Point Loma Nazarene University

EGR 110-01: COMPUTATIONAL METHODS FOR ENGINEERS AND SCIENTISTS I   1 Unit   Course Syllabus, Fall 2017

Instructor: Christopher T. Gabler
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Office hours: MWF: 10:00-11:30 am
Phone: Cell: 858-354-8762
Class Meeting Time and Place: RS 219: 9:30- 11:25 TR
(1st Day of class 8/31/2017)

PLNU *forward*

PLNU Mission

To Teach ~ To Shape ~ To Send

University Mission:
Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith.   Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Department Mission: The Physics and Engineering Department at PLNU provides strong programs of study in the fields of Physics and Engineering. Our students are well prepared for graduate studies and careers in scientific and engineering fields. We emphasize a collaborative learning environment which allows students to thrive academically, build personal confidence, and develop interpersonal skills. We provide a Christian environment for students to learn values and judgment, and pursue integration of modern scientific knowledge and Christian faith.

COURSE DESCRIPTION

 An introduction to techniques used in scientific analysis, including graphing of data, curve fitting, numerical methods of problem solution, error analysis, and the use of computers for solving problems in physics and engineering. Three hours laboratory each week.   Offered on a Quad basis.

Materials:
For this course, you will need a scientific calculator. The minimum requirements of this calculator include trig functions, inverse trig functions, log, ln, and exponential functions.
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Materials:
Two variate statistical functions (linear regression analysis) would also be very useful to have. You will also need to operate a personal computer using MS Excel. Excel is available on most campus computers. **Textbook:**   Reading materials will be provided on Canvas.

COURSE LEARNING OUTCOMES
In this course there are a number of specific goals for you to meet from each chapter. These smaller goals fit into the following overall course learning objectives. Once you complete this course, you should be able to:
1. Translate the description of physics problems into the mathematical equations required to solve the problems using relevant physical principles
2. Calculate solutions to physics problems once appropriate equations or techniques are identified
3. Predict reasonable answers in appropriate problems, and assess the reasonableness of calculated answers
4. Explain the physical meaning of the parameters in introductory physics equations
5. Create and interpret graphical representations of physical quantities
6. Gather and interpret data in a lab setting

Class Enrollment: It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of F on the official transcript.

Class Meetings: Learning computational methods requires active learning and participation during class. In preparation for each class meeting there is a reading assignment. To maximize your learning and participation during our meetings it is very important that you have read this material before class.

Technology, devices and classroom participation policy: For my lecture classes, use of computers such as notebooks, iPads, and similar devices shall be used just for class activities, PowerPoint, etc. Use of extra-curricular apps on smartphones such as texting and social media needs to be closed such that it does not disrupt or distract the classroom environment, classmates or the instructor.   Please be professional and courteous in this area of your use of technology in the classroom.

Credit Hour: In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for a 1 unit class delivered over 8 weeks. Specific details about how the class meets the credit hour requirements can be provided upon
request.

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CANVAS and COURSEWORK:
The online resource Canvas is integral for this course, and you are expected to login regularly. You need a reliable internet connection to be able to use this resource.

Attendance and participation Policy: Attendance is expected at each class session. In the event of an absence you are responsible for the material covered in class and the assignments given that day. Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in disenrollment.
If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Class_Attendance in the Undergraduate Academic Catalog.

ASSESSMENT AND GRADING
Homework: Homework is due roughly each lecture. Homework is worth 40% of your final grade. Practicing working problems is critical to your success in the class, and completing this practice on time is important. Late work receives a 10% reduction in possible value per day.

> *Collaboration:* I expect and encourage collaboration between you and your peers while working on your homework. (Most good ideas come out of discussions with colleagues. This skill is highly valued by employers, and virtually all science and engineering takes place within groups or teams.) That being said, your work should be your *own original solution*.
> Allow adequate time to work and think about problems by yourself first before you work together with your peers or ask questions of me.

Late Work: I generally do not accept late work unless there is a documented emergency. If late work is submitted, the following applies in **late submission:** Up to one late assignment per quad will be accepted late with a 10% reduction in grade for every day it is late. This begins with a 10% reduction for an assignment turned in later in the day after this homework has been collected at the beginning of class.

Exams: There are two in-class exams; each is worth 15% of your grade. There is also a comprehensive final exam on the last day of quad 1 class. Exams are to be taken at the time indicated in the syllabus unless other arrangements are made in advance with the professor for some unavoidable circumstance, and otherwise cannot be made up. You must take ALL the quizzes and exam to pass the class.

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Policy for missed exams: Unless you have express written permission from me long before the date of the exam to take the exam on another day, there will be no makeup exams for this course.

Final Exam: The Final Exam is scheduled for the Quad II version of the course, EGR 120. The final exam date and time is set by the university at the beginning of the semester and may not be changed by the instructor. This schedule can be found on the university website and in the course calendar. No requests for early examinations will be approved. Only in the case that a student is required to take three exams during the same day of finals week, is an instructor authorized to consider changing the exam date and time for that particular student.

Final Grade: The grade you earn in this course is based on the scale shown below. The points you receive during the course are weighted accordingly:

- Homework/In Class Problems: 40%
- Tests (3): 30%
- Final Exam: 30%.

The grade you earn in this course is based on the following scale:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-
100-92	92-89.5	89.5-87	87-82	82-79.5	79.5-77	77-72	72-69.5	69.5-67	67-62	62-59.5

Class Schedule:

August 31	Introduction / Graphing (Chapter 1)
September 5	Graphing II/ Excel
September 7	Data Scatter/ Empirical Equations (Chapter 2)
September 12	Linear Regression Analysis (Chapter 3)
September 14	Data Import/Linear Regression Analysis (Chapter 3)
September 19	Test 1 over Chapters 1-3
September 21	Vocations / Approximate Solutions (Chapter 4)
September 26	Approximate Solutions (Chapter 4) Continued
September 28	Numerical Integration (Chapter 5)

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September 29	Vocation Talks / Numerical Integration (Chapter 5)
October 3	Test 2 over Excel and Chapters 4 and 5
October 5	Taylor Series (Chapter 6)
October 10	Taylor Series and Models (Chapter 6) Continued
October 12	Comprehensive Final Exam

PLNU ACADEMIC HONESTY POLICY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Honesty for definitions of kinds of academic dishonesty and for further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the first two weeks of class to demonstrate need and to register for accommodation by phone at 619-849-2486 or by e-mail at DRC@pointloma.edu. See Disability Resource Center for additional information. For more details see the PLNU catalog: http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Accommodations. Students with learning disabilities who may need accommodations should discuss options with the instructor during the first two weeks of class.

PLNU COPYRIGHT/PROTECTED MATERIALS POLICY

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

FERPA POLICY

In compliance with federal law, neither PLNU student ID nor social security number should be used in publicly posted grades or returned sets of assignments without student written permission. This class will meet the federal requirements by (Note: each faculty member should choose one strategy to use: distributing all grades and papers individually; requesting and filing written student permission; or assigning each student a unique class ID number not identifiable on the alphabetic roster.). Also in compliance with FERPA, you will be the only person given information about your progress in this class unless you have designated others to receive it in the "Information Release" section of the student portal. See Policy Statements in the (undergrad/ graduate as appropriate) academic catalog.