

Submit on blue paper

COURSE / CURRICULUM MODIFICATION REQUESTCOLLEGE **Technology******COURSE CHANGE**

- ☐ Create new course
☐ Eliminate course
☐ Modify existing course (mark all that apply):
- ☐ Title ☐ Description ☐ Prerequisite
☐ Course content
☐ Course number (old course number to be deleted)
☐ Credit Hours ☐ Term offered
☐ Contact Hours
☐ Method of instruction (see table on reverse)
☐ Web-centric
☐ Web-based (definitions on reverse)

Requested Course change effective date: _____ (Semester/Year)

Implemented by Registrar, effective:

**reviewed by Undergraduate Council if it has broad impact

PROGRAM CHANGE**Program Name:** **Electronics and Computer Engineering**

- ☐ Minor change to program requirements/checksheet
☐ Change program name
☒ *Create new program and new program code (check one):
☒ degree ☒ major ☐ minor
☐ specialization ☐ certificate
☐ *Major change to program requirements/checksheet
☐ *Program to be available 100% online
☐ *Add, delete, modify program matriculation requirements
☐ *Suspend admission to and/or eliminate a program

Requested Program effective date: **Fall 2023** (Semester/Year)

Implemented by Registrar, effective:

*reviewed by Undergraduate Council

CATALOG DESCRIPTION for a new or modified course, OR BRIEF OVERVIEW of program change (limit 675 characters):

As part of an upcoming restructuring, the College of Technology, Architecture, and Applied Engineering has been approved to develop a School of Engineering that supports the university's strategic plan, FORWARD. The College currently houses one undergraduate engineering program, Systems Engineering, and is working to transition existing engineering technology programs into engineering programs. The proposed change is to transition the current B.S in Electronics and Computer Engineering Technology program into a B.S. in Electronics and Computer Engineering. The transition from engineering technology to engineering requires changes that include renaming the program, updating course content, adding new courses, renaming courses, and adapting existing program learning outcomes to meet standards established by the Engineering Accreditation Commission (EAC) of ABET.

(If this is a new course or if the "Method of instruction" box is checked above):



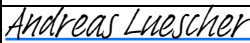
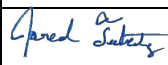
Maximum Class Size _____ Grading method: ☐ A/F ☐ S/U only ☐ A/B/C/NC (No Credit) ☐ S/NC (No Credit)

Method(s) of Instruction* _____ and contact hours _____

*See page two for Methods of Instruction definitions and approved combinations

What other colleges or departments/programs may be affected by this proposal?*** _____

**Please attach comments from affected units and circulate them with the curriculum modification request.

	Position	Name (print or type)	Signature	Date
1	Proposer Tel: 419- 3727507 Position: Professor	Sri Kolla	 S. R. Kolla (Apr 22, 2022 13:24 EDT)	
ADEQUATE LIBRARY MATERIALS ARE AVAILABLE (For NEW COURSE or NEW PROGRAM only):				
2	Dean, University Libraries	Sara A. Bushong		
APPROVED:				
3	Chair or School/Program Director	MD. Sarder		
4	Chair, College/School Curriculum Committee	Andreas Luescher	 Andreas Luescher (May 23, 2022 17:21 EDT)	
5	Dean of College	Jennie Gallimore		
6	Secretary, UGC (major changes only)	Sarah Meussling		
ACTIONS OF UNDERGRADUATE COUNCIL ARE REVIEWED BY THE FACULTY SENATE COMMITTEE ON ACADEMIC AFFAIRS (CAA).			Materials sent to CAA on:	
7	Provost/VPAA	Glenn Davis		
REVIEWED AND IMPLEMENTED BY:				
8	Registrar	Becky Cogswell		

SUBMITTING CURRICULUM MODIFICATION REQUESTS

A complete curriculum modification request includes a cover (blue) sheet and responses to either the “Course Change Request Form” or the “Program Change Request Form,” as appropriate (<http://www.bgsu.edu/provost/undergraduate-education/curriculum-modification-blue-sheets.html>).

The type of change will determine the way the proposal will be routed for approval. Changes that have minimal impact on other programs or on student requirements do not require review by the Undergraduate Council. For instance, “Minor changes to program requirements/checksheet” are those, such as small changes to the list of courses required for a major that have little or no effect on other academic units or on students’ likely academic progress. Please NOTE: The creation of a new course is a “Course Change,” but the addition of a course to program requirements is a “Program Change” requiring a separate blue sheet – neither change requires review by Undergraduate Council.

Any change that has a substantial impact on programs or students will require Undergraduate Council approval. For instance, “Major changes to program requirements/checksheet” are those that involve extensive new patterns of requirements for existing majors and minors (including entrance requirements from pre-major programs), or that have a significant impact on other departments’ programs / student requirements. Similarly, if a course change has wide impact on students in other programs, it will be reviewed by Undergraduate Council. Proposals for new degrees should be prepared in consultation with the office of the Provost/VPAA; they require approval by the Board of Trustees and the Ohio Department of Higher Education (formerly known as the Ohio Board of Regents). The Department of Higher Education new program/degree guidelines are available in the office of the Provost/VPAA. Program changes that include contractual arrangements with other institutions must be reviewed by University Counsel prior to signing. They also require Provost/VPAA approval and may require approval by the Board of Trustees.

CATALOG DESCRIPTION for a new or modified course, OR BRIEF OVERVIEW of other change:

1. **For requests to introduce or modify a course**, type the new description of the course (limit, 675 characters) exactly as it should appear in the Undergraduate Catalog, including course number, title, credit hours, semesters offered, description, and prerequisites. Indicate contact hours per week associated with primary methods of instruction (e.g., **LE**(2), **LB**(3)) – see table for brief definitions and approved combinations), class size, and grading method.
2. **For all other requests**, provide an identifying title for the proposal and a succinct description of the proposed change.

CHECKPOINT PROCEDURES

1. All proposals are circulated to the college offices for review (see #3, below). Anticipating that review, the person initiating the proposal should identify any academic units that may have a specific interest in the proposal. During review, the college offices are expected to attach comments from the identified units (and other units, as appropriate). The proposer may speed the process by soliciting comments prior to review by the colleges.
2. The Dean of University Libraries must certify that adequate library materials are available for any new course or new program. This may be a time-consuming step, so the proposer is encouraged to begin work with the library while the proposal is in draft form. Following library review and approval by the department chair or school/program director the proposal is forwarded to the dean for transmittal to the college curriculum committee.
3. Following review and approval by the curriculum committee and the Dean, the original and any supplemental statements should be submitted to the Office of the Provost/VPAA. All proposals will be circulated to the other colleges by the Secretary of Undergraduate Council. If no objection is raised within 14 days, proposals not requiring review by Undergraduate Council will be transmitted to the Provost/VPAA for approval. All other proposals will be forwarded to Undergraduate Council.

Methods of Instruction (defined by OBR)

Contact the BGSU Registrar for full descriptions.

LE	Lecture	DI	Discussion
SE	Seminar	RE	Recitation
LB	Lab	CL	Clinical
PR	Practicum	FE	Field Experience
ST	Studio	IS	Individual Studies
TU	Tutorial	SP	Self-Paced
OT	Other		

Web-centric: Course requires at least one class meeting, but web materials will be used to substitute for at least half of the regularly scheduled class meetings. Extensive use of the web will be required.

Web-based: 100% online course – students do not meet in a traditional classroom setting.

Approved Combinations

LE/LB	Lecture/ Lab	SE/FE	Seminar/ Field Experience
DI/RE	Discussion/ Recitation	TU/SP	Tutorial/ Self-Paced
LE/RE	Lecture/ Recitation	LE/LB	Lecture/Lab/ Recitation
LE/RE/PR	Lecture/Recitation/Practicum		

Modifications to courses cross-listed as graduate courses should be processed simultaneously through the Graduate College.

PROGRAM CHANGE REQUEST FORM

This sheet is an overview of the content and format of proposals for a new undergraduate program, or for elimination or modification of an existing program. Most program changes must be reviewed by Undergraduate Council and, in some cases, by the Board of Trustees and/or the Ohio Board of Regents. As a result, a proposal for program changes should generally be prepared in consultation with the Office of the Senior Vice President for Academic Affairs and Provost. Some of the information in the proposal must be summarized on the COURSE/CURRICULUM MODIFICATION REQUEST cover sheet ("blue sheet") that will accompany it through the approval process. *Depending on the nature of the request, it may not be necessary to provide all the information below. Please use your own responses to the checkbox items on the "blue sheet" as a guide for deciding which items below are relevant to your proposal.* Please use the outline headings shown below to prepare your document; omit any that do not apply.

A. THE MODIFICATION

1. *For all proposals:* Describe briefly the nature of the proposed change.

As part of an upcoming restructuring, the College of Technology, Architecture, and Applied Engineering has been approved to develop a School of Engineering that supports the university's strategic plan, FORWARD. The College currently houses one undergraduate engineering program, Systems Engineering, and is working to transition existing engineering technology programs into engineering programs. The proposed change is to transition the current B.S in Electronics and Computer Engineering Technology program into a B.S. in Electronics and Computer Engineering. The transition from engineering technology to engineering requires changes that include renaming the program, updating course content, adding new courses, renaming courses, and adapting existing program learning outcomes to meet standards established by the Engineering Accreditation Commission (EAC) of ABET.

The curriculum modification process is intended to change program requirements as represented in the Undergraduate Catalog and on checksheets. For this reason, all curriculum modifications for new programs or program revisions must include:

- 1.1 A checksheet that shows and highlights the proposed change(s). (Please make the *changes* on the checksheet *obvious*, preferable with revision markings).
- 1.2 Catalog pages (printed from the current version of the online catalog) showing the proposed changes. (Please use revision markings or some other device to make *changes obvious*). If a new program is being proposed, then new catalog copy should be submitted. Care should be taken to ensure that the proposed changes to the catalog match the proposed changes to the checksheet.
2. List courses to be taken out of program requirements. (If courses are to be eliminated from course inventory, submit a separate "course change" for that action).
N/A.
3. List courses to be added to program requirements. (If new courses are to be added to course inventory, submit a separate "course change" for that action).
See the attached check sheet for the list of the course.
4. *For proposals to make major changes to program requirements:* Describe any change to the sequence of courses within a major/minor/area of specialization/certificate.
See the attached degree plan for the sequence of courses.
5. Will this change result in modification of student learning outcomes? ☒ yes ☐ no
If yes, list all changes to the student learning outcomes related to the curriculum modification and describe the plan for assessing those outcomes.
This program is intended to be accredited by ABET, and the following are expected ABET student outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics, appropriate to the discipline of **Electronics and Computer Engineering.**
2. an 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, appropriate to the discipline of **Electronics and Computer Engineering.**
3. an ability to communicate effectively with a range of audiences.
4. an 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, appropriate to the discipline of **Electronics and Computer Engineering.**
5. an 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.
6. an ability to develop and conduct appropriate experimentation, using skills appropriate to the discipline of **Electronics and Computer Engineering** and to analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

These outcomes will be assessed through a list of proposed new courses. See the courses syllabi for the assessment details.

6. Program changes approved before the January deadline for the Catalog update will be recorded in the Catalog and will be in effect for checksheets in the fall of that year.

B. RATIONALE [Required for all proposals]:

1. Reason/Need for the change. For new programs, explain how this fits with the Academic Plan.

This is a transition from Electronics & Computer Engineering Technology to Electronics and Computer Engineering. This supports the University's Strategic Plan FORWARD to impact the regional, state, and national needs of engineers to support product development, manufacturing, and logistics. This also supports/aligns our programs to the newly approved College structure with the creation of the School of Engineering.

2. Student implications (describe the basis for each estimate)

- 2.1 Prospective demand for a new degree/major/minor (level of student interest).

It is anticipated that there is good demand for the engineering degree programs. A market analysis has been conducted and is included with the proposal.

- 2.2 Effect on required hours in degree/major/minor.

Program maintains the 122 units required for a Bachelor's Degree at BGSU.

- 2.3 Number of students affected and in what way.

Existing students will not be affected.

- 2.4 Effect on elective hours of majors/minors.

N/A

- 2.5 If a degree/major/minor is to be eliminated, how will current students in the program be accommodated?

N/A

- 2.6 If requirements for matriculation from a pre-major program are to be added or modified, how will those changes affect student enrollment and progress toward graduation?

N/A

- 2.7 Is this a degree program whose normal time to degree is something other than four calendar years for a baccalaureate degree and two calendar years for an associate degree? If so, how many hours/years to obtain the degree?
This degree program can be completed in four years; see the attached degree plan.

C. IMPLICATIONS FOR EXISTING PROGRAMS *[For all proposals]:*

1. How will the proposed change affect the integrity of other programs to which it is related, including the demand for courses or degrees in other programs
 - 1.1 in the department/school?
It is anticipated that the originating technology degree program, BS-ECET, enrollment will decrease and may be phased out as the demand and enrollment in this engineering program increases.
 - 1.2 in the college?
Course enrollments will shift from current technology courses to those of engineering courses as new programs roll out
 - 1.3 in other university departments/colleges?
Demand for some MATH and Science courses may increase – communication has occurred and documented.
 - 1.4 at other universities?
2. What individuals in other departments/schools/colleges, if any, have been consulted about this proposal? *[attach correspondence where appropriate]*
Math and Science Departments in the College of A&S.
3. What effect will the proposed change have on accreditation of this program or of associated programs in the college/university?
This program is intended to be accredited by the Engineering Accreditation Council (EAC) of ABET.
4. What effect will the proposed change have on the ability of the department/school/college/university to meet goals for recruitment, retention, and diversity?
The enrollment in this engineering degree program is anticipated to be higher than the present technology degree program allowing for recruitment of more students.

D. STAFFING IMPLICATIONS/QUALIFICATIONS

1. *For new programs, or if an existing degree/major/minor/area of specialization is to be modified:*
Are faculty and staff with expertise available now? ☒ yes ☐ no
If not, how will they be identified/recruited?
2. *For all proposals:* How will this change affect the allocation of faculty and staff in the department/school/college? **N/A**
3. *For all proposals:* How will this change affect faculty work load? **N/A**

E. AVAILABILITY OF RESOURCES

1. *For all proposals:* Indicate any unique space requirements for new or modified curricula, and space likely to be released by the elimination or modification of existing curricula, and space likely to be released by the elimination or modification of existing curricula.
N/A

2. *For all proposals:* Indicate any new one-time or continuing costs for materials, equipment, services, or personnel directly associated with a new or modified curriculum. How will these costs be covered? Indicate any cost savings to be generated if an existing degree/major/minor/area of specialization is to be eliminated.

N/A

3. *For all programs, or if an existing degree/major/minor/area of specialization to be modified:* Indicate any unique library, computer, or instructional media resources that will be needed for new or modified curricula. Are they already available?

IEEE Journal access needed

Software Needs are already in place through ITS/BGSU (e.g., MATLAB, simulation software)

F. TIMETABLE FOR IMPLEMENTATION [For all proposals]

1. Provide a detailed timetable for events that will occur as the proposed program change is accomplished (e.g. addition or elimination of courses, hiring of faculty).

Pending overall approval – implementation will be intentional to allow for recent students to enter transitioned program should they choose and then have new students enter as they initially enroll at BGSU. Students in existing engineering technology program will be supported fully to complete in progress degree program.

G. OTHER INFORMATION

1. Provide other information that may be helpful in the review process, as appropriate.

See the attached documents:

1. check sheet

2. degree plan

3. blue sheets and supporting documents for all modified/new courses.

4. ABET student outcomes.

ECE Program – ABET Outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics, appropriate to the discipline of Electronics and Computer Engineering.
2. an 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, appropriate to the discipline of Electronics and Computer Engineering.
3. an ability to communicate effectively with a range of audiences.
4. an 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, appropriate to the discipline of Electronics and Computer Engineering.
5. an 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.
6. an ability to develop and conduct appropriate experimentation, using skills appropriate to the discipline of Electronics and Computer Engineering and to analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

FW: Request to Add/remove Math courses

MD Baniamin Sarder <msarder@bgsu.edu>

Wed 4/13/2022 1:46 PM

To: Mohammad A Mayyas <mmayyas@bgsu.edu>; Mikhail Shilov <mshilov@bgsu.edu>; Sri R Kolla <skolla@bgsu.edu>
FYI.

From: Junfeng Shang <jshang@bgsu.edu>
Sent: Wednesday, April 13, 2022 10:45 AM
To: MD Baniamin Sarder <msarder@bgsu.edu>
Subject: Re: Request to Add/remove Math courses

Hi MD,

Yes, our math department will be supportive to your programs on the request to add/remove math courses.

To support this request, we need to plan early. Specifically, we need to create 3 more sections of Math 2320 for your three programs. Can you please let us know ahead of time about when the students in your program will take Math 2320? Then we can hire one faculty member to teach these 3 sections.

From current point, what is the beginning year that we need to create the sections of Math 2320 for your students?

Thanks,
Junfeng

Junfeng Shang

Professor and Chair

458 MSC | 419-372-7453

jshang@bgsu.edu



From: MD Baniamin Sarder <msarder@bgsu.edu>
Sent: Tuesday, April 12, 2022 5:03 PM
To: Junfeng Shang <jshang@bgsu.edu>
Subject: RE: Request to Add/remove Math courses

Hi Junfeng,

Hope you are doing great. You may have heard that we are creating a new school of engineering, and hence we are transitioning our technology programs (ECET, MMET, MET) into engineering programs (ECE, MME, and Robotics). We are planning to use those higher level mathematics for all of our engineering courses. Each of the program will have a similar demand of 20-25 students. You already

responded "Yes" to Mohammad and Mikhail, but I wanted to make sure before we move forward with the blue sheets.

Have a great day.

Best Regards,

MD

.....

MD B. Sarder, Ph.D.

Professor and Chair



Email: msarder@bgsu.edu

Office: 419-372-6085; Fax: 419-372-7570

From: Junfeng Shang <jshang@bgsu.edu>

Sent: Wednesday, March 16, 2022 3:19 PM

To: Mohammad A Mayyas <mmayyas@bgsu.edu>

Cc: Mohammed Ibrahim Kmal Abouheaf <mabouhe@bgsu.edu>; Resmi Krishnankuttyrema <resmik@bgsu.edu>;

MD Baniamin Sarder <msarder@bgsu.edu>; Linda Leimgruber <lleimgr@bgsu.edu>; Jennie Gallimore <jgallim@bgsu.edu>

Subject: Re: Request to Add/remove Math courses

Hi Mohammad,

We discussed your request in our departmental advisory committee meeting today.

Yes, Math department is fine with adding Math 2320 (Calculus II) in the requirements of the Methatronics Engineering Technology program. This addition is very reasonable for this program.

Math department is also fine with the removal of Math 1280 for the requirements in the Methatronics Engineering Technology program. But Math department also understands that Math 1280 is an important prerequisite for Math 1310 (or 1340 and 1350), and this prerequisite is not changed. Your students can pass any type of placement test or Math 1280 to take Calculus courses (Math 1310-2320).

In summary, Math department supports this request for adding Math 2320 and removing Math 1280 in the Methatronics Engineering Technology program.

In addition, please let me know how many of your students will take Math 2320 and when this starts so that we can create sections of Math 2320 for your students.

Thanks,
Junfeng

Junfeng Shang

Professor and Chair

458 MSC | 419-372-7453

FW: Request to add/remove Phys. courses

MD Baniamin Sarder <msarder@bgsu.edu>

Tue 4/12/2022 2:46 PM

To: Mohammad A Mayyas <mmayyas@bgsu.edu>; Sri R Kolla <skolla@bgsu.edu>; Mikhail Shilov <mshilov@bgsu.edu>
FYI.

From: Andrew Layden <laydena@bgsu.edu>**Sent:** Tuesday, April 12, 2022 2:23 PM**To:** MD Baniamin Sarder <msarder@bgsu.edu>**Subject:** Re: Request to add/remove Phys. courses

Hi MD,

Yes, we will find a way to support your engineering programs. This may require reallocating teaching resources (lab/TAs and recitation sections) between existing sections, or increasing them if the net enrollment increases. But we are committed to supporting engineering.

Best wishes as you develop these programs,
-Andy

Chair, Dept. of Physics & Astronomy

104C Overman Hall

Bowling Green State University

419-372-8653 || [Webpage](#)

[he/him/his]

From: MD Baniamin Sarder <msarder@bgsu.edu>**Sent:** Tuesday, April 12, 2022 2:00 PM**To:** Andrew Layden <laydena@bgsu.edu>**Subject:** RE: Request to add/remove Phys. courses

Hi Andy,

Hope you are doing great. You may have heard that we are creating a new school of engineering, and hence we are transitioning our technology programs (ECET, MMET, MET) into engineering programs (ECE, MME, and Robotics). All of our engineering programs will need PHYS 2110 and 2120 instead of PHYS 2010 and 2020. You already responded "Yes" to Mohammad, but I wanted to make sure before we move forward with the blue sheets.

Have a great day.

Best Regards,

MD

.....

MD B. Sarder, Ph.D.

Professor and Chair

May 2, 2022

To: Sri Kolla, Professor, Engineering Technologies
MD Baniamin Sarder, Chair, Engineering Technologies

From: JK Jake Lee, Chair, Department of Computer Science

RE: Letter of Support for Inclusion of Four CS courses in the proposed Electronics and Computer Engineering (ECE) requirement

This will serve as a letter of support from the Department of Computer Science (CS) regarding the proposed Electronics and Computer Engineering (ECE) curriculum- i.e., to include/keep CS 1010, 2010, 2020, and 2190 as a required degree requirement.

Unless the enrollments in ECE changes significantly, this change will not impact our CS course offering.

Regards,



JK Jake Lee

Associate Professor and Chair
Department of Computer Science
Bowling Green State University
Email: leej@bgsu.edu
Office: 419-372-2407

BG PERSPECTIVE (BGP) REQUIREMENTS:

Course _____ Credits _____

Must complete at least 1 course in each of the following:

English Composition and Oral Communication _____

Quantitative Literacy _____

Must complete at least 2 courses in each of the following:

Humanities and the Arts _____

Natural Sciences - at least one Lab Science required _____

Social and Behavioral Sciences _____

Complete total required BGP credit hours by selecting courses from any of the above categories:**UNIVERSITY REQUIREMENTS**

Note: Designated courses in the Humanities and the Arts, and the Social and Behavioral Sciences domains may be used to fulfill both a BGP requirement and one of the following university requirements:

Cultural Diversity in the U.S. _____

International Perspective _____

Composition Requirement:

_____ WRIT 1120 Research Writing _____

Total BGP Credits: Must be at least 36

** These courses may be used to meet BG Perspective requirements, but hours are counted only once.

See the Undergraduate Catalog

+ ECET 1960 must be taken before TECH 2890, and must receive a grade of C or higher.

- Matriculation courses are shown in **BOLD PRINT**.

NOTES:

- Due to the cooperative education requirement, in order to complete this program in four years, it is necessary for the student to either enroll in co-op hours or coursework during the summer as well as during the academic year. If a student is not able to do so, this program will take five years to complete.

Courses Required for Major**Cooperative Education****2 Hrs**_____ **TECH 2890 Co-op** **1**_____ **TECH 3890 Co-op** **1****Concentration****51 Hrs**_____ **ECET 1960 Electrical-Electr Sys+** **3**_____ ECET 2050 Renewable Energy **3**_____ **ECET 2400 Electric Circuits** **3**_____ **ECET 2410 Electronic Circuits** **3**_____ **ECET 2490 Dig Elec Comp Sys** **3**_____ ECET 3000 Elec Mach Ctrl **3**_____ ECET 3100 Program Logic Ctrl **3**_____ ECET 3410 Electronic Devices **3**_____ ECET 3440 Comm Circuits **3**_____ ECET 3490 Digital Comp Analysis **3**_____ ECET 3860 Dig Comm Networks I **3**_____ ECET 4410 Instrumentation **3**_____ ECET 4450 Wireless Commun Systems **3**_____ ECET 4530 Digital Comm Ctrl **3**_____ ECET 4860 Dig Comm Networks II **3**_____ ECET 4950 Senior Capstone **3**_____ **ENGT 1100 CAD** **3****Technology Electives****9 Hrs**_____ CS 2020 Objects and Data Abst **3**_____ CS 2190 Computer Organization **3**_____ ECET 3570 Electric Power Trans **3**_____ ECET 4800 Topics in ECET **3**_____ TECH 4890 Co-op **1**_____ ECET 4900 Problems in ECET **3**_____ Choose ENGT or ROBO course **3****Other Required Courses****University****35-36 Hrs**_____ **CS 1010** **3**_____ CS 2010 **3**_____ **MATH 1280**** **5**_____ **PHYS 2010**** **5**_____ PHYS 2020** **5**_____ MATH 1310**or 1340**+1350 **5-6**_____ COMM 3060 **3**_____ STAT 2000** **3**_____ TECH 3020 **3****Business (Select)****9 Hrs**_____ MKT 3000 (prereq ECON 2000**) **3**_____ MKT 4420 **3**_____ ACCT 2000 **3**_____ MGMT 3000 (prereq STAT 2120) **3**_____ MGMT 3050 or MGMT 3600 **3**_____ LEGS 3010 **3**_____ QS 3550 **3****Total Minimum Program Hours****122**

Important information on the back.

Electronics and Computer Engineering

BG PERSPECTIVE (BGP) REQUIREMENTS:

Course _____ Credits _____
Must complete at least 1 course in each of the following:
 English Composition and Oral Communication _____

Quantitative Literacy _____

Must complete at least 2 courses in each of the following:

Humanities and the Arts _____

Natural Sciences _____

Social and Behavioral Sciences _____

Complete total required BGP credit hours by selecting courses from any of the above categories:

UNIVERSITY REQUIREMENTS

Note: Designated courses in the Humanities and the Arts, and the Social and Behavioral Sciences domains may be used to fulfill both a BGP requirement and one of the following university requirements:

Cultural Diversity in the U.S. _____
 International Perspective _____

Composition Requirement:
 WRIT 1120 Research Writing 3 _____

Total BGP Credits: Must be at least 36

** These courses may be used to meet BG Perspective requirements, but hours are counted only once.
 # See the Undergraduate Catalog.

NOTES:

- Due to the cooperative education requirement, in order to complete this program in four years, it is necessary for the student to either enroll in co-op hours or coursework during the summer as well as during the academic year. If a student is not able to do so, this program will take five years to complete.

Courses Required for Major

Cooperative Education **2 Hrs**
 _____ TECH 2890 Co-op 1
 _____ TECH 3890 Co-op 1

Concentration **48 Hrs**
 _____ ECE 1965 Intro to Electronics and Computer+ 3
 _____ ECE 2055 Renewable Energy and Sustainability 3
 _____ ECE 2405 Electric Circuits and Devices 3
 _____ ECE 2415 Analog Electronics 3
 _____ ECE 2495 Digital Logic Circuits 3
 _____ ECE 3005 Electric Machines and Drives 3
 _____ ECE 3105 Programmable Logic Controllers 3
 _____ ECE 3415 Electronic Devices and Integrated Cir+ 3
 _____ ECE 3445 Communication Systems 3
 _____ ECE 3495 Microprocessors and Embedded Syst+ 3
 _____ ECE 3535 Linear Control Systems 3
 _____ ECE 3865 Computer Communication Networks 3
 _____ ECE 4415 Instrumentation & Signal Processing 3
 _____ ECE 4455 Wireless and Mobile Systems 3
 _____ ECE 4865 Computer and Wireless Security 3
 _____ ECE 4955 Senior Capstone 3

Engineering Electives **9 Hrs**
 _____ ECE 3575 Power Systems and Smart Grid 3
 _____ ECE 4615 VLSI Design 3
 _____ ECE 4905 Problems in ECE 3
 _____ CS 2020 Intermediate Programming 3
 _____ CS 2190 Computer Organization 3
 _____ MME 2000 – or higher 3
 _____ ROBO 2080 – or higher 3
 _____ SYE 2010 – or higher 3
 _____ TECH 4890 Co-op 1

Other Required Courses

University **51-53 Hrs**
 _____ CS 1010 3
 _____ CS 2010 3
 _____ MME 1100 CAD 3
 _____ MATH 1310** or 1340**+1350** 5-6
 _____ MATH 2220 or MATH 3220 3
 _____ MATH 2320 5
 _____ MATH 2470 3
 _____ MATH 2910 3
 _____ PHYS 2110** 5
 _____ PHYS 2120** 5
 _____ CHEM 1090+1100** or CHEM 1230+1240** 4-5
 _____ or BIOL 1040**
 _____ COMM 1020** 3
 _____ ECON 2000** 3
 _____ TECH 3020** 3

Business (Select) **3 Hrs**
 _____ MKT 3000 (Prereq ECON 2000**) 3
 _____ MGMT 3000 3
 _____ MGMT 3050 or MGMT 3600 3
 _____ LEGS 3010 3

Total Minimum Program Hours **122**

College of Technology, Architecture and Applied Engineering

General Information for all students in the College

In addition to completing all requirements on the checklist, students are responsible for:

Co-op

All students in the College are required to complete 2 or 3 co-ops, depending on your major. THIS IS A COURSE. It carries credit and is graded. It is full time (40 hrs/week) for the entire semester or part-time (20 hrs/week) for two consecutive semesters, paid and must be directly related to your major. All students MUST complete the Co-op Orientation available in Canvas.

Email

Official University email accounts are required for all BGSU students. Official BGSU email addresses are in the form: BGSUusername@bgsu.edu. At the time of admission or initial registration, all students will receive a bgsu.edu email account. Students may anticipate that official University correspondence will be sent to this email account and they should access BGSU email on a regular and timely basis. All correspondence from Undergraduate Student Services will be sent to your BGSU email.

Checksheet

The checklist should be used in conjunction with the degree audit and advising to track progress toward degree completion.



College of Technology Architecture and Applied Engineering

B. S. in Electronics and Computer Engineering

Sample Grad Plan

Fall 2023

This is a sample grad plan for a student with incoming earned credit hour and places into WRIT 1120 and MATH 1310

Fall (Semester 1)		Spring (Semester 2)		Summer	
Course	Credits	Course	Credits	Course	Credits
ECE 1965 (Fall and Spring)	3	ECE 2495 or ECE 2055 (spring only)	3		
CS 1010	3	MME 1100 (Fall and Spring)	3		
BGP Humanities & Arts + Cultural Diversity	3	MATH 2320	5		
MATH 1310	5	CHEM 1090+1100	4		
WRIT 1120	3				
	17		15		0
Fall (Semester 3)		Spring (Semester 4)		Summer	
Course	Credits	Course	Credits	Course	Credits
ECE 2405 (fall only)	3	ECE 2055 or ECE 2495 (spring only)	3	TECH 2890	1
CS 2010	3	ECE 2415 (spring only)	3		
COMM 1020	3	BGP Humanities & Arts	3		
PHYS 2110	5	MATH 2470	3		
MATH 2910	3	PHYS 2120	5		
	17		17		1
Fall (Semester 5)		Spring (Semester 6)		Summer	
Course	Credits	Course	Credits	Course	Credits
ECE 3105 (fall only)	3	MATH 2220 or Business Elective	3	TECH 3890	1
ECE 3415 (fall only)	3	BGP Social & Behavioral Science (ECON 2000)	3		
ECE 3495 (fall only)	3	ECE 3005 (spring only)	3		
ECE 3865 (fall only)	3	ECE 3445 (spring only)	3		
Business Elective or MATH 2220	3	Engineering Elective or ECE 3535 (spring only)	3		
	15		15		1
Fall (Semester 7)		Spring (Semester 8)		Summer	
Course	Credits	Course	Credits	Course	Credits
Engineering Elective	3	Engineering Elective	3		
ECE 4415 (fall only)	3	ECE 4455 (spring only)	3		
ECE 4865 (fall only)	3	ECE 4955 (fall and spring)	3		
TECH 3020	3	ECE 3535 (spring only) or Engineering Elective	3		
	12		12		0

Total Credits Earned 122



An evaluation of employer demand for graduates from the proposed bachelor's-level electronics and computer engineering program in both regional and national markets, and student demand for similar programs.

Analysis Includes:

- Job Posting Trends
- Top Titles
- Top Skills
- Top Employers
- Top Industries
- Top Cities
- Experience Levels
- Education Levels
- Degree Completion Trends

The analysis considered demand in:

- Indiana, Michigan, Ohio, Pennsylvania
- The United States

Options for Next Steps

Following this analysis, the requesting partner can:

- Choose to discontinue the research, if the leadership is able to make a decision based on this analysis and other institutional research.
- Continue the analysis. A final report of the continued research will address credential design and curricular recommendations.

Despite Favorable Labor Markets and Increasing Student Demand, Strong Regional Competitors Could Challenge a New Program

Preliminary Program Outlook

Regional and national employer demand trends indicate strong and growing labor markets for bachelor's-level electronics and computer engineering professionals. In the past 12 months, employers advertised a high number of relevant job postings in both regions (i.e., 97,242 job postings regionally and 846,306 job postings nationally). Additionally, average monthly growth in employer demand for relevant professionals outpaced that of all bachelor's-level professionals in both regions between October 2019 and September 2022 (i.e., 1.56% vs. 1.11% regionally and 1.51% vs. 1.02% nationally). In both regions, employment in four of the top five most relevant occupations is projected to grow faster than average between 2022 and 2032. Together, these trends indicate a favorable labor market with increasing employment opportunities for program graduates.

Degree completion trends indicate student demand grew faster than competition. Between the 2015-2016 and 2019-2020 academic years, the number of relevant completions grew faster than the number of institutions reporting relevant completions in both regions (i.e., 5.68% vs. 1.92% on average annually regionally and 5.43% vs. 1.81% on average annually nationally), which could present an opportunity to capture student demand.

However, strong regional competitors could challenge new programs. In the 2019-2020 academic year, the top three institutions reporting relevant completions regionally held over 30% of the market share combined, indicating they are established competitors in the region. Additionally, the top reporting competitor regionally, The Ohio State University – Main Campus, was also the top reporting competitor in the nation in the 2019-2020 academic year. This indicates the institution has a strong program that could significantly challenge the proposed program in both markets.

No regional institutions and only 15 national institutions reported relevant completions with a 100% distance-delivery option in the 2019-2020 academic year. The limited number of distance-delivery programs in the country could present an opportunity for the proposed hybrid program to capture underserved interest for a more flexible modality, particularly in the region.

Research Limitations

Because institutions self-report data to the NCES, some comparable and competitor programs may have chosen to report completions for a bachelor's-level electronics and computer engineering program under an alternate CIP code and not be included in the analysis. Additionally, the aggregate of three electronics and computer engineering related CIP codes were used in the competitive landscape portion of this analysis, meaning the number of relevant completions reported per institution could represent multiple related programs within that institution, rather than electronics and computer engineering programs exclusively.

Regional Analysis of Job Postings for Bachelor's-Level Electronics And Computer Engineering Professionals

Regional job posting trends suggest a strong need for program graduates. In the past year, employers advertised a high number of relevant job postings (i.e., 97,242 job postings). Additionally, between October 2019 and September 2022, average monthly growth in employer demand for bachelor's-level electronics and computer engineering professionals outpaced that of all bachelor's-level professionals (i.e., 1.56% vs. 1.11%, respectively). Together, these trends indicate a stable and growing labor market.

+1.56%

Average Monthly Demand Growth

October 2019 - September 2022, Regional Data

- Average monthly growth of 244 postings.
- During the same period, demand for all bachelor's-level professionals grew 1.11%.

15,558 job postings

Average Monthly Demand

October 2019 - September 2022, Regional Data

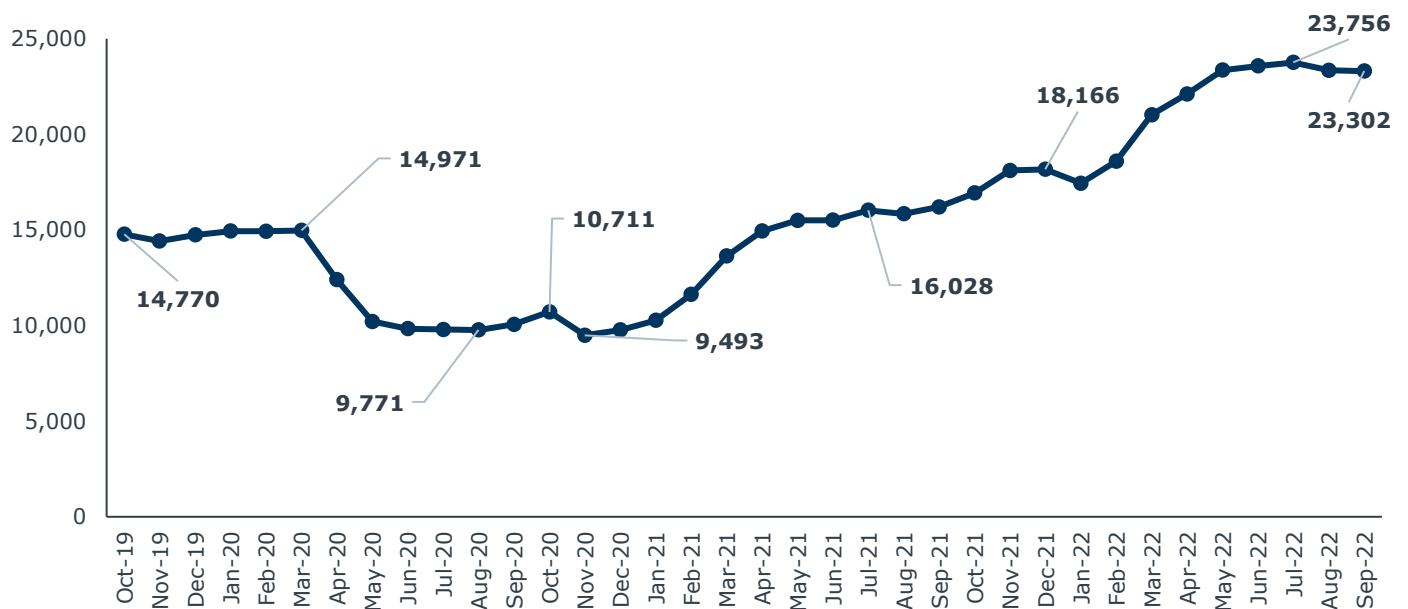
97,242 job postings

Relevant Jobs Posted in the Past Year

October 2021 - September 2022, Regional Data

Job Postings for Bachelor's-Level Electronics And Computer Engineering Professionals over Time

October 2019 - September 2022, Regional Data



Source: EAB analysis. Lightcast Analyst.

National Analysis of Job Postings for Bachelor's-Level Electronics And Computer Engineering Professionals

Similar to regional trends, national job posting trends indicate a favorable labor market for bachelor's-level electronics and computer engineering professionals. Employers advertised a high number of relevant job postings in the past year (i.e., 846,306 job postings). Additionally, average monthly growth in employer demand for relevant professionals (i.e., 1.51%) outpaced the average monthly growth in employer demand for all bachelor's-level professionals (i.e., 1.02%) between October 2019 and September 2022. These trends indicate a strong and growing labor market for program graduates in the United States.

+1.51%

Average Monthly Demand Growth

October 2019 - September 2022, National Data

- Average monthly growth of 2,192 postings.
- During the same period, demand for all bachelor's-level professionals grew 1.02%.

142,657 job postings

Average Monthly Demand

October 2019 - September 2022, National Data

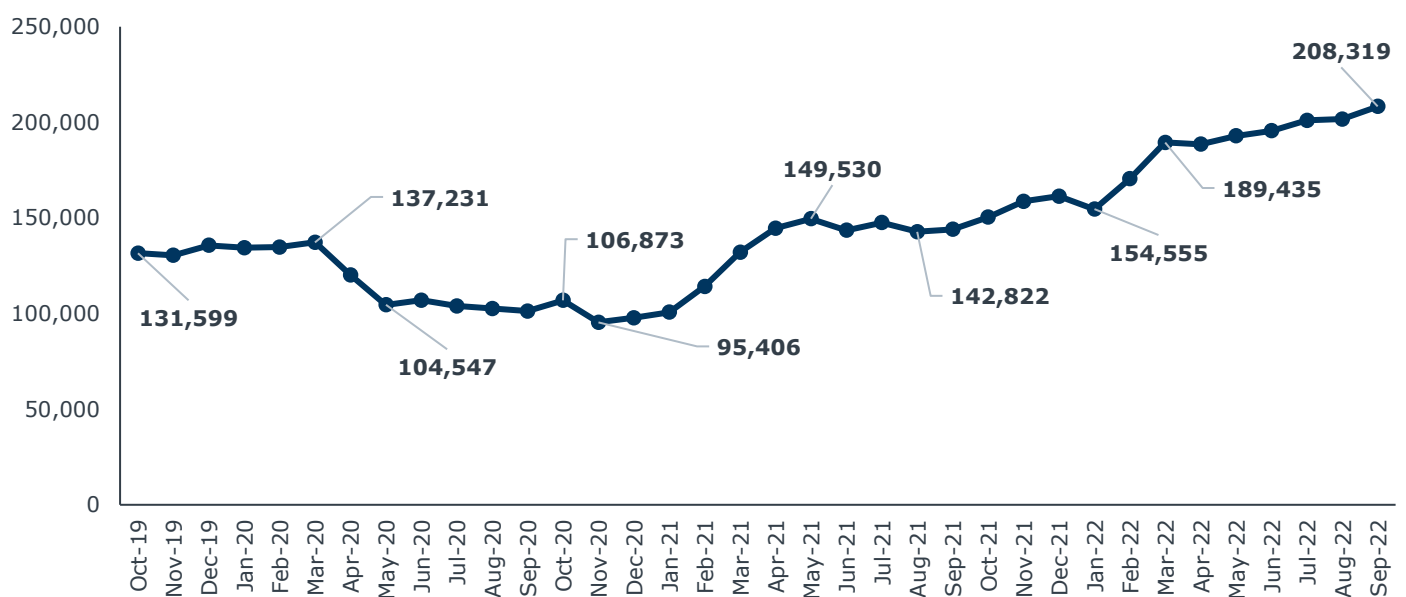
846,306 job postings

Relevant Jobs Posted in the Past Year

October 2021 - September 2022, National Data

Job Postings for Bachelor's-Level Electronics And Computer Engineering Professionals over Time

October 2019 - September 2022, National Data



Source: EAB analysis. Lightcast Analyst.

Analysis of Employment for Electronics And Computer Engineering Professionals

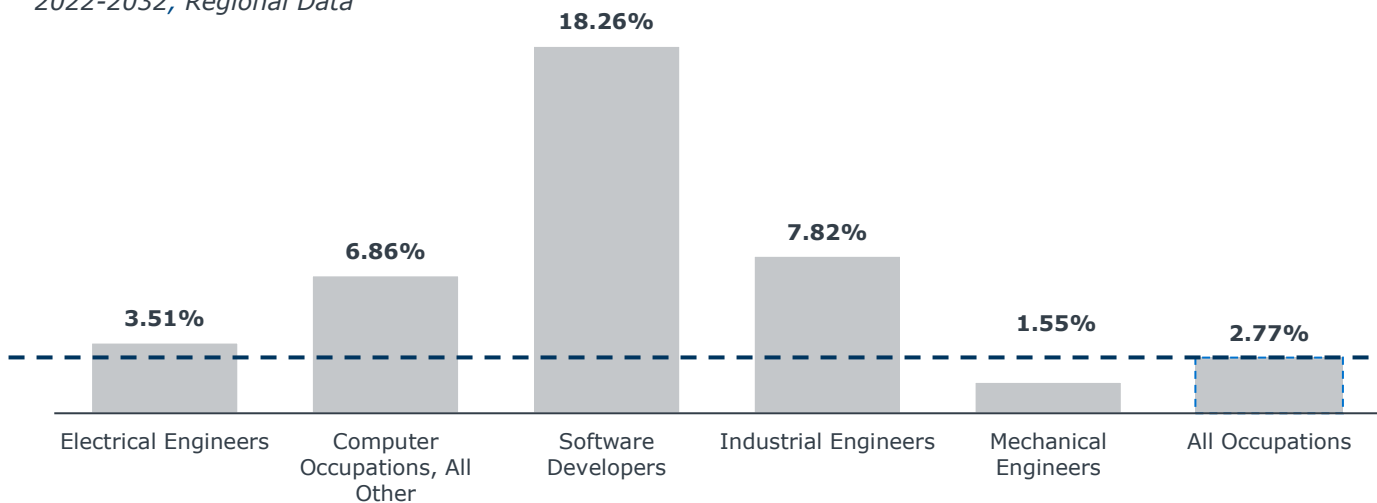
Regionally and nationally, employment in four of the top five most relevant occupations is projected to grow faster than average across the next 10 years. This indicates employment opportunities for relevant professionals will likely increase in both regions in the next decade.

The occupation "[Software Developers](#)" is projected to grow much faster than average in both regions. The Bureau of Labor Statistics indicates the increasing focus on computer security within corporations could contribute to this high projected growth. Relevant job postings in the region falling under this occupation include "Lead Electronics Engineers" and "FPGA Design Engineers."

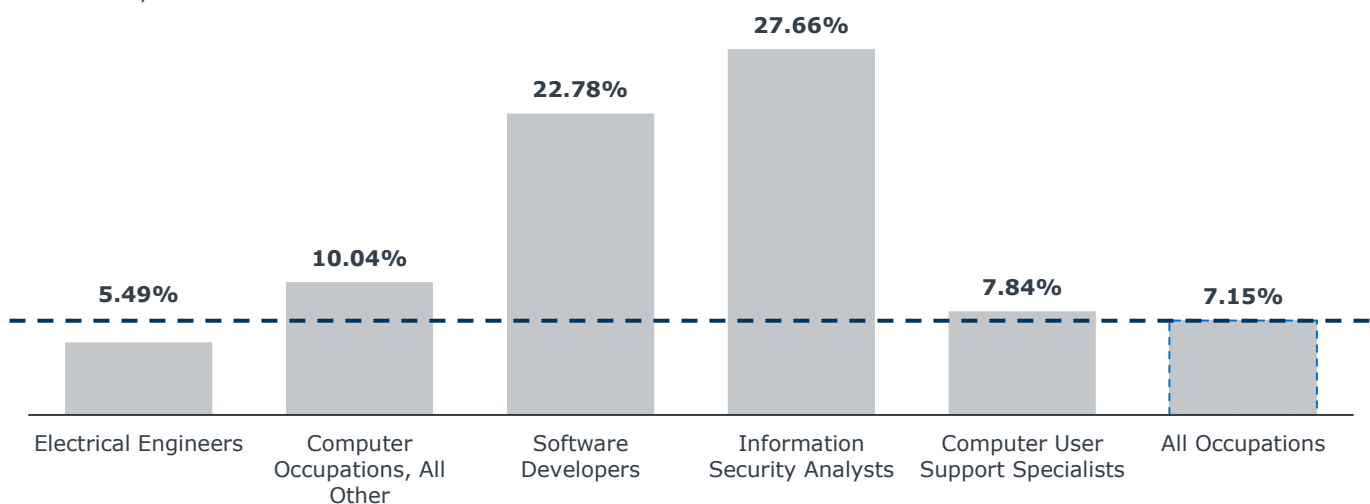
While these occupations represent the most common occupations appearing in job postings for bachelor's-level electronics and computer engineering professionals, the projected employment data considers all jobs within an occupation at all degree levels.

Projected Employment in Top Occupations¹

2022-2032, Regional Data



2022-2032, National Data



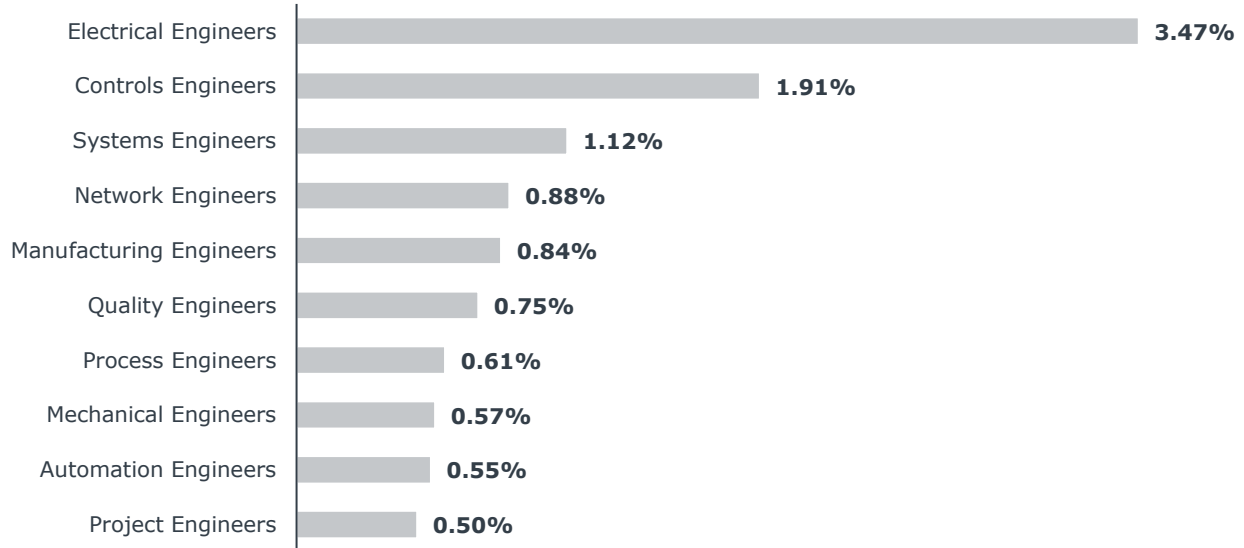
— — — The dashed blue line represents the projected employment growth across all occupations from 2022 to 2032.

1) Top occupations refer to the occupations in which employers most often seek relevant professionals.

Top Titles in Job Postings for Bachelor's-Level Electronics And Computer Engineering Professionals

October 2021 - September 2022, Regional Data

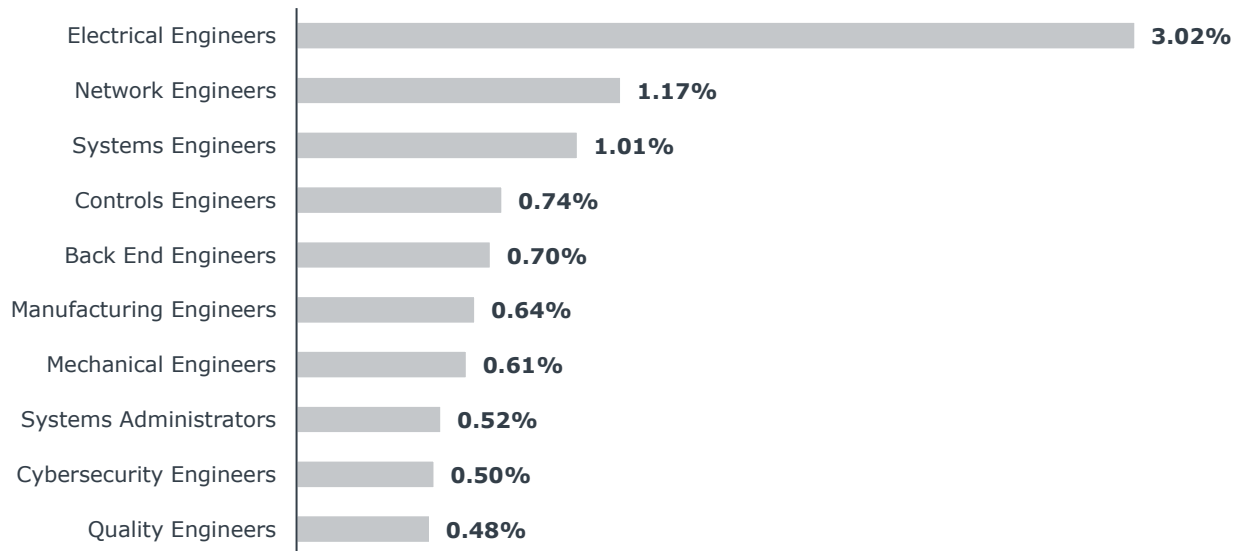
n = 97,242 job postings



Top Titles in Job Postings for Bachelor's-Level Electronics And Computer Engineering Professionals

October 2021 - September 2022, National Data

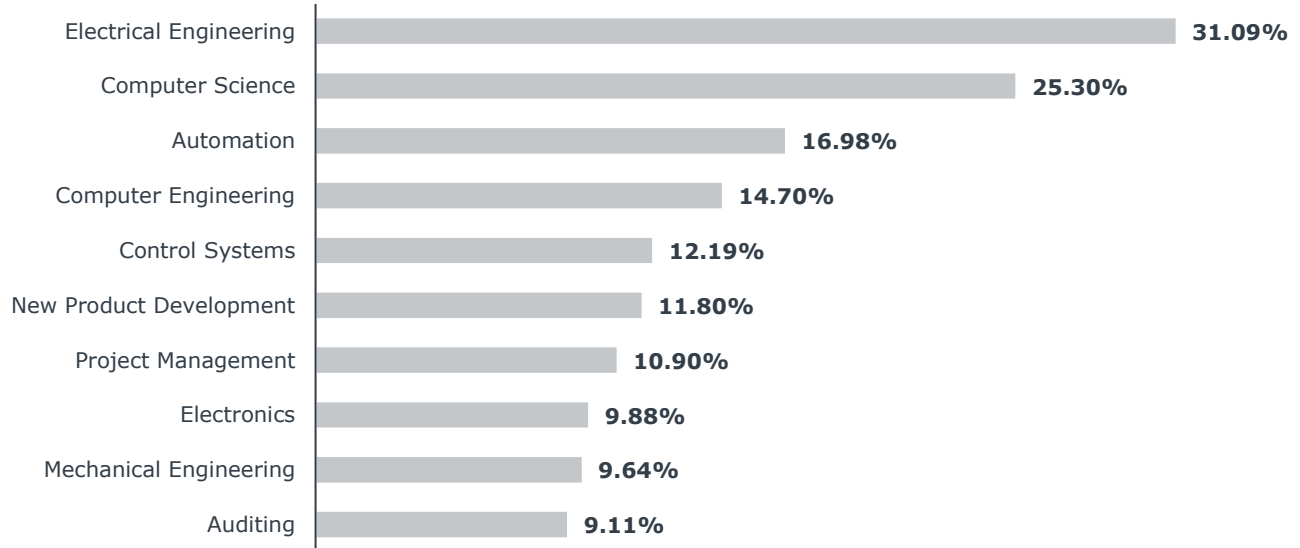
n = 846,306 job postings



Top Skills Requested of Bachelor's-Level Electronics And Computer Engineering Applicants

October 2021 - September 2022, Regional Data

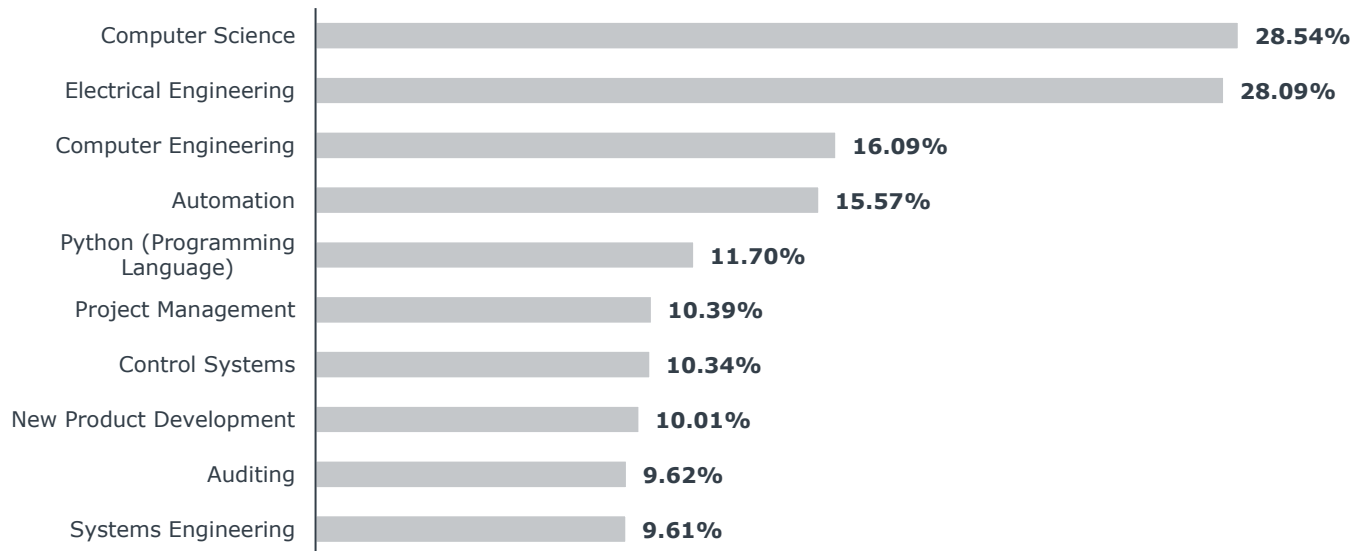
n = 97,242 job postings



Top Skills Requested of Bachelor's-Level Electronics And Computer Engineering Applicants

October 2021 - September 2022, National Data

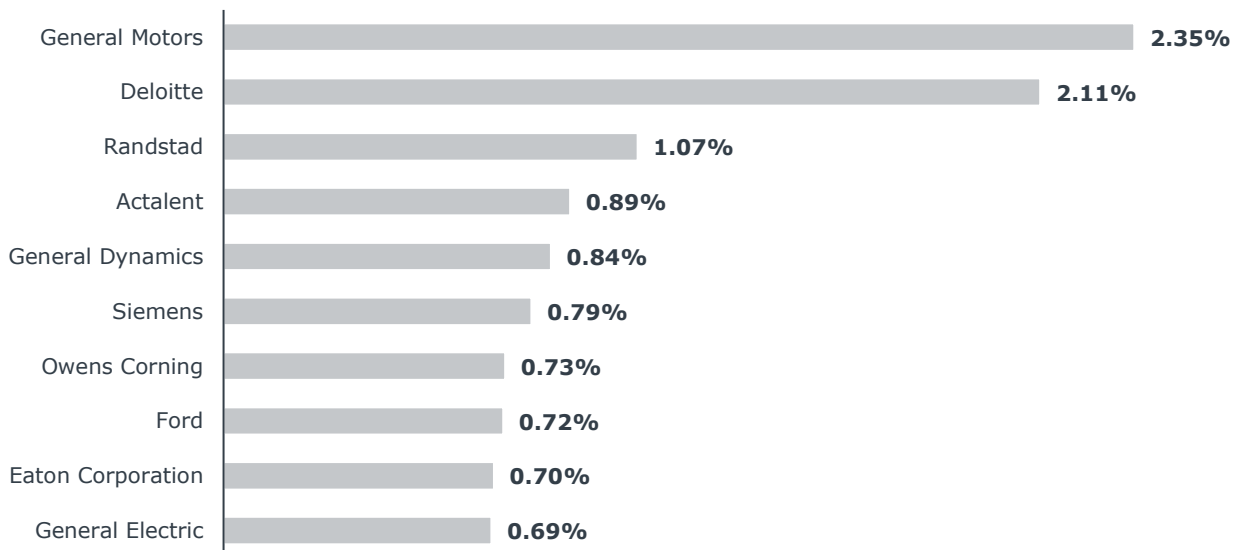
n = 846,306 job postings



Top Employers Seeking Bachelor's-Level Electronics And Computer Engineering Applicants

October 2021 - September 2022, Regional Data

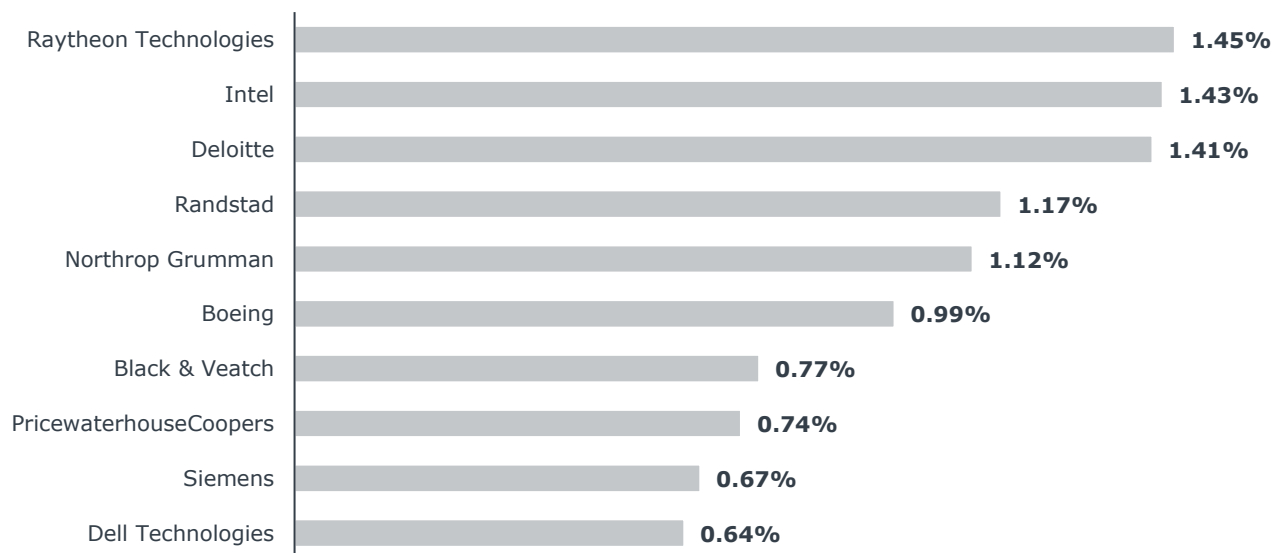
n = 97,242 job postings



Top Employers Seeking Bachelor's-Level Electronics And Computer Engineering Applicants

October 2021 - September 2022, National Data

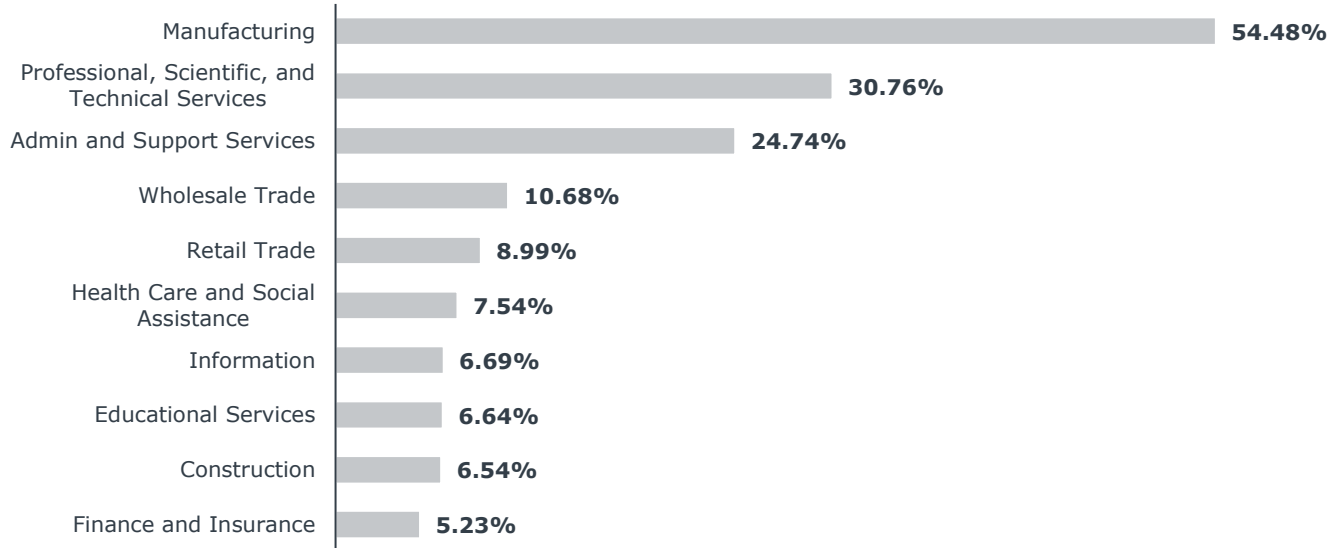
n = 846,306 job postings



Top Industries Advertising Bachelor's-Level Electronics And Computer Engineering Job Postings

October 2021 - September 2022, Regional Data

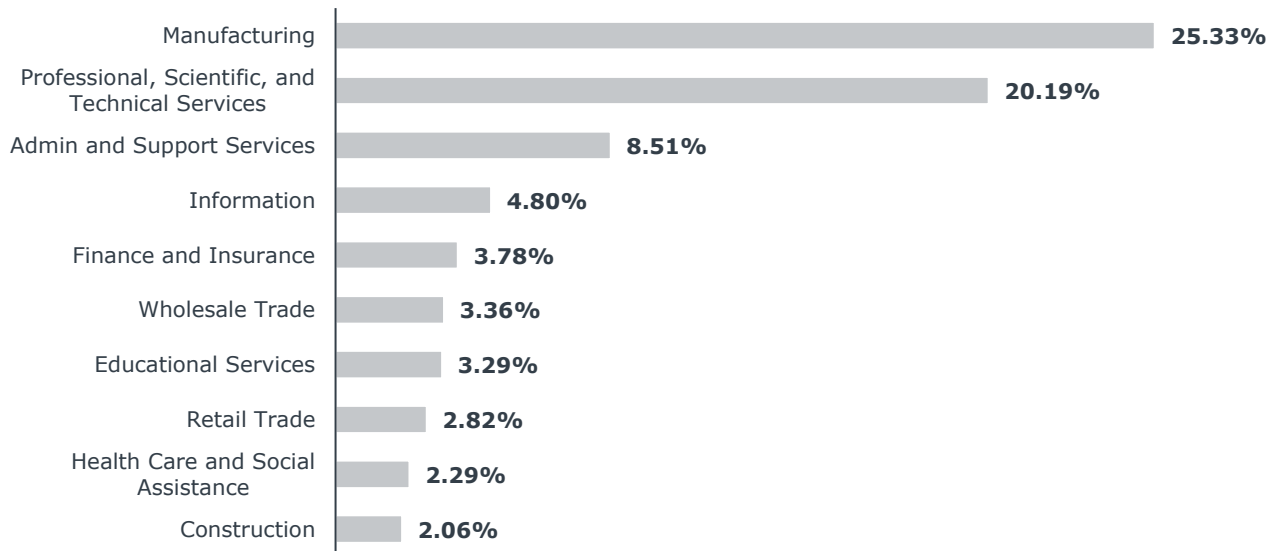
n = 97,242 job postings



Top Industries Advertising Bachelor's-Level Electronics And Computer Engineering Job Postings

October 2021 - September 2022, National Data

n = 846,306 job postings



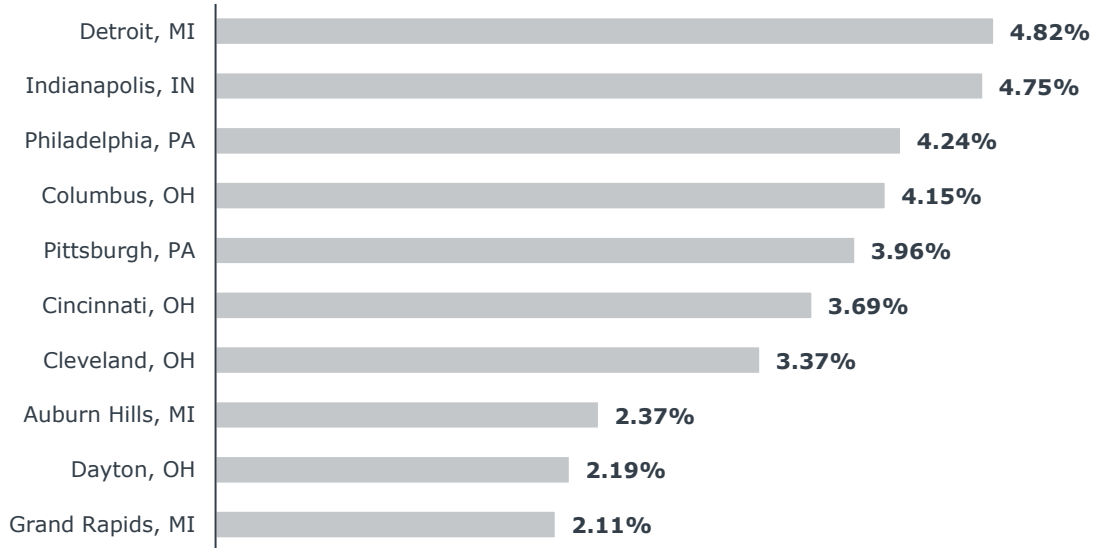
Label abbreviations:
"Admin and Support Services" -
Administrative and Support and Waste
Management and Remediation Services

Lightcast Analyst often classifies job postings from staffing companies under the category "Administrative and Support and Waste Management and Remediation Services."

Top Cities Seeking Bachelor's-Level Electronics And Computer Engineering Applicants

October 2021 - September 2022, Regional Data

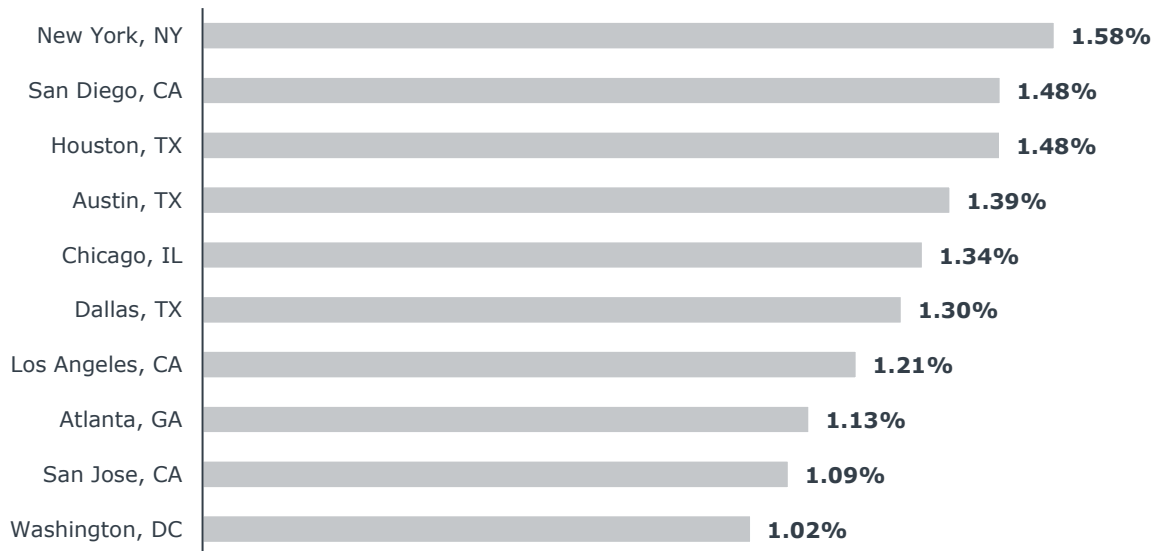
n = 97,242 job postings



Top Cities Seeking Bachelor's-Level Electronics And Computer Engineering Applicants

October 2021 - September 2022, National Data

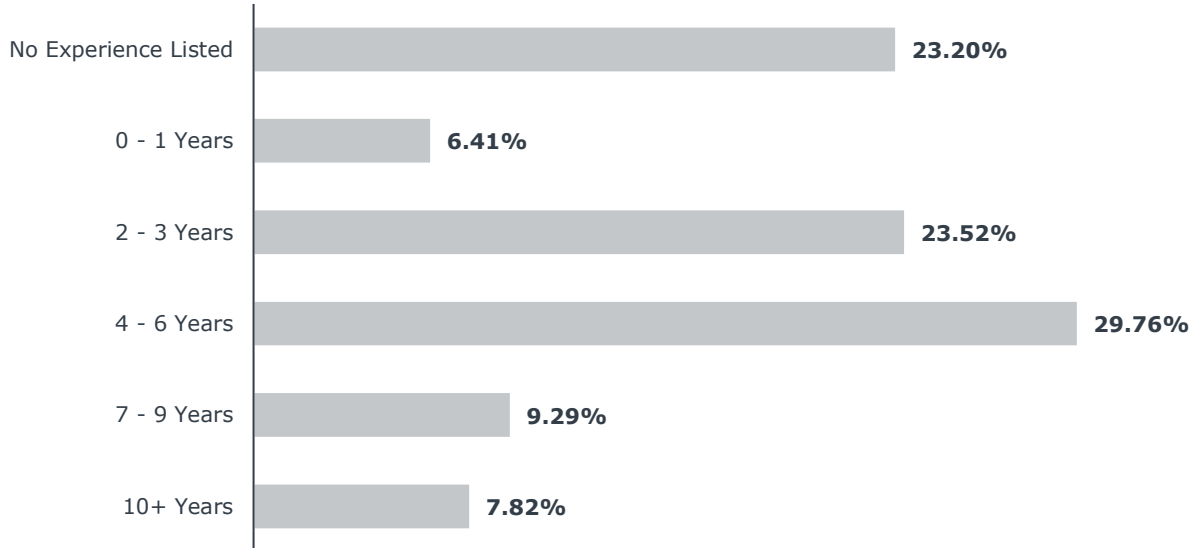
n = 846,306 job postings



Experience Levels Requested of Bachelor's-Level Electronics And Computer Engineering Applicants

October 2021 - September 2022, Regional Data

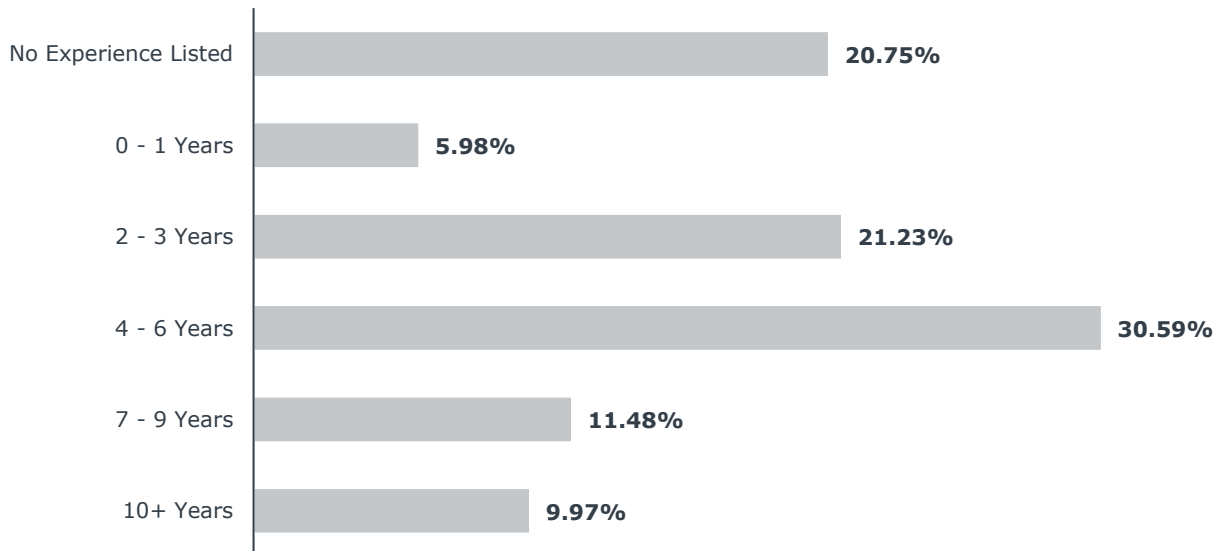
n = 97,242 job postings



Experience Levels Requested of Bachelor's-Level Electronics And Computer Engineering Applicants

October 2021 - September 2022, National Data

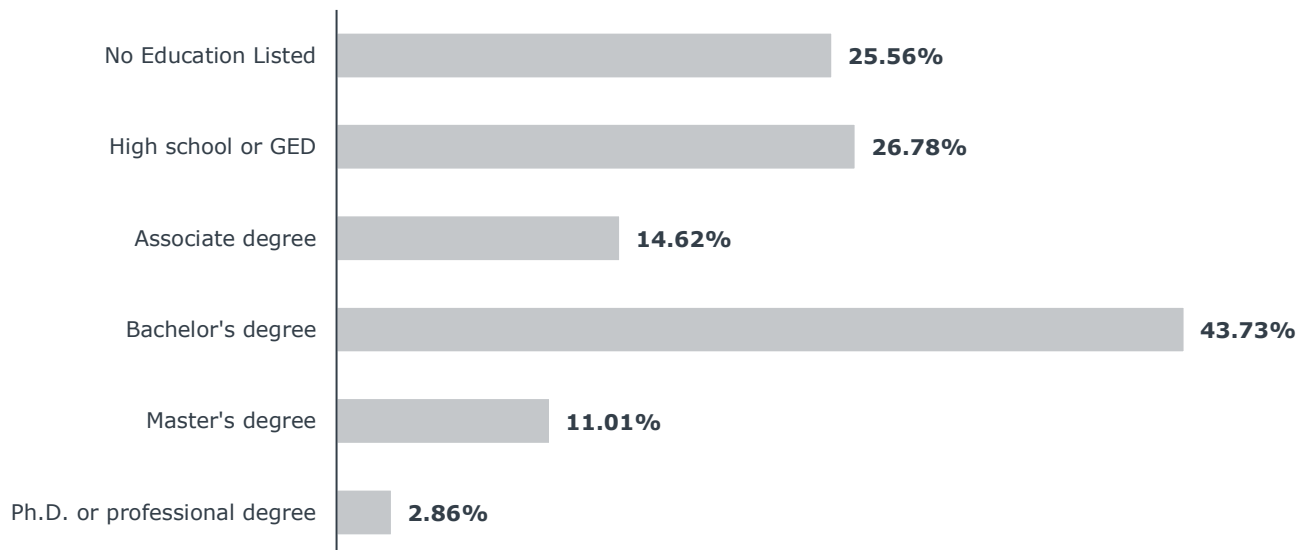
n = 846,306 job postings



Education Levels Requested of Electronics And Computer Engineering Applicants

October 2021 - September 2022, Regional Data

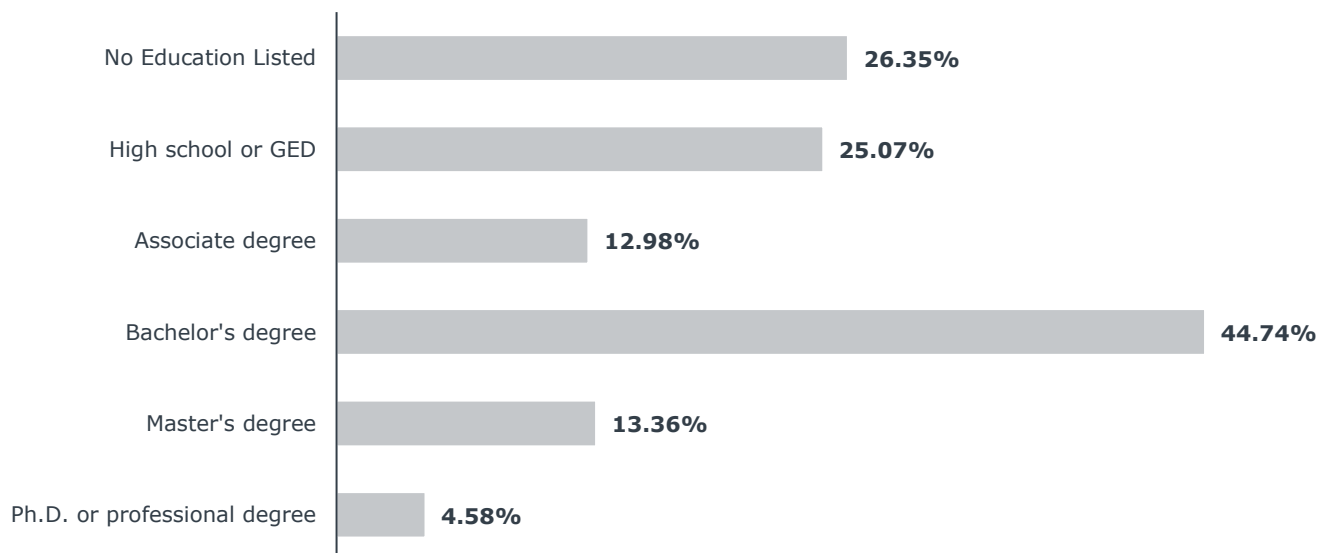
n = 222,359 job postings¹



Education Levels Requested of Electronics And Computer Engineering Applicants

October 2021 - September 2022, National Data

n = 1,891,630 job postings¹



1) The n-value reflects the number of job postings requesting any degree level electronics and computer engineering applicants rather than the number of postings requesting bachelor's-level electronics and computer engineering applicants.

Regional Analysis of Relevant CIP Codes¹ Bachelor's-Level Completions

Between the 2015-2016 and 2019-2020 academic years, average annual growth in relevant completions outpaced the average annual growth in the number of institutions reporting relevant completions over the same period (i.e., 5.68% vs. 1.92%). This indicates student demand grew faster than competition which could signal a favorable opportunity for new programs. However, the mean number of completions per institution reporting was over double the median number, suggesting larger institutions captured a disproportionate share of the market in the 2019-2020 academic year. No institutions reported completions with a 100% distance-delivery option, indicating the region is lacking in distance-delivery programs.

Completions Reported over Time

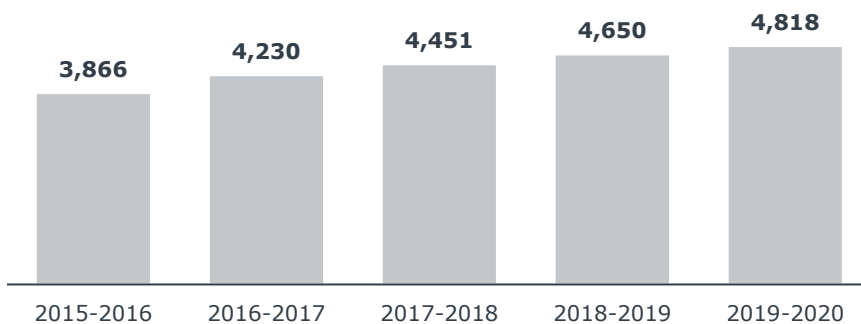
2015-2016 to 2019-2020 Academic Years, Regional Data

+5.68%

Average Annual Completions Growth

2015-2016 to 2019-2020 Academic Years, Regional Data

- Average annual 1.92% growth in number of institutions in the same period.



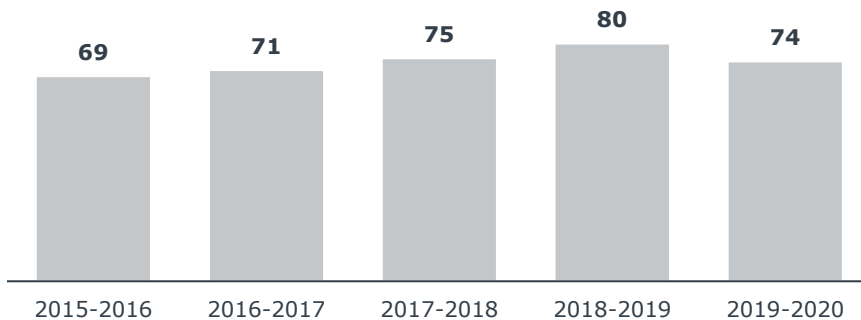
Institutions Reporting Completions over Time

2015-2016 to 2019-2020 Academic Years, Regional Data

0.00%

Institutions Reporting Completions with a 100% Distance-Delivery Option

2019-2020 Academic Year, Regional Data



65.11

Mean Completions per Institution Reporting

2019-2020 Academic Year, Regional Data

- An increase from the 56.03 mean completions reported in the 2015-2016 academic year.

32.50

Median Completions per Institution Reporting

2019-2020 Academic Year, Regional Data

- A decrease from the 33.00 median completions reported in the 2015-2016 academic year.

1) The aggregated completions data for CIP codes '14.4701 ("Electrical and Computer Engineering")', '14.0901 ("Computer Engineering, General")' and '14.1001 ("Electrical and Electronics Engineering")' is offered as an indicator of student trends because Electronics And Computer Engineering is not classified as a specific CIP code in NCES data. Additionally, the aggregate of three electronics and computer engineering related CIP codes were used in the competitive landscape portion of this analysis, meaning the number of relevant completions reported per institution could represent multiple related programs within that institution, rather than electronics and computer engineering programs exclusively.

Regional Analysis of Relevant CIP Codes¹ Bachelor's-Level Completions

Between the 2015-2016 and 2019-2020 academic years, nine of the top 10 institutions reporting relevant completions increased the number of completions reported and six increased their market share. The top three institutions reporting completions in the 2019-2020 academic year held over 30% of the market share despite making up less than 5% of institutions reporting completions. Further, all three reported significantly more completions than the rest of the top 10 institutions reporting in the region. This suggests these institutions are established competitors in the region and could pose significant challenges to new programs trying to enter the market. Between the 2015-2016 and 2019-2020 academic years, the current program at Bowling Green State University increased its reported completions from six to 12, indicating demand has increased at the partner institution.

Institutions with Most Reported Completions

2015-2016 to 2019-2020 Academic Years, Regional Data

Institution	Reported Completions, 2015-2016 Academic Year	Market Share, 2015-2016 Academic Year	Reported Completions, 2019-2020 Academic Year	Market Share, 2019-2020 Academic Year
Ohio State University-Main Campus	433	11.20%	669	13.89%
Purdue University-Main Campus	295	7.63%	435	9.03%
The Pennsylvania State University	Not Offered	Not Offered	405	8.41%
University of Michigan-Ann Arbor	185	4.79%	196	4.07%
University of Cincinnati-Main Campus	69	1.78%	178	3.69%
Drexel University	201	5.20%	168	3.49%
Michigan State University	134	3.47%	159	3.30%
Oakland University	83	2.15%	154	3.20%
University of Toledo	121	3.13%	144	2.99%
University of Pittsburgh-Pittsburgh Campus	111	2.87%	144	2.99%

Institution	Reported Completions, 2015-2016 Academic Year	Market Share, 2015-2016 Academic Year	Reported Completions, 2019-2020 Academic Year	Market Share, 2019-2020 Academic Year
Bowling Green State University	6	0.16%	12	0.25%

1) The aggregated completions data for CIP codes '14.4701 ("Electrical and Computer Engineering")', '14.0901 ("Computer Engineering, General")' and 14.1001 ("Electrical and Electronics Engineering") is offered as an indicator of student trends because Electronics And Computer Engineering is not classified as a specific CIP code in NCES data. Additionally, the aggregate of three electronics and computer engineering related CIP codes were used in the competitive landscape portion of this analysis, meaning the number of relevant completions reported per institution could represent multiple related programs within that institution, rather than electronics and computer engineering programs exclusively.

Source: EAB analysis. National Center for Education Statistics.

National Analysis of Relevant CIP Codes¹ Bachelor's-Level Completions

Between the 2015-2016 and 2019-2020 academic years, the number of relevant completions grew 5.43% on average annually, outpacing the average annual growth in the number of institutions reporting relevant completions (i.e., 1.81%). This indicates student demand grew faster than competition, which could signal a favorable opportunity to enter the market and capture some of the increasing student demand. Only 3.68% of national institutions reporting relevant completions reported completions with a 100% distance-delivery option, suggesting a relatively sparse online competitive landscape.

Completions Reported over Time

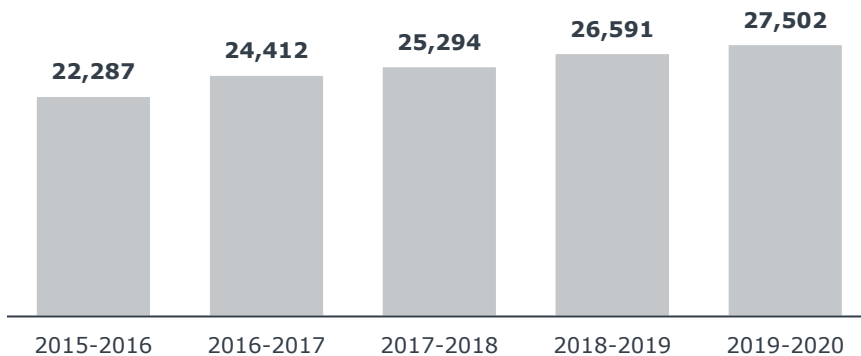
2015-2016 to 2019-2020 Academic Years, National Data

+5.43%

Average Annual Completions Growth

2015-2016 to 2019-2020 Academic Years, National Data

- Average annual 1.81% growth in number of institutions in the same period.



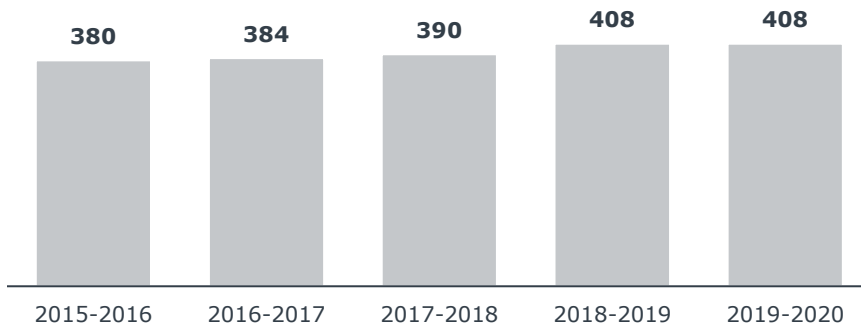
Institutions Reporting Completions over Time

2015-2016 to 2019-2020 Academic Years, National Data

3.68%

Institutions Reporting Completions with a 100% Distance-Delivery Option

2019-2020 Academic Year, National Data



67.41

Mean Completions per Institution Reporting

2019-2020 Academic Year, National Data

- An increase from the 58.65 mean completions reported in the 2015-2016 academic year.

37.50

Median Completions per Institution Reporting

2019-2020 Academic Year, National Data

- An increase from the 35.00 median completions reported in the 2015-2016 academic year.

1) The aggregated completions data for CIP codes '14.4701 ("Electrical and Computer Engineering")', '14.0901 ("Computer Engineering, General")' and '14.1001 ("Electrical and Electronics Engineering")' is offered as an indicator of student trends because Electronics And Computer Engineering is not classified as a specific CIP code in NCES data. Additionally, the aggregate of three electronics and computer engineering related CIP codes were used in the competitive landscape portion of this analysis, meaning the number of relevant completions reported per institution could represent multiple related programs within that institution, rather than electronics and computer engineering programs exclusively.

National Analysis of Relevant CIP Codes¹ Bachelor's-Level Completions

Between the 2015-2016 and 2019-2020 academic years, all of the top 10 institutions reporting relevant completions increased the number of completions reported and seven increased their market share. No institution in the top 10 held over 2.50% of the market in the 2019-2020 academic year, indicating there were no market dominators. However, The Ohio State University – Main Campus was the market leader in both the region and the nation in the 2019-2020 academic year, indicating the institution is a strong competitor and could pose challenges to the proposed program in both markets.

Institutions with Most Reported Completions

2015-2016 to 2019-2020 Academic Years, National Data

Institution	Reported Completions, 2015-2016 Academic Year	Market Share, 2015-2016 Academic Year	Reported Completions, 2019-2020 Academic Year	Market Share, 2019-2020 Academic Year
Ohio State University-Main Campus	433	1.94%	669	2.43%
University of Illinois Urbana-Champaign	465	2.09%	562	2.04%
University of California-Berkeley	365	1.64%	452	1.64%
Purdue University-Main Campus	295	1.32%	435	1.58%
The Pennsylvania State University	Not Offered	Not Offered	405	1.47%
Georgia Institute of Technology-Main Campus	371	1.66%	384	1.40%
Texas A & M University-College Station	291	1.31%	380	1.38%
The University of Texas at Austin	264	1.18%	359	1.31%
University of California-Irvine	159	0.71%	333	1.21%
Virginia Polytechnic Institute and State University	234	1.05%	312	1.13%

Institution	Reported Completions, 2015-2016 Academic Year	Market Share, 2015-2016 Academic Year	Reported Completions, 2019-2020 Academic Year	Market Share, 2019-2020 Academic Year
Bowling Green State University	6	0.03%	12	0.04%

1) The aggregated completions data for CIP codes '14.4701 ("Electrical and Computer Engineering")', '14.0901 ("Computer Engineering, General")' and '14.1001 ("Electrical and Electronics Engineering")' is offered as an indicator of student trends because Electronics And Computer Engineering is not classified as a specific CIP code in NCES data. Additionally, the aggregate of three electronics and computer engineering related CIP codes were used in the competitive landscape portion of this analysis, meaning the number of relevant completions reported per institution could represent multiple related programs within that institution, rather than electronics and computer engineering programs exclusively.

Appendix: Research Process and Sources

Research Methodology

EAB's market insights research guides strategic programmatic decisions at partner institutions. The Market Insights Service combines qualitative and quantitative data to help administrators identify opportunities for new program development, assess job market trends, and align curriculum with employer and student demand.

Unless stated otherwise, this report includes data from online job postings from October 2021-September 2022. To best estimate employer demand for bachelor's-level electronics and computer engineering professionals, the Forum analyzed job postings with relevant skills (e.g., "electronics," "computer engineering," "short circuits").

Research Questions

The requesting partner asked:

- **How has demand for graduates of my program evolved over time?**
- **In what positions do employers demonstrate the greatest need for graduates?**
- **In which industries should the program prepare students to work?**
- **What skills should the program teach to prepare students to meet employer demand?**
- **Which employers demonstrate the greatest demand for graduates?**
- **In which cities do employers demonstrate the greatest demand for potential graduates?**
- **What experience level do employers most frequently request from program graduates?**
- **What education level do employers most frequently request from program graduates?**
- **How many students graduate from similar programs regionally, and how has this changed over time?**
- How are similar programs structured?
- How are similar programs delivered?
- What experiential or practical learning do similar programs offer?
- What accreditation do similar programs hold?

Bolded questions were addressed within this analysis; remaining questions will be addressed if partner pursues additional research.

Definitions

"CIP" code refers to the Classification of Instructional Programming code.

"Region" and "regional" refer to the following states: Indiana, Michigan, Ohio, and Pennsylvania.

Project Sources

The Forum consulted the following sources for this report:

- EAB's internal and online research libraries
- Lightcast Analyst, described below
- U.S. Bureau of Labor Statistics
- U.S. National Center for Education Statistics (NCES)

Labor Market Intelligence Partner: Lightcast

This report includes data made available through EAB's partnership with Lightcast (formerly Economic Modeling Specialists International), a labor market analytics firm serving higher education, economic development, and industry leaders in the U.S., Canada and the United Kingdom.

Lightcast curates and maintains the most comprehensive labor market data sets available for academic program planning, providing real-time job posting data, workforce and alumni outcomes data, and traditional government sources of data. Under this partnership, EAB may use Lightcast's proprietary Analyst™ and Alumni Insight™ tools to answer partner questions about employer demand, the competitive landscape, in-demand skills, postings versus actual hires, and skills gaps between job postings and professionals in the workforce. The Lightcast tools also provide EAB with in-depth access to unsuppressed, zip-code-level government data for occupations, industries, programs, and demographics. For more complete descriptions of the Lightcast tools, visit:

- <http://www.economicmodeling.com/analyst/>
- <https://www.economicmodeling.com/alumni-insight/>

To learn more about Lightcast and its software and services, please contact Bob Hieronymus, Vice President of Business Development at bob.hieronymus@economicmodeling.com or (208) 883-3500.



Washington DC | Richmond | Birmingham | Minneapolis | New York | Chicago

202-747-1000 | eab.com









ECE New name and degree

Final Audit Report

2022-04-22

Created:	2022-04-22
By:	Kathryn Boyle (kmboyle@bgsu.edu)
Status:	Signed
Transaction ID:	CBJCHBCAABAAUnp_f-HmlaVcAl8nJZBbJ0bjb88_kbvM

"ECE New name and degree" History

-  Document created by Kathryn Boyle (kmboyle@bgsu.edu)
2022-04-22 - 5:07:07 PM GMT- IP address: 129.1.22.173
-  Document emailed to S. R. Kolla (skolla@bgsu.edu) for signature
2022-04-22 - 5:08:23 PM GMT
-  Email viewed by S. R. Kolla (skolla@bgsu.edu)
2022-04-22 - 5:23:43 PM GMT- IP address: 174.96.225.229
-  Document e-signed by S. R. Kolla (skolla@bgsu.edu)
Signature Date: 2022-04-22 - 5:24:50 PM GMT - Time Source: server- IP address: 174.96.225.229
-  Document emailed to MD Sarder (msarder@bgsu.edu) for signature
2022-04-22 - 5:24:53 PM GMT
-  Email viewed by MD Sarder (msarder@bgsu.edu)
2022-04-22 - 7:26:48 PM GMT- IP address: 108.204.224.177
-  Document e-signed by MD Sarder (msarder@bgsu.edu)
Signature Date: 2022-04-22 - 7:26:55 PM GMT - Time Source: server- IP address: 108.204.224.177
-  Agreement completed.
2022-04-22 - 7:26:55 PM GMT









ECE New name and degree - signed 5-10-22

Final Audit Report

2022-05-24

Created:	2022-05-23
By:	Kathryn Boyle (kmboyle@bgsu.edu)
Status:	Signed
Transaction ID:	CBJCHBCAABAA57ZboKoMwoMVPeuMQacmj175wSCmHt4d

"ECE New name and degree - signed 5-10-22" History

-  Document created by Kathryn Boyle (kmboyle@bgsu.edu)
2022-05-23 - 8:17:23 PM GMT- IP address: 129.1.22.173
-  Document emailed to Andreas Luescher (aluesch@bgsu.edu) for signature
2022-05-23 - 8:34:09 PM GMT
-  Email viewed by Andreas Luescher (aluesch@bgsu.edu)
2022-05-23 - 9:21:39 PM GMT- IP address: 47.21.94.218
-  Document e-signed by Andreas Luescher (aluesch@bgsu.edu)
Signature Date: 2022-05-23 - 9:21:49 PM GMT - Time Source: server- IP address: 47.21.94.218
-  Document emailed to Jared Tuberty (jaredt@bgsu.edu) for signature
2022-05-23 - 9:21:51 PM GMT
-  Email viewed by Jared Tuberty (jaredt@bgsu.edu)
2022-05-24 - 12:02:07 PM GMT- IP address: 129.1.22.188
-  Document e-signed by Jared Tuberty (jaredt@bgsu.edu)
Signature Date: 2022-05-24 - 12:02:17 PM GMT - Time Source: server- IP address: 129.1.22.188
-  Agreement completed.
2022-05-24 - 12:02:17 PM GMT