COMPUTATIONAL METHODS FOR ENGINEERS AND SCIENTISTS II
EGR 120 – 1 unit, Fall 2016

Department of Physics and Engineering, Point Loma Nazarene University

Professor: Christopher Gabler
Office: Rohr Science 209 Phone: 619-849-2356 E-mail: ChrisGabler@pointloma.edu
Office Hours RS209: MW 2:00 – 3:30 pm, T 2:30 – 12:30 pm,
R 9:00 – 10:15 am; or by appointment

Teaching Assistant: Dallas Probert Email: rdprobert025@pointloma.edu

Meeting Times: Lecture: T/R 11:00 am – 12:15 pm (RS 13)

University Mission: To Teach ~ To Shape ~ To Send. As with all courses at PLNU, this course supports the cause 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.
Within this broader 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.

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Materials: MATLAB student edition

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.

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Attendance and Participation: 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 de-enrollment. 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 Academic Policies in the Undergraduate Academic Catalog. See http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Class Attendance in the Undergraduate Academic Catalog.

Course Description: Engineering and scientific computing utilizing MATLAB software. Examples and applications taken from the fields of engineering, physics, chemistry, and biology. Three hours laboratory each week.

Necessary Equipment: For this course, you will need a laptop computer, as well as a scientific calculator. The minimum requirements of this calculator include trig functions, inverse trig functions, log, ln, and exponential functions. Two variate statistical functions (linear regression analysis) would also be very useful to have. You will also need to operate a personal computer using the Student Version of MATLAB.

Course Learning Outcomes: This course supports the departmental learning outcomes in that you will better be able to: apply physical principles, mathematical reasoning, and computational techniques to solve real-world problems and to effectively communicate complicated technical information.

Specifically, as a result of this course you will

1. acquire skills to learn how to develop solutions for certain kinds of physics and engineering problems using computational techniques
2. become proficient at using MATLAB including writing .m files and correcting or modifying existing code.
3. develop skills at communicating technical information

Projects: Through the class you will be completing six different projects along with a final project. These projects are to be typically submitted each week by Thursday evening in the form of web pages which you will be developing throughout the semester. Projects are a major component of this course and are worth 50% of your total grade, and 15% for the final project

- **Collaboration:** I would encourage some collaboration between you and your peers while working on tasks and projects, but your work must be your own. The guideline is: you should never have any trouble explaining your work.

- **Late Submission Policy**: Late submissions receive a 10% reduction in grade per day it is late (not counting weekends). This begins with a 10% reduction for an assignment turned in after the deadline

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Tests: Two tests will be given (one mid-semester and one during finals) and comprise 30% of your total grade.

Final Grades: The points you receive during the course are weighted accordingly: projects 65%, tests 30%, 5% for your "new feature" short presentation. The grade you earn in this course is based on the following scale:

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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

Final Exam: 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.

Academic Honesty: 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.

Academic Accommodations: 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. Students with learning disabilities who may need accommodations should discuss options with the instructor during the first two weeks of class. For more details see the PLNU catalog:http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#AcademicAccommodations

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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Copyright Protected Materials: 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.

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EGR 120-01 Course Topics Outline

Week #	Project Type	Beginning date
Week 1	Project #1: MATLAB Basics	October 20, 2016
Week 2	Project #2: Gaussian Curves	October 25, 2016
Week 3	Project #3: Basic Scripting	November 1, 2016
Week 3	Project #4: Monte Carlo	November 8, 2016
Week 3	Project #5: Random Walk	November 15, 2016
Week 3	Exam 1	November 22, 2016
Week 3	Project #6: Animation and 3D Exploration	November 29, 2016
Week 3	Feature Presentation	December 1, 2016
Week 3	Final Project	December 6, 2016
Week 3	Exam 2 – Final 10:30 – 1:00	December 13, 2016

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