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| 1. **Course title/number, number of credit hours** | | | |
| EML 4534 Computer Applications in Mechanical Engineering II | | | 3 credit hours |
| **2. Course prerequisites, corequisites, and where the course fits in the program of study** | | | |
| Prerequisites:  1. Computer Applications in Engineering 1 - EGN 2213 or Intro to Programming in C - COP 2220  2. Engineering Mathematics I – MAP 3305 or Differential Equations I - MAP 2302  3. Strength of Materials – EGN 3331 or equivalent | | | |
| **3. Course logistics** | | | |
| Term: Spring 2014  Class location and time: SO200, TR 9:30- 10:50. All homework work assignments will be posted and submitted online using Blackboard. | | | |
| **4. Instructor contact information** | | | |
| *Instructor’s name*  *Office address*  *Office Hours*  *Contact telephone number*  *Email address* | | Dr. Pierre-Philippe Beaujean  Building 36, Room 178, Boca Campus  T,R 11:00-12:30 or by appointment  561-297-0530  pbeaujea@fau.edu | |
| **5. TA contact information** | | | |
| *TA’s name*  *Office address*  *Office Hours*  *Contact telephone number*  *Email address* | | Nicholas Rasoletti  nrasoletti2013@fau.edu | |
| **6. Course description** | | | |
| Review of MATLAB language, numerical methods utilized in solving mechanical engineering problems, projects related to solid body mechanics and thermal systems. | | | |
| **7. Course objectives/student learning outcomes/program outcomes** | | | | |
| ***Course objectives:***The objective of the course is to provide students with a basic knowledge of using computer for the solution of engineering problems.  ***Student learning outcomes & relationship to ABET a-k outcomes***  Outcome 1: Students should be capable of programming engineering type problems in MATLAB. (a,e,k)  Outcome 2: Students should be able to utilize built in solvers in MATLAB. (a,e,k)  Outcome 3: Students should be capable of simulating dynamic systems. (a,e,k)  Outcome 4: Students should be able to use different optimization techniques. (a,e,k) | | | | |
| **8. Course evaluation method** | | | | |
| Grading and Exam Policy  * + Assignments  40%   + Midterm 30%   + Final 30% | | | | |
| **9. Course grading scale** | | | | |
| |  |  |  | | --- | --- | --- | | **The minimum grade required to pass the course is C** | | | | **Letter Grade** |  | **Percent (%)** | | A |  | 94-100 | | A- |  | 90-93 | | B+ |  | 87-89 | | B |  | 84-86 | | B- |  | 80-83 | | C+ |  | 77-79 | | C |  | 74-76 | | C- |  | 70-73 | | D+ |  | 67-69 | | D |  | 64-66 | | D- |  | 60-63 | | F |  | 0-59 | | | | | |
| **10. Policy on makeup tests, late work, and incompletes** | | | | |
| **Submission Deadline**  Submission is ALWAYS due on or before the end of the due date (5 pm)  Homework will be submitted through SafeAssignment in addition to hard copy.  **Late Submissions**  Late submission will carry penalty of 10% per day.  **Make-up Exam Policy**  Make-up exams or homework assignments will be permitted only under extenuating circumstances and only with notification and documentation (original funeral notice, original doctor note, jury summons, police report, military orders, etc.  See the current FAU College Catalog for a more comprehensive description of what is acceptable in allowing make up exams).  The instructor reserves the right to create alternate make-up exams for students who are not able to take the scheduled exam.  *Departmental Policy: Makeup tests* are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student of participating in the exam. Makeup exam should be administered and proctored by department personnel unless there are other pre-approved arrangements  *Late work* is not acceptable.  *Incomplete grades* are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given. | | | | |
| **11. Special course requirements** | | | | |
| Access to COECS computer system. | | | | |
| **12. Classroom etiquette policy** | | | | |
| **Etiquette:** In all online communication, it is expected that all students will follow rules of online "netiquette". Netiquette is a set of rules for polite online behavior that all members of this class is expected to follow.  Basically, "be respectful and be polite to each other " and "be patient"  No one is perfect and we all have different approaches to life, work, and school.  Individuals who violate the netiquette policy or engage in disruptive online behaviors such as flaming (posting disrespectful or hostile comments), posting inappropriate comments, or shouting (posting messages using all capitals) may have their course access privileges revoked and/or they may be referred to the Student Dean. Students who continue to engage in unacceptable online behavior even after being warned, may be permanently denied access to the course and/or may receive an F for the course.  Please don't use email short hand like ROTFLO (rolling on the floor laughing out loud) or BTW (by the way) - not everyone knows what these abbreviations mean.  Remember that in the real world we can see the facial expressions, gestures, and hear tone of voice. We can't do that online so it's very easy to misinterpret another person's meaning to to be misinterpreted ourselves. Be careful of how you communicate to your instructor and to your peers online. If you want to use emoticons (smileys) to convey feelings, please stick with the basics happy :-) sad :-( or wink ;-) Others are less well known and are subject to different interpretations. The idea is to be clear in your communications.  If you have a concern about the course, a test or an assignment, please contact the instructor. | | | | |
| **13. Disability policy statement** | | | | |
| In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton campus, SU 133 (561) 297-3880 and follow all OSD procedures. | | | | |
| **14. Honor code policy** | | | | |
| Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at  [www.fau.edu/regulations/chapter4/4.001\_Code\_of\_Academic\_Integrity.pdf](http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf) | | | | |
| **15. Required texts/reading** | | | | |
| Required Text: EW. Bober, C.T. Tsai, O. Masory, “Numerical and Analytical Methods with Matlab”, CRC Press (ISBN 978-1-4200-9356-8). | | | | |
| **16. Supplementary/recommended readings** | | | | |
| Class notes | | | | |
| **17. Course topical outline, including dates for exams/quizzes, papers, completion of reading** | | | | |
| |  | | --- | | 1. A review of MATLAB concepts (6 hrs) (Chapters 1, 2 and 3 in textbook)  a. MATLAB windows  b. MATLAB’s basic component (a matrix), variable names, the colon operator  c. Input/Output commands  d. Loops  e. *If-else* and *if-else-if* ladder  f. Built-in functions and user-defined functions  h. Plot commands  i. Linear interpolation  j. Solution of systems of linear equations using MATLAB built-in functions  2. Optimization (6 hrs) (Chapter 9 in textbook)  a. Unconstrained optimization, method of deepest descent  b. Constrained optimization, Lagrange multipliers  c. Using Matlab *Fmincon* optimization function  3. Numerical Integration (6 hrs) (Chapter 5 in textbook)  a. Simpson’s rule  b. Improper integrals  c. MATLAB *quadl* function  4. Solution of ordinary differential equation (6 hrs) (Chapter 6 in textbook)  a. Runge – Kutta method for a system of ordinary differential equations  b. Use of MATLAB *ode45* function  5. Solution of PDE using finite difference method (6 hrs) (Chapter 10 in textbook)  6. Simulation of dynamic systems (10 hrs) (Chapters 7 and 12 in textbook)  a. Review of Laplace Transforms (5 hours)  b. Simulation using Simulink (5 hours) | | | | |