

Approval Chart for Curriculum Changes

A = Approve I= Information Item¹ R= Advise & Respond²

Course Number ENGR117 or Degree Plan(s) _____

State the requested change and reason. A memo may be attached if more space is necessary.

See new course packet.

Circle the number that corresponds to the requested change. Degree plan changes are on the second page.

		COUNCIL ³							
	Change to a Course	Dept./School	College Academic	Deans	TEC	UGEC	GRAD	Provost	President
1.	Title (description unchanged)	A	A	A		I		I	I
2.	Description (not affecting content)	A	A	A		I		I	I
3.	Course term(s)	A	I	A		I		I	I
4.	Content (substantive change)	A	A	A		I		A	I
5.	Number of hours (lecture, lab, contact)	A	A	A		A		A	I
6.	Course number within the hundred	A	A	I		I		I	I
7.	Course number beyond the hundred	A	A	A		A		A	I
8.	Prerequisites	A	A	A		I		I	I
9.	Course fee(s)	A	A	A		--		A	I
10.	From U to G or G to U	A	A	A		A		A	I
11.	Cross list with another department: U or G level	A	A	A		A		A	I
12.	Department of record	A	A	A		A		A	I
13.	Open or close a course	A	A	A		A		A	I
14.	New course — See website for application and process. This change includes combining or splitting a course(s).	A	A	A		A		A	I

Note: When an academic unit does not have a council, the UGEC and/or UUAC will serve as its academic council, depending on the nature of the issue.

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		COUNCIL ³										
	Change to a Degree Plan	Dept./School	College Academic	Deans	TEC	UGEC	UUAC	GRAD	Provost	Faculty	President	Board of Trustees
1.	University Requirements — Change in approved course content ⁶	A	A	A	A				A	--	A	--
2.	University Requirements — Add or drop a required course from the University Requirements chart ⁶	A	A	A	A				A	A	A	--
3.	University Requirements — Add or drop a course from a menu within the University Requirements ⁶	A	--	--	A				A	--	A	--
4.	University Requirements — Change hours within a menu on the University Requirements chart ⁶	A	A	A	A				A	A	A	--
5.	Major — Revision of major ^{4,5}	A	A	A	A				A	--	A	--
6.	Major — Adopt or change admission requirements	A	A	A	A				A	--	A	--
7.	Major — Add ^{4,5}	A	A	A	A				A	A	A	I
8.	Major – Discontinue (proposed by the department or college)	A	A	A	A				A	A	A	I
9.	Major – Discontinue (proposed by the Provost)	See below.										
10.	GPA — Revise major or cumulative requirement	A	A	A	A				A	A	A	--
11.	Minor — Revise course selection	A	A	A	I				I	--	I	--
12.	Minor — Add	A	A	A	A				A	--	A	--
13.	Minor – Discontinue (proposed by the department or college)	A	A	A	A				A	--	A	--
14.	Minor – Discontinue (proposed by the Provost)	See below.										
15.	Degree — Add	A	A	A	A				A	A	A	I
16.	Degree – Discontinue (proposed by the department or college)	A	A	A	A				A	A	A	I
17.	Degree – Discontinue (proposed by the Provost)	See below.										
18.	Any change to a graduate degree program	A	A	A	A				A	--	A	--

COUNCIL ³										
	Provost-Proposed Change	Provost	Department	Dean	TEC	UUAC	Graduate	Faculty	President	Board of Trustees
1.	Major/Graduate Program -- Discontinue (proposed by the Provost)	A	R	R	A			A	A	I
2.	Minor -- Discontinue (proposed by the Provost)	A	R	R	A			--	A	--
3.	Degree -- Discontinue (proposed by the Provost)	A	R	R	A			A	A	I

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COUNCIL ³										
	Change to the Catalog Information	Dept./School	College Academic	Deans	UGEC	UUAC	GRAD	Provost	Faculty	President
1.	General requirements for graduation including course requirements that are common to all majors for all degrees ⁷	--	--	--		A		A	A	A
2.	Admission requirements	--	--	--		A		A	A	A
3.	Policies governing academic probation and suspension	--	--	--		A		A	A	A
4.	Requirements for graduating with honors	--	--	--		A		A	A	A

¹ Councils may request additional information about "Information" items. These items are approved as "Consent Agenda."

² The Dean and Department should respond to the Provost's recommendation to close a program in writing. Advise & Respond (R) requires that the voting body should receive the written responses at least one week prior to the vote.

³ All courses that meet University Requirements for general education must go through UGEC. Courses or degrees offered only to students seeking teacher certification must go through the Teacher Education Council. All undergraduate changes must go before the UUAC. All graduate degree plan changes must go through the Graduate Council.

⁴ A minimum of 30 hours is required for a major. A maximum is specified for each degree (e.g., BA, BS). The university minimum for elective hours is 6, unless the requirements of external accrediting bodies make it impossible.

⁵ Program or course changes that apply to any major that includes Teacher Certification will be reviewed by the college, the Teacher Education Council (TEC), and then the UUAC.

⁶ Courses that satisfy ACU's University Requirements (General Education) will normally have lower-level numbering, be free of prerequisites and co-requisites, appeal to more than one or two majors, and "not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession" (SACS 2.7.3). Departments may request exceptions to the first three criteria.

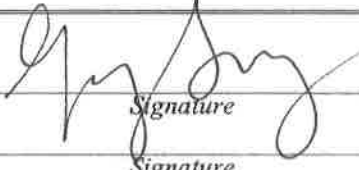
⁷ The UUAC approved the clarification that "general requirements for graduation" means the enumerated items in the "General Requirements for Bachelor's Degrees" section of the catalog.

Revised 8-26-19

Curriculum/Catalog Changes Signature Page

Department/School Chair(s)	
 Signature	1/21/2020 Approval date
_____ Signature	_____ Approval date

College Academic Council(s)	
 Signature	1-24-2020 Approval date
_____ Signature	_____ Approval date

Dean(s)	
 Signature	1/29/2020 Approval date
_____ Signature	_____ Approval date

Teacher Education Council	
_____ Chair's signature	_____ Approval date

General Education Council	
_____ Chair's signature	_____ Approval date

Undergraduate Academic Council	
_____ Chair's signature	_____ Approval date

Graduate Council	
_____ Chair's signature	_____ Approval date

Provost	
_____ Signature	_____ Approval date

Faculty	
_____ Chair of faculty senate	_____ Approval date

President	
_____ Signature	_____ Approval date

Application for a New Course v10.7

Discard instructional pages A-C before submitting application

Course ID (<i>Subject and Number</i>)	ENGR 117
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I. Systems and Catalog Information Complete each item.

1	Course Developer	Darby Hewitt
2	Course Instructor	Anyone in Engineering and Physics Department
3	Course Title	Computational Tools for Engineering and Physics
4	Course Abbreviation for Banner if title is more than 30 characters	Computational Tools for E&P
5	College	Arts and Sciences
6	Department or School	Engineering and Physics
7	Number of Credit Hours	1
8a.	Number of contact hours – lecture	0
8b.	Number of contact hours – lab/activity	3
9	Is the course for a fixed or variable number of credit hours?	fixed
10	Explanation for variable credit	--
11	Is the course repeatable for additional credit?	no
12	Maximum total number of credit hours a student can earn for this course	1
13	What type of course is this? (Select one option. Please see Schedule Type definitions on Page C.)	☐ Traditional lecture ☒ Traditional lab ☐ Traditional lecture/lab ☐ Experiential Learning ☐ Seminar ☐ Studio ☐ Thesis ☐ Dissertation
14	Number of faculty workload hours	3

15	Grade Mode	☒ Standard ☐ Credit/No Credit (undergrad only)
16	Maximum Enrollment	20
17	Catalog Description (50 words or less)	This course is designed to introduce computational tools and programming fundamentals to engineering and physics students through hands-on projects involving embedded computing platforms and sensors.
18	List any prerequisites (course/s, test scores, class standing, major, etc.)	MATH 124 or simultaneous enrollment.
19	List any corequisites (these <i>must</i> be taken at the same time; note that a single requirement cannot be both a prerequisite <i>and</i> a corequisite)	--
20	If the course is cross-listed, specify the Course ID(s)	--
21	Does this course require any additional student course fees?	☐ No ☒ Yes If yes, attach a completed "Request to Add or Change Course Fees" form. Describe in section IV-8.
22a	Will the course be offered in fall terms?	☒ No ☐ Yes If yes: all, even, or odd years?
22b	Will the course be offered in spring terms?	☐ No ☒ Yes all years
22c	Will the course be offered in summer terms?	☒ No ☐ Yes If yes: all, even, or odd years?
23	First semester this course will be offered under new Course ID. <i>May not be earlier than the coming fall semester.</i>	Spring 2021
24	Is this course required for a degree/s?	☐ No ☒ Yes If yes, attach a revised degree plan(s) reflecting the placement of the new course.
25	Should the addition of this course be retroactively applied to the degree plan it supports? <i>This is rare, and rationale should</i>	☒ No ☐ Yes If yes, provide rationale:

	<i>explain compelling extenuating circumstances.</i>	
26	Has this course been offered as a Special Topics course? <i>New courses are not required to be taught as Special Topics courses prior to approval.</i>	☐ No ☒ Yes If yes, provide course ID, term, and enrollment: January short course, 2019
27	List any courses in which the content overlaps the proposed course. (Course ID and Name) <i>Attach a statement from the instructor/dept chair of the existing course justifying the new offering in Section IV-D.</i>	CS 115 (Introduction to Programming Using Scripting)

II. Curriculum

- A. Explain effect on degree plans. If the addition of the course alters degree requirements, submit a separate Approval Chart for Curriculum Change to update the degree plan.

This course will be required in the BSE degree plan (see Approval Chart for details). However, because an hour is being dropped from another required course (ENGR115), this new requirement won't change the total number of required hours in the degree.

- B. Justify the addition of this course to the current curriculum, explaining the gap it meets.

This course will give students an introduction to the basics of programming with the goals of 1) interfacing with external hardware and 2) solving engineering and physics problems. Without this introductory course, many of our engineering students would not see programming at all. And, because of restrictions on the total number of hours in the BSE degree plan, we cannot require our students to take a 3-hour course from SITC to fill this gap. This course will provide baseline exposure to an important skill in the context of engineering and physics and within a single credit hour.

III. Course Design

- A. Audience and Course Goal

1. Describe the intended audience, including prerequisite skills

The intended audience for this course is first-year engineering or physics majors in their second-semester; the prerequisite for this course is only "Credit for or concurrent enrollment in MATH 124", which nearly all the students in this course would have taken during the prior semester.

2. State the overarching course goal(s) in performance terms.

At the end of this course, students should have the ability to read and understand basic high-level computer code, and generate code to perform simple computing tasks related to engineering and physics problem solving, including interfacing with microcontrollers and sensors.

B. Student Learning Outcomes and Measurements

	Student Learning Outcome	Measurement
1	Students will be able to represent numerical values as variables	Homeworks, projects
2	Students will be able to understand and use logical statements	Homeworks, projects
3	Students will be able to understand and use loops	Homeworks, projects
4	Students will be able to solve engineering problems in a programming context	Homeworks, projects
5	Students will be able to create graphical representations of data using charts and graphs	Homeworks, projects

3. Text and Resources

Give the full publication information of the textbook/s and other required resources and outside readings.

Getting Started with Adafruit Circuit Playground Express by Mike Barela
ISBN-13: 978-1680454888

Python and Matplotlib Essentials for Scientists and Engineers by Matt A. Wood
ISBN-13: 978-1627056199

Students will also need to purchase an Adafruit Circuit Playground Express for the course:
<https://www.adafruit.com/product/3333>

IV. Supporting Documentation

Required of all applications	
1	Approval Chart for Curriculum Changes

2	Syllabus — Attach the syllabus for the course based upon the anticipated first-semester offering.
3	Instructional Design — The syllabus must be reviewed by the Adams Center. Attach a copy of the Adams Center letter.
4	Library — Submit new course application and syllabus to the Library dean's office. Attach the Library's memo.
Attach if applicable	
5	Content Overlap — Include one document for each course you listed in Section I-27. Attach statement from instructor/dept chair of existing course justifying the new offering.
6	Departmental Resources — List the resources that support the course and are available only through the department, if applicable. Attach the list of the holdings and the location/s.
7	Resources — List resources (other than library or departmental resources) that are needed to support this course (computers, lab equipment, other technology, etc.). Attach a complete list of all items and indicate possible sources or estimated cost of each. List the sources of any needed funds.
8	Expenses — List additional expenses needed to implement this course (full-time or part-time faculty, graduate or lab assistants, student employees, travel, special student costs, room renovation, storage facility, etc.). Attach a complete list of all items, the estimated cost of each and the source of the funds.
9	Justification — Attach any documents to which you refer in Section II-B.

ENGR 117 - Computational Tools for Engineering and Physics

In this course, students will learn the basics of programming through a series of projects which apply to engineering and physics principles.

Course number and title: ENGR 117 - Computational Tools for Engineering and Physics

Credit hours: 1

Semester and year: Spring 2021

Meeting time and place: OSC B35, Tuesday 1:30pm-4:20pm

Prerequisites/corequisites: Credit for or concurrent enrollment in MATH 124

Catalog description: Introduction to the elements of programming which are most useful for engineers and physicists: variable definition, equations, conditional statements, and loops.

Intended audience: First year Engineering and Physics majors

About the Teacher

Professor's name, title, or rank: Dr. Robert Brown

Office location: OSC 123C

Phone number: (918) 260-9772 (cell)

Email address: rlb16c@acu.edu

Office hours/Contact expectations: I am excited to answer questions and provide clarification to concepts discussed in class. My office hours are MWF 1:00-3:30pm, or by appointment.

Mission Statements

The mission of ACU: to educate students for Christian service and leadership throughout the world.

The mission of the College of Arts and Sciences: to educate students for worldwide Christian service and leadership through programs of study and other learning experiences that blend a liberal arts education with professional and career education.

The mission of the Engineering and Physics Department:

The ACU engineering program strongly supports the university's mission of educating students for Christian service and leadership throughout the world. In support of this mission, ACU engineering graduates will attain:

- A deep and broad understanding of engineering principles and practices as evidenced by professional employment, continued professional development and graduate study in engineering or other professional fields.
- An extensive knowledge of the innovative design processes unique to engineering professionals, as demonstrated by using critical thinking skills in contribution to scientific and technical literature, patents and intellectual property, professional societies, and creative designs.
- A thorough understanding of Christian service and leadership as shown in commitments to professionalism, ethics, and service and leadership within the engineering profession, church and society.

Unique Christian Perspective: As a Christian engineer, I believe you can best glorify God by excelling in your chosen profession, and doing so morally and ethically. The foundation of this excellence is technical proficiency, without which moral and ethical concerns cannot be addressed. This course is intended to provide you with technical skills required for a moral and ethical engineer.

Course Content

Outline of topics: This course will cover the fundamentals of programming: variable assignment, equations, conditional statements, and loops. Additionally, those concepts will be applied to basic engineering and physics problems.

Format of Class

Format of Class: Class will consist of a short period of instruction followed by team-based programming with professional support.

Instructional Materials

Textbooks:

- *Getting Started with Adafruit Circuit Playground Express* by Mike Barela (ISBN-13: 978-1680454888)
- *Python and Matplotlib Essentials for Scientists and Engineers* by Matt A. Wood (ISBN-13: 978-1627056199)

Students will also need to purchase an Adafruit Circuit Playground Express for the course:

<https://www.adafruit.com/product/3333>

Learning Outcomes

Course goal: This course will provide students with the basic skills necessary to use a programming language in an engineering context (i.e. to solve problems and generate graphical representations of data).

Competencies:

Competency	Measurement Instrument
Students will be able to represent numerical values as variables	Homeworks, projects
Students will be able to understand and use logical statements	Homeworks, projects
Students will be able to understand and use loops	Homeworks, projects
Students will be able to create graphical representations of data using charts and graphs	Homeworks, projects
Students will be able to solve engineering problems in a programming context	Homeworks, projects

Assessment and Grading

Assessment Activities	Weighting
Homeworks	40%
In-class work	20%
Projects	40%
Total	100%

Final grade calculation:

Range of Points	Final Letter Grade
90%-100%	A
80%- 89%	B
70%-79%	C
60%-69%	D
Below 59%	F

University Policies

ADA Compliance Policy:

"Abilene Christian University is dedicated to removing barriers and opening access for students with disabilities in compliance with ADA and Section 504 of the Rehabilitation Act. The Alpha Scholars Program facilitates disability accommodations in cooperation with instructors. In order to receive accommodations, you must be registered with Alpha Scholars Program, and you must complete a specific request for each class in which you need accommodations. If you have a documented disability and wish to discuss . academic accommodations, please email alpha@acu.edu call their office directly at 325-674-2667.]

Academic Integrity Policy

"Academic integrity is defined as academic work completed as assigned for each class by the individual or group responsible for the work. Violations of academic integrity and other forms of cheating involve the intention to deceive, mislead, or misrepresent and therefore, are a form of lying. Such actions are contrary to behavioral norms that flow from the nature of God. Academic misconduct includes, but is not limited to, the following: 1) Failure to give credit to sources used in a work in an attempt to present the work as one's own, 2) Submission of papers or projects obtained from another source (e.g., research service or club paper file) as one's own, and 3) Falsifying information orally or in writing. Academic misconduct may result in, but is not limited to, a zero on the assignment and/or an F in the course. Additionally, the department chair, Dean of your school, and the Dean of Student Life will be notified. See the full university policy, including how to appeal a decision, by following [this link](#)."

Anti-Harassment Policy:

As a professor, one of my responsibilities is to help create a safe learning environment on our campus. I also have a mandatory reporting responsibility related to my role as a professor. It is my goal that you feel able to share information related to your life experiences in classroom discussions, in your written work, and in our one-on-one meetings. I will seek to keep the information you share private to the greatest extent possible. When I am not able to keep your information confidential, I will only share it with responsible administrators on campus who can provide you with services and resources. I am required to share with the Title IX Coordinator information regarding sexual misconduct or harassment, dating or domestic violence or stalking that you report to me. If you would prefer to share information in a confidential setting, I encourage you to speak with someone in the [ACU Counseling Center](#). All of your options are available for review by clicking on the link to ACU's [policy](#).

Course Policies

Attendance : A significant portion of the grade is in-class work. For excused absences, you may complete this work on your own time for full credit. For unexcused absences, this work will not be accepted for credit.

Tardiness : Students are expected to arrive on time.

Participation : Students should work with their team or alone as appropriate on in-class work. It is suggested that when in-class work is complete, students start on homework assignments.

Late assignment/exam : No late work will be accepted. Check Canvas for due dates of all assignments.

Technology use : Students may use their own computers if desired, but computers will be provided in the lab. Computers should only be used for programming and necessary research.

Tentative Calendar (check Canvas for up-to-date calendar)

Week	Topic	Assignments/Assessment
Week 1	Course introduction	In-class 1, Homework 1
Week 2	Variables and Equations	In-class 2, Homework 2
Week 3	Conditionals	In-class 3, Homework 3
Week 4	Project 1	Project 1
Week 5	Loops A	In-class 4, Homework 4
Week 6	Loops B	In-class 5, Homework 5
Week 7	Loops with conditionals	In-class 6, Homework 6
Week 8	Project 2	Project 2
Week 9	Plotting A	In-class 7, Homework 7
Week 10	Plotting B	In-class 8, Homework 8
Week 11	Putting it all Together	In-class 9, Homework 9
Week 12	Final Project Start	Final Project
Week 13		
Week 14		
Week 15	Final Project End	

Dr. Robert Brown
Onstead Science Center 123C
Rlb16c@acu.edu
(918)260 9772

October 30, 2019

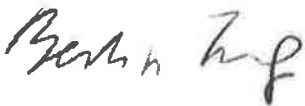
Re: Review of ENGR117

Dear Dr. Brown,

Thank you for submitting ENGR117: Engineering Career Skills. I have reviewed it based on the ACU Syllabus Guidelines. I find the syllabus to be meeting all requirements. One minor concern I have is that "tardiness" does not seem to have consequences associated with it. Attendance policy could also be clarified; you can explain how many unexcused absences will drop them from the class (usually 20% according to university policies). You might want to revise these items before sending the syllabus to the council. There is no need to bring it back to the Adams Center for further review.

Please note that this letter is not meant to be a final approval in the course application process. Your department chair and members of the council may have questions or comments of their own.

If you have any questions, please feel free to let me know. Please also let me know if we can be of any help in the design and facilitation of this course.

A handwritten signature in black ink, appearing to read "Robert Brown".

Director of Instructional Design, Adams Center

ABILENE CHRISTIAN UNIVERSITY

LIBRARY

M E M O R A N D U M

DATE: 16:31
TO: Dr. Robert Brown
FROM: Mark McCallon, Associate Dean for Library Services
RE: New Course Proposal, ENGR 117 – Computational Tools for Engineering and Physics

The library has examined the course application and syllabus and is able to support the proposed course. Thank you for letting us review the course proposal.

[Type here]

SCHOOL OF INFORMATION TECHNOLOGY AND COMPUTING

MEMORANDUM

DATE: October 16, 2019
To: Darby Hewitt
FROM: John Homer, Director for SITC
RE: New Course Proposal for ENGR 117

After reviewing the course proposal and justification for ENGR 117 "Computational Tools for Engineering and Physics" and with awareness of expected overlap in content with CS 115 "Introduction to Programming Using Scripting," the School of Information Technology and Computing supports the creation of this 1-hour ENGR course.

In this endorsement, we recognize that curriculum decisions are driven by restrictions on maximum number of hours that can be required for a degree plan and the necessity of satisfying requirements for an external accrediting organization. In future, if possible, we expect that this cursory introduction to computer programming will be complemented within the degree plan by the inclusion of one or more 3-hour computer programming courses offered by the School of Information Technology and Computing.



Request to Add or Change Course Fees

Course fees or changes to existing course fees must be approved and published in the ACU Catalog for the following year in order for them to be assessed on a student's account. Course fees which are not processed by February 1st will not be included in the fall catalog.

Request Date 11/30/2019

Amount of Fee \$70

Department Making Request Engineering and Physics

Contact Person CAS Dean

Semester and year for fee to begin : Fall 2019

Check the appropriate fee category below:

FOAP: 202812 20580 8105 10 \$63

☒ Fee is the same for every section and every student

202034 20500 8105 10 \$7

☐ Fee applies to certain sections only

If fee applies to certain sections only, please specify below if it is a one-time fee for a single section or a repeating fee that will be applied on a regular schedule (e.g., a fee charged each time the course is taken in a summer session but not in the fall or spring).

This request applies to the following course (one per form):

Course Number / Section

Course Title

ENGR 117

Computational Skills for Engineering and Physics

State the justification for your request below. You will be notified of final approval or denial.

Support of Laboratory experience

The following signatures must be obtained before any request is approved.

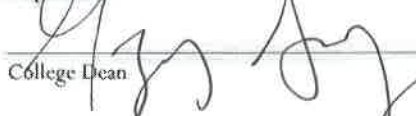
Approved

Declined


Department Chair

12/5/19
Date

☒ ☐


College Dean

1/29/2020
Date

☒ ☐


Provost

Date

☐ ☐

Vice President for Finance

Date

☐ ☐

If approved by all above, route to:

Controller

FOAP

Finance

Fee Code for use on course

Registrar's Office

Date Completed

Can use
existing
PELF
detail code