Recommendations:

Dr. Abdel-Salam analysis and Recommendations:

In general, there is an increase in the number of employers who hire civil, coastal, environmental, and water resources engineers. The National Academy of Engineering has identified providing access to clean water, managing the nitrogen cycle, and restoring and improving urban infrastructure as three of their 14 Grand Challenges for Engineering in the 21st century. The US Bureau of Labor Statistics has predicted a 5-9% increase in civil, environmental, and marine engineering jobs from 2018 to 2028.

This concentration might be a good opportunity for engaging undergraduate students in applied research projects from industry and from federal agencies that will contribute to student success. However, this might be difficult at this time with faculty average research time of 5%.

It is important to clearly define the focus of this concentration based on the regional need. Also, a prediction of the number of students who will be interested in the concentration will be required. This can be achieved by sending surveys to the current students and to the alumni. An area that needs to consider carefully, especially in a general program, is the impact of this new fifth concentration on the enrollment in the other program concentrations, as students will most likely be from the same Engineering Technology program.

Based on the current profile of the program faculty, there will be a need for additional faculty. This might be difficult to justify without a strong evidence of the increase of student enrollment from outside the program.

**Planned actions by Engineering Technology program to address recommendations outlined above:**

1. The focus of the new concentration and the regional need: A proposal for additional concentration with components in civil and environmental engineering technology concentration and minor with a focus in environmental engineering sustainability are being considered. The new concentration will utilize a number of existing civil and environmental engineering courses that were approved by the University Curriculum Committee (AUC 2018, 2019) such as ENGT 3034: Water and Wastewater Management ENGT 3000:Energy and Sustainable Practices, ENGT4038 :Seminar in Civil and Environmental Engineering Technology as well as other carefully selected courses from the Earth& Geographic Science Department at Fitchburg State, such as GEOG 2056: Climate Change and Human History, GEOG 4500: Remote Sensing of the Environment among others (See attachment **A** for the enthusiastic faculty reception expressed in the response of the Earth& Geographic Science Department to collaborate on the New Proposed Concentration). The proposed curriculum for the concentration and the minor will build on the background courses provided by the Engineering Technology Program core and on other Liberal Art and Science requirements such as Chemistry (CHEM 1300), MATH 1300, Technical Calculus (MATH 2100). And courses designated as civic learning (CL) in the new LA&S requirement to provide a well-rounded curriculum to train perspective students in the necessary knowledge, skills and attitudes required for planning, design, development and maintenance of sustainable infrastructure such as storm-water, Drinking water and Environmental protection facilities at the state and local levels (see correspondence with City of Fitchburg, MA, Public Works Commissioner, as part of the documentations for the need for water and wastewater technologists in Central Massachusetts region , Attachment **B**).

2. A good opportunity for engaging under grad students in applied research: Although Fitchburg State is primary a teaching institution, Faculty are provided with one day per week research allowance. The Library staff at Fitchburg State University offer support and multiple and ample opportunities for Faculty Research. In fact, some faculty in the Department are engaged in environmental engineering and sustainability studies and research (for example, Dr. Mustafa has published two books on water resources engineering and Dr. Kaul two books on Sustainable Energy Management).This concentration can indeed be an opportunity to engage undergrad students in Applied Research with local industry and public agencies. Applied research is currently done every spring semester (pre-COVID) university-wide. Research projects in area of the civil and environmental projects are supported both at local and state levels as well as by the private sector thru internships. This engagement with applied research can be continued and further expanded using the proposed new concentration.

3. Prediction of the number of students and surveys: To assess the regional demands for civil and environmental engineers and to help with prediction and forecast of expected enrollment in the new concentration, a research has been conducted and data compiled and to be used to support the new concentration proposal application. Data sources mined, include, as recommended, regional employment data sources as, among others: US Bureau of Labor Statistics (<https://www.bls.gov/ooh/architecture-and-engineering/civil-engineers.htm>) Official Website of the Executive Office of Labor and Workforce Development (EOLWD) and, STEM Occupation Projections in Massachusetts: [http://lmi2.detma.org/lmi/Occupation\\_Projection\\_jobsSTEM.asp?area=01000025long](http://lmi2.detma.org/lmi/Occupation_Projection_jobsSTEM.asp?area=01000025long)

4. Students' interest: The students' interest is being documented to support the New Concentration application (see Attachment C). A survey is planned to gauge the interest of other stakeholders (employers) and other public entities (thru correspondence with, among others, State and Municipal Public Works Officials such as the one shown in Attachment B with Public Works Commissioner mentioned above).

5. The impact of the new concentration: The program is geared to serve students with an interest in the field of civil and environmental engineering and those interested in research and pursuing a masters' degree in the field in the future. Civil engineering students will benefit the most from the highly desired and currently pursued ABET accreditation by the Department. The civil engineers usually take the Fundamental of Engineering (FE) and Professional Engineering (PE) license in large volumes compares to other disciplines (see the volumes of the PE Civil provided by the National Council of Examiners for Engineering and Surveying (NCEES) in the US available: <https://ncees.org/engineering/pe/pass-rates/>). Although, the new concentration will provide additional viable alternative to some of our existing students within the *Applied science & Technology* (especially construction management) who show interest and aptitudes for higher math and calculus and who are eager to pursue engineering (see for example, student emails in Attachment A), the primary focus of recruitments will be new students.

In line with the department and the university mission, core values and emphasis on accessibility and diversity, additional effort will be exercised to attract veterans, under-represented and minorities' students to the new concentration. Building on our own past experiences prior/during our current teaching careers- and on the achievements of the civil and environmental engineers in general- we will explain the multiple benefit of pursuing a career in civil and environmental engineering including the potential to obtain the prestigious Professional Engineering License (PE) to prospective students. The focus on these benefits will be front and center in our recruiting plan to attract prospective students from technical and high schools in the regions to this new concentration. Using both existing agreements with these region high schools and developing new ones. The plan is, to use this new concentration and its relevance to the need for sustainable adaptation and mitigation solutions to global warming and climate change as a marketing tool to improve our programs overall enrollment numbers.

## **LABORATORY COMPONENT OF THE COURSES:**

(ABET Criterion 5: Laboratory Courses)

External Evaluator's Analysis and Recommendations:

Include a clear set of lab activities in the syllabus (L.1)

Require engineering analysis and interpretation of data in the lab reports (L.2)

Establish a set of measurable key performance indicators extracted from the student outcomes. According to ABET, the performance indicators should focus on the data collection process. The performance indicators should be communicated to the students (L.3).

Consider offering these laboratories as individual 1 credit hour courses (L.4).

An ABET example:

Outcome: Students should be able to conduct an experiment and interpret data

Performance indicators:



Students will be able to demonstrate the ability to:

Follow the design of an experiment plan (knowledge); Acquire data on appropriate variables (application); Compare experimental results to appropriate theoretical models (analysis); Offer explanation of observed differences between model and experiment (evaluation).

To facilitate the realization of the benefits of the above outlined recommendations (Criterion 1 thru the action plan outlined in the Table 1 below was discussed and approved 12/08/2020.

<u>Item</u>	<u>Responsibility</u>	<u>Description</u>	<u>Schedules/Deadlines</u>
1.	Laboratory Committee: Dr. Whitfield, Dr. Mani & Dr. Hong	<ul style="list-style-type: none"> <li>- Identify courses with lab components and liaise with instructors to include relevant lab activities that leads to relevant learning outcomes including outcome mention in Recommendation# L.2.</li> <li>- Identify lab needs and budgets to support lab activities mentioned above</li> <li>- Coordinated with ENGT- ABET Committee to establish lab related key performance indicators as outlined in Recommendation #L.3.</li> </ul>	

## RESOURCE & SUPPORT

### (ABET Criterion 6: Faculty)

The following engineering technology faculty have accepted nomination as PTC Industry Fellows and have volunteered to integrate PTC tools into their engineering technology and applied sciences courses.

1. Sanjay Kaul (Department Chair and ENGT - Energy Management Lead)
2. Wayne Whitfield (Applied Sciences - Tech Ed Lead and ENGT)
3. Soumi Basu (ENGT - Manufacturing Lead)
4. Hong Yu (ENGT - Electronics Lead and Applied Sciences);
5. Nirajan Mani (Applied Sciences - Construction Management Lead and ENGT)

### (ABET Criterion 7: Facilities)

The following is a list of action items (**short of full facilities renovation**) will help align CNIC 104 Laboratory to support the ENGT curriculum and innovations brought on by digital transformations including cloud collaboration for CAD, industrial internet of things (IIoT) and augmented reality (AR) tools.

1. Add a new door (or cut a window in the existing door) to make the CNIC 104 lab more welcoming
2. Add a help desk in the front of the lab to support inventory management and check out of hand tools
3. Add 8 Eaton Desks (60x30 mobile adjustable height, c-channel legs) with 32 vinyl padded shop stools (H-7670)
4. Paint, clean, and add additional lighting as appropriate. Remove foundry due to concerns over cleaning/safety
5. Upgrade existing milling machines and lathes and install 3D printers and computer workstations that support PTC related IIoT, AR, and cloud CAD tools including Vuforia Chalk, Onshape SaaS, Creo, and Windchill.
6. Install appropriate webcam feeds to support virtual tours for recruiting and IIoT collaboration among regional partners including MWCC, QCC, Monty Tech, and CPS affiliated employers including Epic Industries, AIS, Micron Products, and Jabil Healthcare

The University has begun longer term facility needs for the Department with preliminary design information gathered and quantified (Spring 2020) by the architectural/planning firm of Doker Lidsky Craig & Associate. We anticipate and look forward to continued progress in updating and modernizing our facility needs.

#### **SUMMARY OF ACTION PLAN**

See Table 4 below for summary of action plan.

**Table 4: Summary of Engineering Technology Action Plan (Fall 2020)**

<b>Specific area where improvement is needed</b>	<b>Evidence to support the recommended change</b>	<b>Person(s) responsible for implementing the change</b>	<b>Timeline</b>	<b>Resources needed</b>	<b>Assessment Plan</b>
Continue the department's goals for solar decathlon and SAE Formula and Baja competitions	Ongoing development of capstone projects involving solar decathlon and SAE Formula	Faculty teaching within the ENGT program core	Spring 2021	\$5,000 per year	The capstone project provides critical indicators for ABET continuous improvement criterion.
Review the content in physics II which students see as a repeat of the electronics class	Student feedback to External Reviewer	Department Chair and Curriculum Committee	Spring 2021	None	No
Review the quality of advising in the program	Student feedback to External Reviewer	Department Chair and Dean	Spring 2021	None	Advising is critical element of ABET criterion for student support
Engage students and collect their feedback in matters related to curriculum and assessment	Student feedback to External Reviewer	Department Chair	Spring 2021	None	
Establish an Engineering Technology Advisory Board (ETAB)	ABET Requirement	Department Chair	Spring 2021	None	Advisory Board is critical for ABET criterion 2
Review the program educational objectives (PEOs) with the ETAB and obtain feedback and revise PEOs as needed. Review the student outcomes with the ETAB and Alumni and revise as needed.	ABET Requirement	Department Chair	Spring 2021	None	Systematic review of PEO is critical evidence for ABET criterion 2
Develop an evaluation form with performance indicators for the capstone course	External Reviewer Recommendation	Department Chair	Spring 2021	None	
Consider an additional student outcome (outcome 8) for each program concentration	External Reviewer Recommendation	Department Chair	Spring 2021	APR for program coordinators	
Develop Key Performance Indicators for all Outcomes	External Reviewer Recommendation	Department Chair	Spring 2021		Systematic review of student outcomes is critical evidence for ABET criterion 3 and 4

Establish a departmental assessment committee	External Reviewer Recommendation	Department Chair	Spring 2021	\$200 stipend for each faculty during summer	Essential for systematic review of outcomes and for ABET criterion 2, 3, and 4
Ensure that course coordinators will (a) collect required assessment data; (b) maintain updated syllabi and course materials for course display	External Reviewer	Department Chair	Spring 2021 and Fall 2021	None	
Ensure that concentration coordinators (a) review the assessment data relative to their concentrations and prepare annual summary.	External Reviewer	Department Chair	Summer 2021	\$100 stipend	
Review the systematic process for assessing and evaluating the extent to which student outcomes are being attained and use the results of this evaluation as input for continuous improvement	ABET Requirement	Department Chair	Ongoing	None	Systematic review of student outcomes is critical evidence for ABET criterion 3 and 4
Review the need for an additional Concentration in Environmental Engineering	Department Faculty	Dean and Provost	Spring 2021	Faculty position	
Consider offering Laboratory as individual 1 credit courses	External Reviewer	Department Chair and Curriculum Committee	Spring 2021		
Complete nominations for engineering technology faculty as PTC Industry Fellows	External Reviewer suggestion for industry engagement	Dean and Provost	Fall 2020	\$200 stipend	
Upgrade CNIC 104 to support the ENGT curriculum and disruptions brought on by digital transformations	External Reviewer suggestion for industry engagement	Provost, Dean, Chair, VP for Development, VP for Facilities, Laboratory Committee	Spring 2021, Summer 2021, Fall 2021	\$50,000	

### **Schedule Toward ABET ETAC Accreditation**

1. On completion of the action items discussed above, the department will assess the request for a 2021-22 Readiness Review Evaluation (RREv) during the 2022-2023 Readiness Review Cycle. We anticipate information specific to the 2022-23 Readiness Review Cycle will become available in March 2021.
2. We anticipate informing ABET of our intent for the Readiness Review by completing the online RREv document preferably before September 1, well before the October 1 deadline for submitting the required Readiness Review Report and transcript.
3. We will submit the Readiness Review Report along with one transcript for the Engineering Technology program by October 1 of the year before we plan to submit a Request for Evaluation (RFE). The Readiness Review report will be submitted with a scanned copy of one graduate's official transcript from the most recent graduating class.

### **CONCLUSION:**

The External Reviewer Report and the included recommendations enabled us to see our program better. To be more aware of gaps. To celebrate strengths. More importantly, to plan and put in-place scheduled tasks to improve the program and to pursue stated objectives such as ABET accreditation with more clarity. We want to thank Dr. Tareq Abdel-Salam for his thorough and rigorous analysis and sensible pragmatic recommendations, and our colleagues: faculty and staff for their committed promise to realize the task outlined in this response. We also would like to express our gratitude to our Department Chair, and Dean Keith Williamson for their guidance and visions and the University Administration for their committed promise of financial support to make the recommended measures a reality to benefit our students.

Sincerely,

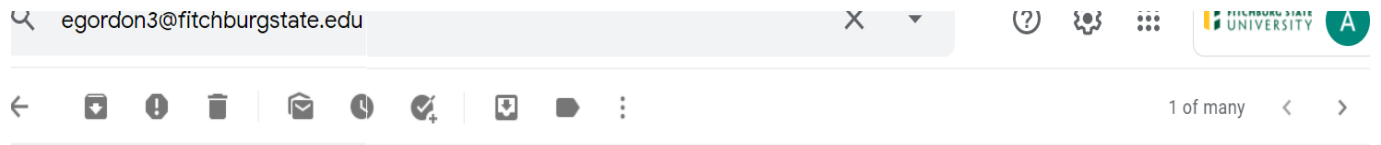
Engineering Technology Program  
Fitchburg State University

### **Attachments:**

Attachment A- Correspondence with Earth & Geographic Science Department.  
Attachment B- Correspondence with the Commissioner of Public Works, City of Fitchburg, MA  
Attachment C- Students interests in the New Concentration

# Attachment A

## Correspondence with Earth& Geographic Science Department



Dear Dr. Gordon,

Hope all is well. Last year we met with you when we were making changes to our programs ( moving from Industrial Technology to our current program: Engineering Technology. After more than 50+ AUC applications! We managed to do it)

During that meeting we talked briefly about our intention to launch a Civil Engineering Technology Concentration that contains an Environmental Engineering component. The main objective is to prepare our students with skills, knowledge and attitudes necessary for the planning, design and implementation of sustainable infrastructure development and environmental protection (Attached is a copy of the proposal on AUC Form).

We plan to advise our students to take about 9 credits from the Earth & Geographic Science Department course offerings to augment and strengthen environmental engineering learning. These courses are highlighted in green on attached AUC form (see Curriculum Requirement Table)

We are reaching out to solicit your advice with regard to the suitability of the courses, their sequence (for example, are there other courses that we should explore?), and to assure that we would do all necessary coordination to avoid any negative impact to your schedule. We would definitely appreciate any suggestions that would enable the Concentration and its environmental component to achieve their planned objectives and outcomes outlined in the attached proposal.

We believe this provides another great opportunity for collaboration between our two departments. For example, this might create additional possibility to collaborate on a joint minor in Environmental Engineering (3 carefully selected courses from the Engineering Technology and 3 courses from the Earth & Geographic Science -a total of 18credits to meet FSU requirements for minors) when this Concentration is approved and in the books.

When your schedule allows, it would be great if we can have a similar discussion to the one we had last year. To include in addition to our Curriculum Committee, our department chair as well (ccd on this email).

On behalf of the Engineering Technology Curriculum Committee  
Thank you so much for your consideration and best regards.



**Elizabeth Gordon**

Dec 5, 2020, 4:31 AM (6 days ago)



to me, David, Sanjay, Nirajan, Soumitra, Wayne, Hong ▾

Hello Abdel,

Thank you for the email - this is an exciting opportunity for collaboration across our departments. It would be great to have a chance to meet with a few faculty members to discuss appropriate coursework. I'll forward this proposal to relevant faculty in our department in the meantime. One of our newer faculty members, Elyse Clark, is adding a new water resources course to our curriculum and is currently developing a soils course to be offered next year, so I could imagine those courses might fit into this curriculum. I would also flag that our computer cartography and geospatial technology course may not receive an integrated and applied LAS designation, though GIS will.

Would it be possible to make arrangements to meet in early to mid January?

Thank you again for sending this along and I look forward to working together on this and a potential minor!

Liz

# Attachment B

## Correspondence with Fitchburg City, MA, Public Work Commissioner



FSU Engineering Tech Inbox x



**Bosonetto, Nicolas** <NBosonetto@fitchburgma.gov>  
to me, Jeff, John ▾

Thu, Mar 12, 3:34 PM ☆ ↶ ⋮

Gabar,

It was very nice meeting and talking with you today. I'm cc'ing Deputy Commissioner of Wastewater Jeff Murawski and Deputy Commissioner of Water Supply John Deline. Per our conversation, the treatment industry as a whole is facing a shortage of qualified operators to run our water/wastewater treatment plants and we would be more than happy to meet with your faculty/students to encourage them to enter these fields. Operators make good money with good salaries and the facilities are very safe. We would be happy to come in and discuss the training paths students would need to take to become certified operators.

Thank you,



**Nicolas H. Bosonetto, P.E.**  
**Commissioner of Public Works**  
**City Engineer**  
**301 Broad Street**  
**Fitchburg, MA 01420**  
**978-829-1912**



## Attachment C

### Students Interest in the New Concentration

mperla2@student.fitchburgstate.edu

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#### Civil Engineering Request Inbox x

 **Marcus P** <mperla2@student.fitchburgstate.edu> Mar 4, 2020, 2:19 PM

to me

Hello Prof. Mustafa

As stated earlier in class, it would be great to have a civil engineering program or curriculum available at FSU. I originally found myself at this school with an interest in construction management, but after a few interesting math and engineering classes I've taken in my college career, it becomes more clear that engineering is where my heart and mind feel truly whole. I'm already discussing with one of my professors about becoming an engineer in electronics but if there was a way to make civil engineering a possibility then both my passion for construction and heart for engineering would be content.

I'm reaching out in hopes that this email helps further emphasize the need for a civil engineering program.

Thank you for your time

-Marcus Perla


jmurp110@student.fitchburgstate.edu




2 of 7 < >

 **John Murphy** <jmurp110@student.fitchburgstate.edu>  
to me ▾

Fri, Oct 30, 3:34 PM ☆ ↶ ⋮

 This message was not sent to Spam based on your organization's settings.

[Move to spam](#) 

Hello Dr. Mustafa,

My name is John Murphy, I'm currently an undeclared sophomore in the Industrial Technology department. I was reaching out to you for some advice on classes I should take this 2021 spring semester.

I decided to come to Fitchburg State in hopes of putting myself in a better place in order to obtain a high paying job and a successful career. My father has been a construction worker his whole life, and I enjoy working in the construction field, so I figured It'd be a possibility to major in Construction Management. Although there are other concentrations such as architecture that is also an option I see for myself. Another concentration I'm interested in is civil engineering, and I know Fitchburg State doesn't offer it, but there's the possibility I could transfer to pursue it.

So I've come to you in hopes of some insight on major options, and career paths and possibilities.

Thank You,  
John Murphy

(no subject) Inbox x



**John Murphy** <jmurp110@student.fitchburgstate.edu>  
to me

Mon, Nov 2, 11:17 AM

Hello Dr. Mustafa,  
I was reaching out to you to see if the University had given any more updates into the idea of adding a Civil Engineering Concentration/Program.  
Thank You,  
John Murphy



**Abdel Mustafa** <amustafa@fitchburgstate.edu>  
to John

Mon, Nov 2, 2:48 PM

Thanks, John.  
The proposal is under consideration with the department curriculum committee. Will let you know when I hear back.  
Prof Mustafa

Hello,  
Hi my name is Joe Murphy and I'm a freshman here at fitchburg state. Currently I'm undeclared, although I have been leaning towards Industrial Technology for a while. I wanted to reach out to you to maybe set up a time where we can talk about career options and major paths. Aswell as go over my potential spring schedule.

Thank you,  
Joe Murphy



**Abdel Mustafa** <amustafa@fitchburgstate.edu>  
to John

Nov 15, 2019, 1:17 PM

Joe,  
Thank you for reaching out. Would be glad to meet with you. My office hours are: Tuesdays/Thursdays: 9:30-12:30  
Let me know when you will be stopping by.  
Prof Mustafa