



**Course Syllabus  
Projects in Engineering  
Fall 2021**

**Instructor:** Ms. Susie Cunningham  
**Email:** [scunningham@bsu.edu](mailto:scunningham@bsu.edu)  
**Office:** Elliott 007  
**Classrooms:** BU215 & BU219

**Office Hours:**

**Mondays:** Noon – 2:00 p.m. (in Elliott 007)  
8:00 p.m. – 10:00 p.m. (Via Zoom)

**Tuesdays:** Noon – 1:00 p.m. (in Elliott 007)  
3:00 – 4:00 p.m. (in BU215)

**Wednesdays:** Noon – 2:00 p.m. (in Elliott 007)

**Fridays:** Noon – 2:00 p.m. (in Elliott 007)

Other times for Office Hours may be arranged by appointment.  
Can also email me at any time.

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**Description:**

This course will provide students with an introduction to engineering as a profession through case studies and hands-on projects in several areas of engineering, including robotics. Students will work in teams, applying engineering principles, to build and test simple robots. Students will have the opportunity to participate in a robotics competition.

**Texts:**

Web Pages  
Hand-outs  
Manuals

**Course Methodology:**

Course methodology will include **hands-on activities, lectures, outside readings, classroom discussion, and projects**. Students will be **creating** various hands-on projects.

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### Student Evaluation:

There will be **9 discussion questions over engineering topics, 10 homework assignments, and 1 major final project.**

### Method of Grading:

Grades will be based on a point system.

	<u>Points</u>
Discussion Questions	45
Homework Assignments	90
Major Final Project	<u>100</u>
<b>Total Points</b>	<b>235</b>

Accumulated totals are then distributed into letter grades as follows:

<b>A</b>	<b>(93% - 100%)</b>
<b>A-</b>	<b>(90% - 92.9%)</b>
<b>B+</b>	<b>(88% - 89.9%)</b>
<b>B</b>	<b>(83% - 87.9%)</b>
<b>B-</b>	<b>(80% - 82.9%)</b>
<b>C+</b>	<b>(78% - 79.9%)</b>
<b>C</b>	<b>(73% - 77.9%)</b>
<b>C-</b>	<b>(70% - 72.9%)</b>
<b>D*</b>	<b>(69% and below)</b>

### Classroom Policies:

**Homework Assignments:** Homework assignments must be **turned in by the due date**. Assignments may be turned in earlier than the due date. **Any late homework will result in a reduced grade. (25% off for each day late.) Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday all count as days. A timeframe for a day constitutes from 12:01 a.m. – Midnight.**

**Absence prior to due Date:** Missing class (excused or not) prior to a test, or other due dates for homework assignments does not exempt the student from preparing and taking the test and/or submitting the required homework assignment on the due date. Exceptions may be granted in advance of class time and must be discussed with the instructor.

**Tardiness:** Students arriving more than 5 minutes late to class are marked tardy. Students arriving 20+ minutes late will be marked absent. **A student sleeping in class will be counted as an absence.**

**Academic Dishonesty:** (Refer to the Indiana Academy Handbook.)

In the event, a student turns in a computer program for a homework assignment or test that was not originally written by the student, the homework or test will fall under the category of plagiarism. This will be considered a **serious offense**. Students will be allowed to ask for help from other students if they are working on a preannounce group project or the student needs assistance finding a syntax error or minor errors.

If a student does use code in a programming homework assignment or project that was obtained from the Internet, another programming source, or writing code that is similar in nature, the student **must put in a comment in the computer program with the source of where the code was obtained, otherwise this will be considered under the category of plagiarism.**

Furthermore, if a student writes a computer program for another student, the student “knowingly permitting one’s work to be submitted by another person as if it were the submitter’s original work” will also be penalized.

Penalties will be assessed in accordance to the Indiana Academy Handbook.

**Communication:**

The best way to communicate with me is through email at [scunningham@bsu.edu](mailto:scunningham@bsu.edu). My phone dings when I receive an email and I can answer back via email through my phone. Generally, I do answer back almost immediately during work hours (unless I am teaching a course or on my way to class). I will always respond back within 24 hours. (This does include the weekends.) Generally, I am more available late at night. Office hours will be posted

**Diversity and Inclusion:**

Ball State University aspires to be a university that attracts and retains a diverse faculty, staff, and student body. We are committed to ensuring that all members of the community are welcome, through valuing the various experiences and worldviews represented at Ball State and among those we serve. We promote a culture of respect and civil discourse as expressed in our Beneficence Pledge and through university resources found at <http://cms.bsu.edu/campuslife/multiculturalcenter>.

**Accommodations:**

If you need course adaptations or accommodations because of a disability, please contact me as soon as possible. Ball State’s Disability Services office coordinates services for students with disabilities; documentation of a disability needs to be on file in that office before any accommodations can be provided. Disability Services can be contacted at 765-285-5293 or [dsd@bsu.edu](mailto:dsd@bsu.edu).

**Canvas Accessibility:**

Canvas provides a user experience that is easy, simple, and intuitive. Special attention has been paid to making Canvas screen-readable. The Rich Content Editor encourages users to create accessible content pages (i.e. text formatting is accomplished using styles). Canvas is designed to allow limited customization of colors and schemes to be accessible for all users. The National Federation of the Blind granted Canvas the Gold Level Web Certification in 2010.

Find more information by visiting the Canvas Voluntary Product Accessibility Template (VPAT) .  
<https://community.canvaslms.com/t5/Accessibility/Accessibility-within-Canvas/ba-p/261501>

**Indiana Academy Mask Policy:**

The Indiana Academy will follow [Ball State University’s mask policy](#) (see Section IV). Based on current CDC guidance recommending the wearing of face masks for all people—regardless of vaccination status—in public indoor settings in communities where the rate of coronavirus transmission is high or substantial, all employees, students, and campus visitors are required to wear a mask while inside any University building. This requirement is effective on August 9, 2021. Fully vaccinated people are not required to wear masks outdoors.

Individuals who are not fully vaccinated for COVID-19 are required to wear face masks while inside campus buildings and outside when physical distancing cannot be maintained.

If a student declines to wear a face mask as required, the student will be referred to the Director of Academic Affairs or the Director of Residential Affairs. If the situation occurs in a classroom or other academic setting, it is considered a classroom management issue, and the teacher will remind the student of the requirement and give the student a chance to comply with it prior to referring the matter to the Director of Academic Affairs or the Director of Residential Affairs. Wearing masks is crucial to preventing the spread of COVID-19 to others.

**Class Participation:** Unless instructed otherwise, students need to be working on items relating to the classroom homework/topic during the class time.



**Tentative Class Activity and Assignments  
Projects in Engineering**

**What is an Engineer?**

**Week of August 16, 2021:**

What is an engineer? How many types of engineers are there?

**HW #1 will be due on August 19, 2021 (5 pts.)**

**Mechanical and Software Engineering:**

**Week of August 23, 2021:**

Learn basics of mechanical engineering using a Mindstorms Lego Robotics kit.

**HW #2 will be due on August 30, 2021 (10 pts.)**

**Discussion Question #1 (5 pts.)**

**Mechanical and Software Engineering, cont.:**

**Week of August 30, 2021:**

Students will continue working on their projects and programming specific parts.

Students can continue with the Mindstorms Lego Robotics kit or change to using Tetrix or Vex Robotics kits.

**HW #3 will be due on September 1, 2021. (10 pts.)**

**Discussion Question #2 (5 pts.)**

**Chemical Engineering:**

**Week of September 6, 2021:**

(September 4th-7th is an extended weekend for Labor Day.)

Students will be given the opportunity to experience a simple hands-on task designed to demonstrate what a chemical engineer does. This task will be non-volatile.

**Discussion Question #3 (5 pts.)**

**Electrical Engineering:**

**Week of September 13, 2021:**

Students will be introduced to Arduinos.

**HW #4 will be due on September 20, 2021. (10 pts.)**

**Discussion Question #4 (5 pts.)**

### **Electrical Engineering, cont.:**

#### **Week of September 20, 2021:**

Students will continue working with Arduinos.

**HW #5 will be due on September 27, 2021. (10 pts.)**

**Discussion Question #5 (5 pts.)**

### **Civil and Industrial Engineering:**

#### **Week of September 27, 2021:**

Students will be introduced to a drafting package(s).

**HW #6 will be due on October 4, 2021. (10 pts.)**

**Discussion Question #6 (5 pts.)**

### **Civil and Industrial Engineering:**

#### **Week of October 4, 2021:**

Students will continue working on drafting project.

**Discussion Question #7 (5 pts.)**

### **Civil and Industrial Engineering, cont:**

#### **Week of October 11, 2021:**

(October 11<sup>th</sup> and 12<sup>th</sup> is an extended weekend for Fall Break.)

Students will finish drafting project.

**HW #7 will be due on October 15, 2021. (10 pts.)**

### **Aeronautical and Astronomical Engineer:**

#### **Week of October 18, 2021:**

Using Arduino programming in C++ and bread boards, students will learn basics of Aeronautical and Astronomical engineering.

**HW #8 will be due on October 21, 2021. (10 pts.)**

**Discussion Question #8 (5 pts.)**

### **Designing a Project:**

#### **Week of October 25, 2021:**

Students will design out a major project and subject it for approval.

**HW #9 will be due on October 29, 2021. (10 pts.)**

**Discussion Question #9 (5 pts.)**

#### **Weeks of November 1st, 8th, 15th and 29th 2021:**

Students will complete work on their major final projects.

**HW #10 will be due on November 17, 2021. (5 pts.) (Check point for Major Final Project.)**

#### **Week of November 22nd, 2021:**

Thanksgiving Break!

**Week of November 29, 2021:**

Students will make final revisions to their major projects.

**Week of December 6, 2021:**

Students will present their final major projects.

**ALL FINAL PROJECTS will be due on December 6, 2021! (100 pts.)**