

# Natural Sciences

## The Human Experiences and Endeavors Curriculum

**Courses submitted for inclusion in the Natural Sciences Core must already exist or must be approved by the Undergraduate Council.**

Course Title: Introduction to Biological Investigation Department and Course Number: BIOL 10523 Instructor(s): Luque and Demarest
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Please indicate below which *Student Action Steps*\*\* are appropriate for your course for each *Learning Outcome*\*. Using the bulleted instructions on page 2 of this form, please provide examples that explain how students will, through the use of *Student Action Steps*, achieve the *Learning Outcomes* in your course.

**Competency:** TCU graduates will be literate in the natural sciences.

<b><i>Learning Outcomes:</i></b>	<b><i>Student Action Steps:</i></b> <b>Indicate which are to be used in your course or add others you will use to reach the selected <i>Learning Outcome(s)</i>.</b>
Students will demonstrate a basic understanding of some of the methods of investigation in the natural sciences.	<p>Students will explore investigation methodologies and principles through multiple experiences involving laboratory experiments, field studies, or simulations appropriate to the natural science discipline. For each investigation process or principle, students will: determine its purpose, describe it, and compare and contrast it with alternative methodologies. [    ]</p> <p>Other: Students will utilize investigation methodologies, principles, and techniques in laboratory experiments and simulations in Biology. In such investigations, students will: evaluate the purpose or role of the methodologies, principles, and techniques in answering a biological question; apply them in an experiment designed to answer the biological question; analyze the results (data) of the experiment to arrive at an answer to the question; consider the strengths, weaknesses, and limits of the finding; and consider other methodologies, principles, and techniques that could be applied to confirm the findings or further investigate the question.</p>
Students will demonstrate a basic understanding of some of the great ideas in the natural sciences.	<p>Students will examine some of the major ideas appropriate to the area of study, including how such ideas resulted from a scientifically reasoned investigation. For each concept, principle, or theory, students will: describe it, review its history, determine its importance (including influences on other areas of study), review the evidence supporting it, and compare and contrast it with alternative concepts, principles, or theories. [    ]</p> <p>Other: Students will consider and interpret biological observations and experimental results in the context of key concepts, principles, and theories of Biology, as a framework for understanding and/or a test of their validity.</p>

Students will demonstrate a basic understanding of some of the relationships among the natural sciences, technology, and society.	<p>Students will explore the relationships between science, technology, and society appropriate to the natural science discipline. Students will: describe the roles that each plays in the others' development, and identify the benefits and problems associated with each relationship. [     ]</p> <p>Other: Students will explore, consider, and discuss the current and potential future influences, roles, and impacts of biological ideas, techniques, and capabilities in the human experience.</p>
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\*The *Learning Outcomes* are statements of what we expect our students to know or be able to do upon completion of a course in that category.

\*\*The *Student Action Steps* identify the process(es) that will lead to the intended *Learning Outcome*. As such, *Student Action Steps* must specify an action(s) to be taken by a student to fulfill a specific *Learning Outcome* and be reasonable within the context and time frame of the course. The *Student Action Steps* above are provided as examples of how students might achieve the *Learning Outcomes*.

- Please provide examples that explain how students will, through the use of *Student Action Steps*, achieve the *Learning Outcomes* in your course (2 or 3 examples will suffice). To facilitate understanding, please use language accessible both to faculty who might be outside your discipline as well as to students who might see such language in a course syllabus.

1. **Students will utilize investigation methodologies, principles, and techniques in laboratory experiments and simulations in Biology. In such investigations, students will: evaluate the purpose or role of the methodologies, principles, and techniques in answering a biological question; apply them in an experiment designed to answer the biological question; analyze the results (data) of the experiment to arrive at an answer to the question; consider the strengths, weaknesses, and limits of the finding; and consider other methodologies, principles, and techniques that could be applied to confirm the findings or further investigate the question.**

Students will learn the principles of experimental design and conduct scientific experiments with analysis in order to answer biological questions. For example, in one series of labs, students will design an experiment to test whether a given chemical causes genetic mutations, using bacteria as their model assay organism. This will involve an understanding and application of multiple genetic and microbiological principles and techniques, and accurate interpretation of the resulting data to draw a supported conclusion. This exercise will culminate in a scientific paper in which the students will explain their methods, share their data, analyze their results, compare them to the current scientific knowledge as published in the scientific literature. In another laboratory, students will use Microsoft Excel to construct different models of population growth, and examine how changes in various biological and environmental variables impact the outcome predicted by the different models. This exercise will introduce students to the purpose of models in scientific investigation, in terms of their practical utility, predictive value, limits, and role in hypothesis testing.

2. **Students will consider and interpret biological observations and experimental results in the context of key concepts, principles, and theories of Biology, as a framework for understanding and/or a test of their validity.**

Students will regularly evaluate and make sense of observations made in the lab against broader biological ideas in ways that reinforce those ideas, or suggest how they could, in principle, contradict those ideas. For example, students will examine the macroscopic and microscopic anatomies of a variety of tissues and organisms to explore the principle that form follows function, and to confirm the universality among but diversity within different groups of life, and the validity of using key defining and distinguishing characteristics to classify living things and establish their evolutionary (phylogenetic) relationships. Students will also use statistics as a means to contend with the variability inherent within populations, both in terms of describing the nature of the variation in different characteristics and for identifying true differences between groups, and will observe the process of genetic mutation as the source of that ultimate variation. Building on this further, students will conduct a simulation in which they use the rolling of dice to replicate the random mixing of height alleles (gene

variants) via sex in a population, thus demonstrating the manner in which sexual reproduction boosts the diversity of height outcomes that occur in a population and distributes them into a normal curve. Other great ideas and principles that will be explored and confirmed across the lab experience include principles of genetics (inheritance), cell theory, and endosymbiotic theory, among others.

**3. Students will explore, consider, and discuss the current and potential future influences, roles, and impacts of biological ideas, techniques, and capabilities in the human experience.**

This course will encounter and work with numerous ideas and investigative or manipulative capabilities that hold implications for our lives and society, and we will take time to have conversations about the manner in which these things have shaped and may in the future influence such things as our concept of our place in the world, what it means to be human, our quality of life, and the practical and ethical concerns we raise. For example, questions about how we view and handle biological differences between people and how we treat other animals vs. plants vs. bacteria will be brought to bear as students contend with both the commonality and diversity of life within and between species. Similarly, the various genetic techniques that students will work with will raise questions about the extent to which we can vs. should alter our own blueprint or that of other living things, and for what purpose, either through the selective breeding of the past or the direct and targeted manipulation of gene sequences now and in the future. One experimental series will involve using the polymerase chain reaction (PCR) to amplify genes. This technology has revolutionized scientific research and technological innovation by making possible all of the modern genetic pursuits, ranging from genealogy and identification of paternity and crime scene investigation to genetic engineering and the production of genetically modified organisms, along with all of the societal implications that follow.

- Please attach a syllabus as the primary supporting document for your course proposal. Syllabi should reflect the *Learning Outcomes* and the use of the indicated *Student Action Steps*. They should also indicate how student performance will be evaluated with respect to the outcomes.

## GRADUATE COUNCIL: PROPOSAL FOR CHANGE IN EXISTING COURSE/PROGRAM

### Originating Unit

**Type of action:**      change in course      change in program

**Type of change requested:**

Number

Course Title

Description

Prerequisite(s) Program

Drop Course

Requirements

Drop Program\*

Other, please specify

*\*A SACSCOC Drop Program Justification form will need to be completed*

**Semester and year course/program will take effect:**

**Course instructional methodology:**

course component types: [ugradcouncil.tcu.edu/forms/Course Component Types.pdf](http://ugradcouncil.tcu.edu/forms/Course%20Component%20Types.pdf)

Current name:

Proposed name:

Appropriate computer abbreviation (30 spaces or less):

***Programs Only***

Current program code:

(ex:EDCE-PHD)

Proposed code (list 2)

or

Current CIP code:

Does the change require a new or change in CIP code:      Yes      No

If yes, what is the proposed new CIP code:

\*for reference please visit: [nces.ed.gov/ipeds/cipcode/resources.aspx?y=56](http://nces.ed.gov/ipeds/cipcode/resources.aspx?y=56)

Is the program already considered TCU STEM:      Yes      No

Does the change include a request to be a TCU STEM program:      Yes      No

**Description of change** (omit if dropping a course or program):

**Present Catalog Copy**

**Proposed Catalog Copy:**

**Supporting evidence or justification:**

**Explain how the change(s) will affect the current outcomes and assessment mechanisms?**

**Additional resources required**

**Faculty:**

**Space:**

**Equipment:**

**Library:**

**Financial Aid:**

**Other:**

**Change in teaching load:**

**Does this change affect any other units of the University?   Yes      No**

If yes, submit supporting statement signed by chair of affected unit.

**If cross-listed, provide evidence of approval by all curriculum committees appropriate to both the originating and the cross-listed units.**

**Chair of Originating Unit:**

**Name:**

**Unit:**

**Signature:**



**UNDERGRADUATE COUNCIL**  
**Request for Change(s)**

Originating unit requesting  
change

Physics & Astronomy

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Type of Change  
requested:

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Course number(s)   | <input type="checkbox"/> Course prerequisite(s) | <input type="checkbox"/> Program title                   |
| <input type="checkbox"/> Course title       | <input type="checkbox"/> Drop course(s)         | <input type="checkbox"/> Program description             |
| <input type="checkbox"/> Course description | <input type="checkbox"/> Drop program(s)        | <input checked="" type="checkbox"/> Program requirements |

Semester and year change(s) take effect:

Fall 2022

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Appropriate computer abbreviation if  
course title is more than 30 spaces:

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Briefly summarize the change requested:

We are changing the BS in Biophysics to align with the changes in the introductory biology sequence.

Catalog copy

Present catalog copy (paste-up from  
catalog is acceptable.

Proposed change(s). (Include exact catalog  
copy as desired. Underline changes)

The program of study requires a minimum of 35 hours on a 124-hour degree, consisting of:

...

Also required are:

~~BIOL 10501 Introductory Biology Lab I~~

~~BIOL 10503 Introductory Biology I~~

CHEM 10113 General Chemistry I

CHEM 10123 General Chemistry II

CHEM 10122 General Chemistry II Laboratory

OR

CHEM 20123 Quantitative Analysis

9 hours selected from

~~BIOL 10511 Introductory Biology Lab II~~

~~BIOL 10513 Introductory Biology II~~

BIOL 30603 Cellular, Molecular, and Developmental Biology

BIOL 30304 Microbiology

BIOL 30603 Cellular, Molecular, and Developmental Biology

CHEM 30123 Organic Chemistry I

CHEM 30133 Organic Chemistry II

CHEM 30143 Organic Qualitative Analysis

CHEM 40503 Basic Biochemistry

The program of study requires a minimum of 35 hours on a 124-hour degree, consisting of:

....

Also required are:

BIOL 10503 The Unity of Life: Molecules to Cells

BIOL 10523 Introduction to Biological Investigation

CHEM 10113 General Chemistry I

CHEM 10123 General Chemistry II w

CHEM 10122 General Chemistry II Laboratory

OR

CHEM 20123 Quantitative Analysis

7 hours selected from

BIOL 10513 The Diversity of Life: Organisms to Ecosystems

BIOL 30603 Cellular, Molecular, and Developmental Biology

BIOL 30304 Microbiology

BIOL 30603 Cellular, Molecular, and Developmental Biology

CHEM 30123 Organic Chemistry I

CHEM 30133 Organic Chemistry II

CHEM 30143 Organic Qualitative Analysis

CHEM 40503 Basic Biochemistry

1. What is the justification for the change(s) requested?  
The biology department is changing its introductory biology sequence.
  
2. If applicable, explain how the change(s) will affect the current program outcomes and assessment mechanisms. The changes will not affect the current program outcomes and assessment mechanisms.  
These changes will have no impact on the current program outcomes or assessment mechanisms.
  
3. **Faculty Resources:** How will the unit provide faculty support for this change and any other impact this change may have on other current departmental listings.  
This will not impact other current departmental listings and will not require additional faculty support.
  
4. **Educational Resources:** Will this change require additional resources not currently available (e.g. space, equipment, library, other)? ☐ YES  
If yes, list additional resources needed. ☒ NO
  
5. If this change affects other units of the University, include a statement signed by the chairperson(s) of the affected unit(s).
  
6. If cross-listed, provide evidence of approval by all curriculum committees appropriate to both the originating and cross-listed units.



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Approval signature of chairperson of originating unit

**UNDERGRADUATE COUNCIL**  
**Request for Change(s)**

Originating unit requesting  
change

Physics & Astronomy

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Type of Change  
requested:

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Course number(s)   | <input type="checkbox"/> Course prerequisite(s) | <input type="checkbox"/> Program title                   |
| <input type="checkbox"/> Course title       | <input type="checkbox"/> Drop course(s)         | <input type="checkbox"/> Program description             |
| <input type="checkbox"/> Course description | <input type="checkbox"/> Drop program(s)        | <input checked="" type="checkbox"/> Program requirements |

Semester and year change(s) take effect: Fall 2022

Appropriate computer abbreviation if  
course title is more than 30 spaces: \_\_\_\_\_

Briefly summarize the change requested:

We are changing the Biophysics minor to align with the changes in the introductory biology sequence.

Catalog copy

Present catalog copy (paste-up from  
catalog is acceptable.

Proposed change(s). (Include exact catalog  
copy as desired. Underline changes)

The program of study requires a minimum of 18 hours consisting of:

PHYS 10154 General Physics I with Laboratory

PHYS 10164 General Physics II with Laboratory

OR

PHYS 20474 Physics I with Laboratory: Mechanics

PHYS 20484 Physics II with Laboratory: Electromagnetism and Optics

AND

~~BIOL 10501 Introductory Biology Lab I~~

~~BIOL 10503 Introductory Biology I~~

~~OR~~

~~BIOL 10511 Introductory Biology Lab II~~

~~BIOL 10513 Introductory Biology II~~

~~AND~~

~~PHYS 30473 How the Human Body Works~~

~~OR~~

~~PHYS 30483 Physics III Laboratory~~

~~AND~~

~~PHYS 3 hours of approved electives 30000 or above~~

~~OR~~

3 hours of Research from:

PHYS 30003 Junior Honors Research in Physics or Astronomy

PHYS 40003 Senior Honors Research in Physics or Astronomy

PHYS 40103 Senior Research in Physics or Astronomy

PHYS 50970 Special Problems in Physics

The program of study requires a minimum of 20 hours consisting of:

PHYS 10154 General Physics I with Laboratory

PHYS 10164 General Physics II with Laboratory

OR

PHYS 20474 Physics I with Laboratory: Mechanics

PHYS 20484 Physics II with Laboratory: Electromagnetism and Optics

AND

BIOL 10503 The Unity of Life: Molecules to Cells

OR

BIOL 10513 The Diversity of Life: Organisms to Ecosystems

AND

BIOL 10523 Introduction to Biological Investigation

6 hours selected from:

PHYS 30003 Junior Honors Research in Physics or Astronomy

PHYS 30313 Theoretical Methods in Physics

PHYS 30473 How the Human Body Works

PHYS 30483 Physics III Laboratory

PHYS 30553 Mechanics

PHYS 30603 Thermal Physics

PHYS 30843 Biomedical Imaging

PHYS 40003 Senior Honors Research in Physics or Astronomy

PHYS 40103 Senior Research in Physics or Astronomy

PHYS 50970 Special Problems in Physics

1. What is the justification for the change(s) requested?  
The biology department is changing its introductory biology sequence.
  
2. If applicable, explain how the change(s) will affect the current program outcomes and assessment mechanisms. The changes will not affect the current program outcomes and assessment mechanisms.  
These changes will have no impact on the current program outcomes or assessment mechanisms.
  
3. **Faculty Resources:** How will the unit provide faculty support for this change and any other impact this change may have on other current departmental listings.  
This will not impact other current departmental listings and will not require additional faculty support.
  
4. **Educational Resources:** Will this change require additional resources not currently available (e.g. space, equipment, library, other)?  
If yes, list additional resources needed. ☐ YES  
☒ NO
  
5. If this change affects other units of the University, include a statement signed by the chairperson(s) of the affected unit(s).
  
6. If cross-listed, provide evidence of approval by all curriculum committees appropriate to both the originating and cross-listed units.



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Approval signature of chairperson of originating unit

**UNDERGRADUATE COUNCIL**  
**Request for Change(s)**

Originating unit requesting change Department of Computer Science

Type of Change requested:

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Course number(s)   | <input type="checkbox"/> Course prerequisite(s) | <input type="checkbox"/> Program description             |
| <input type="checkbox"/> Course title       | <input type="checkbox"/> Drop course(s)         | <input checked="" type="checkbox"/> Program requirements |
| <input type="checkbox"/> Course description | <input type="checkbox"/> Drop program(s)        |  |

Semester and year change(s) take effect: Fall 2022

Appropriate computer abbreviation if  
course title is more than 30 spaces:

Briefly summarize the change requested:

Change the requirements of the CITE major. Drop COSC 30203 (Computer System Fundamentals) and CITE 30153 (Interface & Scripting Fundamentals) as required courses. Add COSC 30003 (Introduction to Computer Networks) and COSC 40233 (Cloud Computing) as required courses.

**Programs Only** Program Name: Computer Information Technology

Current Code: \_\_\_\_\_ Proposed New Code (list 2): \_\_\_\_\_ or \_\_\_\_\_  
(ex: INDE-BFA)

Can have second major: \_\_\_\_ Yes \_\_\_\_ No

Current 6-digit CIP Code: \_\_\_\_\_

Does the change require a new or change in CIP code? \_\_\_\_ Yes \_\_\_\_ No

If yes, what is the proposed 6-digit CIP code? \_\_\_\_\_

\*for reference, please visit: <https://nces.ed.gov/ipeds/cipcode/resources.aspx?y=56>

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### Catalog copy

Present catalog copy (paste-up from catalog is acceptable).	Proposed change(s). (Include exact catalog copy as desired. Underline changes)
The program of study requires of 45 hours, on a 124-hour degree, consisting of:	The program of study requires of 45 hours, on a <u>120</u> -hour degree, consisting of:
Core Courses	Core Courses
COSC 10403 Introduction to Programming	COSC 10403 Introduction to Programming
COSC 20203 Techniques in Programming	COSC 20203 Techniques in Programming
COSC 20803 Data Structures	COSC 20803 Data Structures
COSC 30203 Computer System Fundamentals	<u>COSC 30003 Introduction to Computer Networks</u>
...	...
CITE 30153 Interface & Scripting Fundamentals	<u>COSC 40233 Cloud Computing</u>
...	...

### 1. What is the justification for the change(s) requested?

Replacing COSC 30203 and CITE 30153 with COSC 30003 (Introduction to Computer Networks) and COSC 40233 (Cloud Computing) will better prepare CITE majors for their future careers in information technology.

### 2. If applicable, explain how the change(s) will affect the current program outcomes and assessment mechanisms.

N/A

### 3. **Faculty Resources:** How will the unit provide faculty support for this change and any other impact this change may have on other current departmental listings.

N/A



4. **Educational Resources:** Will this change require additional resources not currently available (e.g. space, equipment, library, other)? ☐ YES  
If yes, list additional resources needed. ☒ NO

5. If this change affects other units of the University, include a statement signed by the chairperson(s) of the affected unit(s).
6. If cross-listed, provide evidence of approval by all curriculum committees appropriate to both the originating and cross-listed units.

*Donnell Payne*

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Approval signature of chairperson of originating unit

# UNDERGRADUATE COUNCIL

## Request for New Course

Originating unit requesting course: \_\_\_\_\_ Computer Science

New course title: \_\_\_\_\_ Introduction to Computer Networks

New course number: \_\_\_\_\_ COSC 30003

Appropriate computer abbreviation if title is more than 30 spaces: \_\_\_\_\_ Intro to Computer Networks

Prerequisites for new course:

CITE 30103

Effective date for course (semester and year): \_\_\_\_\_ Fall 2022

Instructional methodology (Click in box to the left of the name to select a course type.)

(See departmental chairperson or deans for definition of type.):

- |                                      |   |   |                                       |
|--------------------------------------|---|---|---------------------------------------|
| <input type="checkbox"/> activity    | <input type="checkbox"/> clinical           | <input type="checkbox"/> directed study           | <input type="checkbox"/> internship   |
| <input type="checkbox"/> laboratory  | <input checked="" type="checkbox"/> lecture | <input type="checkbox"/> lecture w/integrated lab |                                       |
| <input type="checkbox"/> performance | <input type="checkbox"/> research           | <input type="checkbox"/> seminar                  | <input type="checkbox"/> study abroad |

Description of new course (as it will appear in catalog copy):

COSC 30003 – Introduction to Computer Networks (3)

Prerequisites: COSC 30103

Study of the technology, architecture, and software used by systems of network-connected computers. Topics include data transmission, local area network architectures, network protocols, inter-networking, distributed systems, security, and network applications such as email, WWW, and FTP. Students will develop programs that run concurrently on multiple computers.

**1. Submit a representative course syllabus that includes the following:**

- a. A concise course description including the course purpose (e.g. fulfill part of university, college, or department mission, discipline requirement, program enrichment, etc.) and course instructional methodology (e.g. lecture, laboratory, lecture and laboratory, clinical, internship, etc.)
- b. the goals of the course;
- c. a clear statement of course expectations - essentially, what students shall be expected to do in order to satisfactorily complete the course at different performance levels (generally speaking, what does it take to get an A, B, C, etc.?);
- d. a statement of the faculty member's policies on attendance, make-up work, missed exams, etc;
- e. information concerning major projects or papers and when these assignments must be completed by the students;
- f. information about the number and dates of the exams;
- g. statements reflecting TCU policy regarding accommodations under Americans with Disabilities Act (ADA) ([this disabilities statement](#) MUST be included *verbatim*) and university policy regarding academic misconduct ([this statement](#), while not required, may be used); and
- h. a statement indicating how the instructor can be reached and how office hour requirements will be met.

A [syllabus template](#), which includes these required elements and others, is available from the Koehler Center.

**2. Faculty Resources: How will the unit provide faculty support for this course?**

**Describe how this course will impact other current departmental listings.**

The department plans to offer this new course every year. One Computer Science professor with experience in this domain has taught this course as an elective during Fall 2021. The feedback from students is very positive and many students suggest the department offering this course regularly. The course can be used as an elective course for both COSC and CITE majors provided they have the prerequisites. The addition of this new course introduces our students to various career pathways and will better prepare them for starting a career in the cloud.

**3. Educational Resources: Will this course require additional resources not currently available (e.g., space, equipment, library)?**☐

Yes

☒

No

**4. If this course affects other units of the University, include a statement signed by chairperson of the affected unit(s).****5. If cross-listed, provide evidence of approval of all curriculum committees appropriate to both the originating and cross-listed units.****6. If this course is to be delivered online, include a letter from the Koehler Center stating that program administrators and identified faculty are working with the Koehler Center to fulfill TCU Distance Learning requirement.**

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Approval signature of chairperson of originating unit

# UNDERGRADUATE COUNCIL

## Request for New Course

Originating unit requesting course: \_\_\_\_\_ Computer Science

New course title: \_\_\_\_\_ Cloud Computing

New course number: \_\_\_\_\_ COSC 40233

Appropriate computer abbreviation if  
title is more than 30 spaces: \_\_\_\_\_

### Prerequisites for new course:

CITE 30103 and completed at least 18 hours in the major.

Effective date for course (semester and year): \_\_\_\_\_ Fall 2022

Instructional methodology (Click in box to the left of the name to select a course type.)

(See departmental chairperson or deans for definition of type.):

- |                                      |   |   |                                       |
|--------------------------------------|---|---|---------------------------------------|
| <input type="checkbox"/> activity    | <input type="checkbox"/> clinical           | <input type="checkbox"/> directed study           | <input type="checkbox"/> internship   |
| <input type="checkbox"/> laboratory  | <input checked="" type="checkbox"/> lecture | <input type="checkbox"/> lecture w/integrated lab |                                       |
| <input type="checkbox"/> performance | <input type="checkbox"/> research           | <input type="checkbox"/> seminar                  | <input type="checkbox"/> study abroad |

### Description of new course (as it will appear in catalog copy):

COSC 40233 – Cloud Computing (3)

Prerequisites: CITE 30103 and completed 18 hours in the major.

This is an introductory course on Cloud Computing. The course will provide a detailed overview and help students get an overall understanding of cloud computing concepts. More specifically, students will get hands-on exposure to the AWS cloud, including but not limited to the AWS core services, security, and architecture.

**1. Submit a representative course syllabus that includes the following:**

- a. A concise course description including the course purpose (e.g. fulfill part of university, college, or department mission, discipline requirement, program enrichment, etc.) and course instructional methodology (e.g. lecture, laboratory, lecture and laboratory, clinical, internship, etc.)
- b. the goals of the course;
- c. a clear statement of course expectations - essentially, what students shall be expected to do in order to satisfactorily complete the course at different performance levels (generally speaking, what does it take to get an A, B, C, etc.?);
- d. a statement of the faculty member's policies on attendance, make-up work, missed exams, etc;
- e. information concerning major projects or papers and when these assignments must be completed by the students;
- f. information about the number and dates of the exams;
- g. statements reflecting TCU policy regarding accommodations under Americans with Disabilities Act (ADA) ([this disabilities statement](#) MUST be included *verbatim*) and university policy regarding academic misconduct ([this statement](#), while not required, may be used); and
- h. a statement indicating how the instructor can be reached and how office hour requirements will be met.

A [syllabus template](#), which includes these required elements and others, is available from the Koehler Center.

**2. Faculty Resources: How will the unit provide faculty support for this course?**

**Describe how this course will impact other current departmental listings.**

The department plans to offer this new course every year. One Computer Science professor with experience in this domain has taught this course as an elective during Fall 2021. The feedback from students is very positive and many students suggest the department offering this course regularly. The course can be used as an elective course for both COSC and CITE majors provided they have the prerequisites. The addition of this new course introduces our students to various career pathways and will better prepare them for starting a career in the cloud.

**3. Educational Resources: Will this course require additional resources not currently available (e.g., space, equipment, library)?**☐

Yes

☒

No

4. **If this course affects other units of the University, include a statement signed by chairperson of the affected unit(s).**
5. **If cross-listed, provide evidence of approval of all curriculum committees appropriate to both the originating and cross-listed units.**
6. **If this course is to be delivered online, include a letter from the Koehler Center stating that program administrators and identified faculty are working with the Koehler Center to fulfill TCU Distance Learning requirement.**



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Approval signature of chairperson of originating unit

# UNDERGRADUATE COUNCIL

## Request for New Course

Originating unit requesting course: Department of Engineering

New course title: Mechatronics

New course number: ENGR 40444

Appropriate computer abbreviation if title is more than 30 spaces: \_\_\_\_\_

Corequisites for new course:

ENGR 30444 Electronics I

Effective date for course (semester and year): Fall 2022

Term typically offered: Fall semester every other year

Instructional methodology (Click in box to the left of the name to select a course type.)  
(See departmental chairperson or deans for definition of type.):

- |  |   |   |                                       |
|--|---|---|---------------------------------------|
| <input type="checkbox"/> activity              | <input type="checkbox"/> clinical           | <input type="checkbox"/> directed study           | <input type="checkbox"/> internship   |
| <input checked="" type="checkbox"/> laboratory | <input checked="" type="checkbox"/> lecture | <input type="checkbox"/> lecture w/integrated lab |                                       |
| <input type="checkbox"/> performance           | <input type="checkbox"/> research           | <input type="checkbox"/> seminar                  | <input type="checkbox"/> study abroad |

Description of new course (as it will appear in catalog copy):

Prerequisites: ENGR30444 or concurrent.

**Fundamentals of microcontroller-based mechatronics systems, as well as control and characterization of a variety of transducers. An Arduino microcontroller platform is used. Design, prototype, and characterization of various mechatronic systems conducted in lab.**

**1. Submit a representative course syllabus that includes the following:**

- a. A concise course description including the course purpose (e.g. fulfill part of university, college, or department mission, discipline requirement, program enrichment, etc.) and course instructional methodology (e.g. lecture, laboratory, lecture and laboratory, clinical, internship, etc.)
- b. the goals of the course;
- c. a clear statement of course expectations - essentially, what students shall be expected to do in order to satisfactorily complete the course at different performance levels (generally speaking, what does it take to get an A, B, C, etc.);
- d. a statement of the faculty member's policies on attendance, make-up work, missed exams, etc;
- e. information concerning major projects or papers and when these assignments must be completed by the students;
- f. information about the number and dates of the exams;
- g. statements reflecting TCU policy regarding accommodations under Americans with Disabilities Act (ADA) ([this disabilities statement](#) MUST be included *verbatim*) and university policy regarding academic misconduct ([this statement](#), while not required, may be used); and
- h. a statement indicating how the instructor can be reached and how office hour requirements will be met.

**2. Faculty Resources: How will the unit provide faculty support for this course?**

**Describe how this course will impact other current departmental listings.**

Current faculty will teach this new course. It will be one of the engineering electives available to both electrical and mechanical emphasis students. It has been taught before as ENGR40970 Special Topics course.

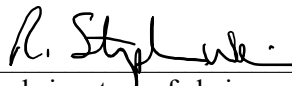
**3. Educational Resources: Will this course require additional resources not currently available (e.g., space, equipment, library)?      Yes**

The resources that will be required include an Arduino with a sensor/actuator kit per group. Additional hardware up to ~\$50 per group may include additional materials or transducers, depending on their project type.

In addition, we will be utilizing the 3D printing services in the lab for enclosures and PCB orders for each group (This will be limited to ~\$75 per group).

**4. If this course affects other units of the University, include a statement signed by chairperson of the affected unit(s).**

No.

**5. If cross-listed, provide evidence of approval of all curriculum committees appropriate to both the originating and cross-listed units.**

Approval signature of chairperson of originating unit

## GRADUATE COUNCIL: PROPOSAL FOR CHANGE IN EXISTING COURSE/PROGRAM

### Originating Unit

**Type of action:**      change in course      change in program

### Type of change requested:

Number

Course Title

Description

Prerequisite(s) Program

Drop Course

Requirements

Drop Program\*

Other, please specify

*\*A SACSCOC Drop Program Justification form will need to be completed*

### Semester and year course/program will take effect:

### Course instructional methodology:

course component types: [ugradcouncil.tcu.edu/forms/Course Component Types.pdf](http://ugradcouncil.tcu.edu/forms/Course%20Component%20Types.pdf)

Current name:

Proposed name:

Appropriate computer abbreviation (30 spaces or less):

### ***Programs Only***

Current program code:

(ex:EDCE-PHD)

Proposed code (list 2)

or

Current CIP code:

Does the change require a new or change in CIP code:      Yes      No

If yes, what is the proposed new CIP code:

\*for reference please visit: [nces.ed.gov/ipeds/cipcode/resources.aspx?y=56](http://nces.ed.gov/ipeds/cipcode/resources.aspx?y=56)

Is the program already considered TCU STEM:      Yes      No

Does the change include a request to be a TCU STEM program:      Yes      No



**Description of change** (omit if dropping a course or program):

**Present Catalog Copy**

**Proposed Catalog Copy:**

**Supporting evidence or justification:**

**Explain how the change(s) will affect the current outcomes and assessment mechanisms?**

**Additional resources required**

**Faculty:**

**Space:**

**Equipment:**

**Library:**

**Financial Aid:**

**Other:**

**Change in teaching load:**

**Does this change affect any other units of the University?   Yes      No**

If yes, submit supporting statement signed by chair of affected unit.

**If cross-listed, provide evidence of approval by all curriculum committees appropriate to both the originating and the cross-listed units.**

**Chair of Originating Unit:**

**Name:**

**Unit:**

**Signature:**

# **AGENDA**

## **Consent**

### **Department of Nutritional Sciences**

NTDT 60443 — change title & description

### **Department of Physics & Astronomy**

Biophysics BS — change requirements to match Biology change

Biophysics Minor — change requirements to match Biology change

## **Regular**

### **Department of Biology**

BIOL PhD — change requirements

BIOL 10523 — NSC proposal

### **Department of Computer Science**

CITE BS — change requirements

COSC 30003 — new course

COSC 40223 — new course

### **Department of Engineering**

ENGR 40444 — new course