Welcome to the College of Engineering!
The following guide is intended to help you determine which courses you should start with in your first semester at UHM. It will help you navigate the placement exams and give you an overview of the other general education and engineering requirements you will need to take as an engineering student. The College of Engineering (CoE) currently offers the following majors: Pre-Engineering (PREN), Civil Engineering (CE), Construction Engineering (CNST), Computer Engineering (CENG), Electrical Engineering (EE), Engineering Science (ENGS), and Mechanical Engineering (ME). The curriculum for each major can be found on the CoE website: https://www.eng.hawaii.edu/students/current-students/curriculum/.

Pre-Engineering students should use the curriculum of the engineering major they intend to declare. To declare, Pre-Engineering students will need to complete the Eng 100, Math 241 and 242, Chem 161/161L and 162, and Phys 170/170L and have an overall gpa of 3.0.

1. Placement Exams
   
   **Math Placement Exam**
   
   Information about how to take the math placement exam can be found at the following website.

   [https://math.hawaii.edu/wordpress/placement-exam/](https://math.hawaii.edu/wordpress/placement-exam/)

   **Who needs to take the math placement exam?**
   
   Math is very important towards making good progress in any engineering degree. Ideally, engineering freshmen should be starting with at least Calculus I (MATH 241) or higher in their first semester. Math 241 is one of the most important pre-requisites to the rest of engineering curriculum. Passing Math 241 allows students to move forward into the physics and the first engineering courses. All engineering students will need to finish the entire calculus series (Math 241-244 or Math 251A-253A) and so should be taking an appropriate level math course in the one of the following series. Student may place into their math course based on certain SAT, ACT, AP, and IB exam scores or by taking the math placement exam.

   The following pdf explains what the student may get credit for and/or what they can place into based on their scores in the SAT, ACT, AP, and IB exams. **If none of the those apply to you, you will need to take the math placement exam to determine which math class can start with in your first semester.**


   **Which math course should I take?**
   
   **Pre-calculus courses:** MATH 134 → Math 140 → start calculus series
   
   A student may start in pre-calculus if they do not place into calculus. If the student has not previously taken trigonometry or pre-calculus, they should start here to get a good foundation for calculus. A student
must place into Math 140 either through SAT/ACT scores or the math placement exam (BMAT score of 1 or 2). Passing Math 140 allows the student to take Math 241 the following semester. Math 134 does not require any placement exam (or BMAT score of 0), however, students are encouraged to try to place into Math 140 and take Math 134 if they do not place into Math 140.

**Standard 4 semester calculus series**: Math 241 → Math 242 → Math 243 → Math 244
Engineering students must successfully pass the full series of calculus as part of their curriculum. With a high enough score on the math placement (BMAT score of 3 or 4), SAT, ACT, or AP exams, students may start in one of the calculus courses. Do not take any other calculus courses like business calculus (Math 203) or applied calculus (Math 215) as they do not count towards the engineering degree. Unless the student plans to do the accelerated/honors calculus series (Math 251A-253A), they should take/earn credit for Math 241-244.

**Honors / Accelerated 3 semester calculus series**: Math 251A → Math 252A → 253A
Students who are in the honors program and/or feel confident in their math skills may try for the accelerated calculus series, Math 251A-253A. This accelerated series completes calculus in 3 semesters instead of 4 semesters. Students will need to place into this series with high scores (BMAT score of 4) on the placement exam or may interview with the math department. To enroll in Math 251A, students should contact the Math Director of Undergraduate Studies at (808)-956-4679 or office@math.hawaii.edu.

**Chemistry Placement Exam**
The chemistry placement exam is offered online and can be taken anywhere that the student has access to a computer and reliable internet connection. The student has two chances to pass the chemistry placement exam per semester. If the student does not pass the exam on the first try, they must wait at least 24 hours before trying again. Taking it before the 24 hour period is up will result in voiding the second chance. Information about the chemistry placement exam can be found at the following website.

http://manoa.hawaii.edu/chem/academics/undergraduate/placement-exam/

**Who needs to take the chemistry placement exam?**
All engineering students are required to finish Chem 161/161L and Chem 162 or the accelerated one semester equivalent, Chem 171/171L.

Unless students have AP credits for Chemistry as listed in the table below, they will need to take the Chemistry placement exam.

<table>
<thead>
<tr>
<th>Exam</th>
<th>Score</th>
<th>Course Credit</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP Chemistry</td>
<td>5</td>
<td>Chem 161/161L and 162</td>
<td>Student earns credit for <strong>Chem 161</strong> and <strong>Chem 162</strong> and will not need to take any further chemistry lecture courses.</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Chem 161/161L</td>
<td>Student earns credit for <strong>Chem 161</strong> and may register for <strong>Chem 162</strong> without the placement exam.</td>
</tr>
</tbody>
</table>

* Waiver of the required Chem 161L lab is determined by chemistry department. Students should bring their AP chemistry lab notebook to the chemistry department for review.
Which chemistry course should I take?

Chem 171 and 171L are highly recommended for engineering students if they place into it (score of 20/25 or better). However, if the student is planning to go onto medical school they will need to take the Chem 161/161L and Chem 162/162L.

Chem 161 and 161L are recommended if the student scores 16/25 or better.

Chem 131 is recommended for students who score between a 8/25 - 15/25. Although Chem 131 is not required for the engineering degree, passing it with a C or better will allow the student to then take Chem 161/161L. Chem 131 does not have an associated lab.

Students who score lower than 8/25 will need to review their math skills before retaking the placement.

2. AP Exam Credit

The linked pdf below explains what the student may get credit for based on their AP exam scores. Math and Chemistry AP exam credits are explained in the previous placement exams sections.

https://manoa.hawaii.edu/admissions/pdf/AP.pdf

3. UHM General Education Requirements:

There are four types of UHM general education requirements that are required for all students graduate.

1. Foundation
2. Diversification
3. Focus
4. Hawaiian or Second Language *(waived for engineering students)*

For more information of any of the general education requirements, please visit the catalog website.

https://manoa.hawaii.edu/catalog/undergrad/undergrad-requirements/

The following sections describe the requirements as they work with the different engineering curricula.

Foundation Requirements:

- 3 credits of Foundation Writing (FW): To be fulfilled by ENG 100
- 3 credits of Foundation Quantitative Reasoning (FQ): To be fulfilled by MATH 241, 251A, or 140
- 6 credits of Foundation Global and Multicultural Perspectives (FG):
  To fulfill this requirement, students must take a total of six credits (2 courses); the 2 courses must come from different groups. These can be searched in the STAR GPS registration system by using the Global Multicultural Perspectives course. Otherwise, a list of the 3 different FG group courses may be found at the following website. https://manoa.hawaii.edu/catalog/undergrad/undergrad-requirements/
**Diversification Requirements:**

- **Social Sciences (DS): 6 credits**
  Students need 2 social science (DS) courses to graduate. The College of Engineering already requires engineering students to take any one of ECON 120, 130, or 131 which fulfills one of the DS requirements. The other DS course must be from a different subject which means a DS that is not another ECON course.

- **Arts, Humanities, and Literature (DA, DH, DL): 6 credits**
  Students must take two of the three different areas: Arts (DA), Humanities (DH), and Literatures (DL). The College of Engineering already requires engineering students to take COMG 251 which fulfills the DA. To fulfill the rest of the requirement, students will need to take either a DH or DL course.

- **Natural Sciences (DB, DP and DY): 7 credits**
  All engineering majors have enough required courses (physics, chemistry, etc.) that will fulfill the natural science requirements. The DB is not required for engineering students although the CE and CNST degrees require biological science electives that can only be fulfilled by approved courses as shown on their check sheets. ([https://www.eng.hawaii.edu/students/current-students/curriculum/](https://www.eng.hawaii.edu/students/current-students/curriculum/))

**Focus Requirements:**

- **Hawaiian, Asian, and Pacific Issues (H or HAP): 1 course**
  All engineering students must do an H focus course of their choice. Some popular options include:
  
  - HWST 107 (H, DH)
  - PACS 108 (H, DS)
  - LING 150B (H, DS) or LING 150C (H, DS, W)

- **Contemporary Ethical Issues (E or ETH): 1 course, 300 or 400 lvl**
  All engineering students have an E focus course already required in their curriculum and will fulfill this requirement as they complete engineering courses needed for the degree.

- **Oral Communication (O or OC): 1 course, 300 or 400 lvl**
  All engineering students have an O focus course already required in their curriculum and will fulfill this requirement as they complete engineering courses needed for the degree.

- **Writing Intensive (W or WI): 5 courses, at least 2 at 300 or 400 lvl**
  Civil, Computer, and Mechanical engineering students have all 5 WI courses built into their curriculum and will fulfill this requirement as they complete the degree.
  Construction Engineering and Engineering Science students have 4 W courses built into their curriculum and should consider taking 1 WI course of their choice (can be lower division).
  Electrical engineering students have at least 2-3 W courses required in the curriculum. It is sometimes possible to get all 5 W courses out of the upper division courses but it is recommended that EE students consider doing 1 or 2 W courses of their choice (can be lower division).

**Hawaiian or Second Language requirement (HSL) is waived for all engineering students.**

All engineering students do not have to take a second language.
4. Which courses should you be taking in your first semester?

The College of Engineering has curriculum check sheets for each major to help track your progress through the engineering program. The entire curriculum including the general education is sequenced out into a 4 year plan (if starting in Math 241). If starting in Math 140 or Math 134, the time to graduation will be 4.5 – 5 year plan with potential to speed up with summer school in the first summer. The check sheets may be found on the college website.  https://www.eng.hawaii.edu/students/current-students/curriculum/

Math (3 or 4 credits) - Based on placement exam or other scores, students choose an appropriate math class.

Chem 161 and 161L (3 + 1 credits) – Passing the chemistry placement exam allows students to register for Chem 161 and 161L or Chem 171 and 171L. If a student does not pass the placement, they may consider Chem 131.

Eng 100 (3 credits) – English 100 is only open to freshmen at UHM. Students must complete Eng 100 in the freshman year or they will need to take it during summer school or at a community college. If the classes fill up in the fall semester, students can take it in the spring semester of their freshmen year instead. Taking Eng 100 in the spring will not extend time to graduation.

The general education courses are also good options (see above section for more details):

- FG courses
- COMG 251 (DA)
- any one of Econ 120, 130, or 131 (DS)
- H focus course

Students will need at least 12 credits to be considered fulltime. We recommend that incoming students prioritize taking the highest math and chem they placed into and then add the Eng 100 and/or the other general education courses to get to a total of 12-15 credits in their first semester so that they have time to adjust to college.