

**University of Central Oklahoma**  
**Department of Physics and Engineering**  
**Advisement for Engineering Physics and Biomedical Engineering**

The following document is intended to help with advisement for the Engineering Physics (EP) and Biomedical Engineering (BME) programs at UCO. Note you should only be viewing this page if you have already submitted what courses you have taken using the on-line advisement form. Once the on-line advisement form has been submitted, then you should read this document to help with advisement. The following advisement information is divided into sections such as Math, Physics, and Engineering. Part of the purpose of requiring you to read this before coming into advisement is to get you to think about what you need to be doing not just for the next semester but the one after and for the next year as well.

### **Math Courses**

Proper preparation in math is extremely important to succeeding in physics and engineering. This discipline helps provide the tools you will need like algebra, differentiation, integration, and trigonometry that come up in solving many physics and engineering problems. Check out the flowchart to see when it is expected you should have particular math courses. Note that College Algebra and Plane Trigonometry are considered “Support Courses”, which means if you need to take these courses it is imperative that you take them as soon as possible. Ideally you are ready to go directly into Calculus I, which turns out to be a prerequisite for Physics for Scientists and Engineers I (PSE I). Once you are in the Calculus sequence things need to progress every semester by taking the next Calculus course or Differential Equations. The reason is that we require that you take Calculus I through Calculus IV and Differential Equations. This amounts to 15 hours of math that will take 2.5 years to complete. Not to mention that many of the physics and engineering courses you need to take have these math courses as prerequisites. Mathematics deficiencies exist when the following condition is met:

New students admitted Fall 1988 or later, who have not completed the High School Core in Mathematics (3 years of High School Math, including Algebra II, OR scored an 18 or below on the Math subsection of the ACT exam, have a Mathematics Deficiency.

If you happen to fit into this category you will need to visit with a UCO advisor in NUC 121. The phone number for the Advising office is 974-3338 and the web-site may be found at:

<http://www.registrar.ucok.edu/admissions/admit.html#advisement>

If you do not fit into the deficiency category, then you need to look at Table One to see what math course you will need to take. Basically we would like to see you get into Calculus 1 as soon as possible, but only when you are prepared.

Table 1 UCO Engineering Physics and Biomedical Engineering first math course matrix.

<b>Highest Math Taken in High School</b>	<b>First Semester College Math Course to Take</b>
Algebra 2	Take either MATH 1513 College Algebra or MATH 1593 Plane Trig. <u>Speak with P&amp;E Faculty Advisor.</u>
Trigonometry	Take MATH 2313 Calculus 1. If you believe you have a deficiency in either algebra or trig., then <u>Speak with P&amp;E Faculty Advisor.</u>
Pre-Calculus	Take MATH 2313 Calculus 1.
AP Calculus	Take either MATH 2313 Calculus 1 or MATH 2323 Calculus 2. You will need to <u>Speak with P&amp;E Faculty Advisor</u> , but generally you need to have scored very well on the AP Calculus Exam to not take Calculus 1.

Once you have begun the math sequence (see the Engineering Physics Flowchart) it cannot be stressed enough that you should then take required math courses in consecutive semesters so that you will meet the prerequisites for physics and engineering courses.

### Physics Courses

As you can see on the Engineering Physics Flowchart you will need to get into PHY 2014 Physics for Scientists and Engineers I and Lab (PSE 1 for short) as soon as possible. The requirements to enter this course is three-fold: have taken MATH 2313 Calculus 1, have taken a previous physics course in either high school or college, are currently enrolled in MATH 2323 Calculus 2. If you took a physics (**NOT PHYSICAL SCIENCE**) course in high school, then the second requirement is met. If you took either PHY 1003 Introduction to Physics or PHY 1104 General Physics I and Lab, then the second requirement is met. If you have not done either of these two, then you will need to take PHY 1003 Introduction to Physics to get a conceptual background before you dive into PSE 1. The following table summarizes the beginning of the physics sequence.

Table 2 UCO Engineering Physics and Biomedical Engineering first physics course matrix.

<b>Physics Course Background</b>	<b>First College Physics Course to Take</b>
No physics course ever taken.	Take PHY 1003 Introduction to Physics.
High school physics taken.	Take PHY 2014 PSE 1 (assuming math prerequisites are met).
AP High School Physics taken.	If you scored extremely well (i.e. 5) on the Calculus-based AP Physics Exam, then you might be able to skip PHY 2014 PSE 1, but make sure you <u>Speak with P&amp;E Faculty Advisor</u> to determine your eligibility to do this.

You should note that PSE 1 requires that you should be taking MATH 2323 Calculus 2 at the same time as PSE 1 or have taken it previously. Also note that PHY 2114 PSE 2 requires that you have taken PSE 1 and that have previously taken MATH 2333 Calculus 3 or are co-enrolled in MATH 2333. Following the completion of PSE 2 you will need to take PHY 3104 Modern Physics and Lab. Currently this course is offered only once per year in the Spring (see flowchart) and you should plan your schedule accordingly.

## **Engineering Courses**

It is very likely that you are currently enrolled in ENGR 1111 Introduction to Engineering and this is the first course you should take in the Engineering Physics curriculum. This course helps you get oriented towards engineering and the Engineering Physics and Biomedical Engineering Programs at UCO. There are no prerequisites for Intro to Engineering.

The next course in the sequence is ENGR 1213 Engineering Physics Computing (EPC) which helps you learn to use some basic computing and calculating tools that will be necessary in your engineering curriculum (see the ENGR courses page for a full course description). You need to either have completed MATH 1593 Plane Trigonometry or be co-enrolled in MATH 1593 to be in EPC. Although it is not a requirement, many students take ENGR 1213 EPC the semester after ENGR 1111. Note that ENGR 1213 EPC is currently offered only once per year in the Spring.

As you can see on the Engineering Physics Flowchart the first *Engineering Science* course you will take is ENGR 2033 Statics. Statics requires that you have taken PHY 2014 PSE 1 and MATH 2333 Calculus 3. Note that you can take Calculus 3 at the same time as Statics.

By the time you have taken ENGR 2033 Statics you are likely to know a little more of what you are doing in terms of scheduling, but you are still required to see a Physics and Engineering Faculty Advisor every semester to enroll. This is to ensure that your progress through the EP and BME programs is monitored and you given the best possible advice to help you progress.

ENGR 3063 Dynamics should follow Statics. Although the prerequisites do not currently read this way (they will next year) you should have completed ENGR 2033 Statics before taking ENGR 3063 Dynamics.

## **Final Advising Note**

One last note is that the EP and BME programs are undergoing some changes to make them even more rigorous than they already are. As a result you can expect that a few things will change in these programs while you are here at UCO. One thing that can change are the prerequisites for certain courses. So you will need to stay aware of these changes as they occur. The Faculty of the Physics and Engineering Department are committed to making the programs stronger and also in guiding you through the programs. Please keep this fact in mind as you have difficulties in your coursework – high level coursework in physics and engineering is challenging to almost all students, but the rewards in terms of understanding and in terms of skills gained in these curricula are well worth the investment you are making now.