ENGR 4390.003 - Advanced Plasma Engineering and Applications

Course Description
Advanced studies and diagnostics on physical, electrical, chemical properties of plasmas; Advanced studies on properties of thermal, non-thermal plasmas, DC/AC plasma sources, inductive and capacitive coupled plasma sources, diagnostics and applications of plasmas. Advanced designing, construction, testing, diagnostics and demonstration of plasma source for engineering and other applications;

Prerequisites: ENGR 4390.002 - Introduction to Plasma Engineering and Applications.

Learning Objectives
1. To learn about advanced properties of thermal and non-thermal plasmas
2. To learn about advanced plasma diagnostics and characterization techniques
3. To learn about advanced applications of thermal and non-thermal plasmas
4. To design and construct plasma source for engineering application
5. To test and optimize plasma source for engineering application
6. To diagnose and characterize plasma source for engineering application

Major Course Requirements
Detailed Plasma Source Design Completion 10%
Plasma Source Construction Completion 25%
Plasma Source Testing & Optimization 10%
Plasma Source Diagnostics & Characterization 25%
Plasma Source Final Project Demonstration & Report 30%

Grading Scale: A = 100-90; B = 80-89; C = 70-79; D = 60-69; F = below 60

Required or Recommended Readings
*Textbook:* Reading materials will be provided by the instructor. It will be posted in the blackboard.

State Adopted Proficiencies/TExES competencies (COE)

Course Policies

*Attendance/Tardiness*
Attendance will be taken at every scheduled class meeting. Students are expected to attend every scheduled class and laboratory meeting. Routine events should be scheduled to avoid class conflicts. In general, only unavoidable absences are excused with valid proof of documentation (major family illness or accidents, deaths, funerals).
Participation
All students are expected to participate actively in classroom discussions, question and answer discussions, working well with team members on lab assignments and contributing at the expected level to the group projects. Participation will be evaluated through instructor evaluation and also by peer-evaluation throughout the semester and it is accounted for grading.

Classroom/professional behavior
Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

Statement of Civility
Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of gender, ethnic/racial origin, religious background, age, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

http://falcon.tamucc.edu/~students/JAffairs/ja_hndbk_academic_info.htm

Late work and Make-up Exams
All assignments should be submitted in the class. Late homework after the due class time will not be accepted, except under rare conditions with prior approval from the instructor. Missed Exams – excused only per TAMUCC guidelines. Make-up exams are given only at extremely rare and unavoidable circumstances such as personal injury, health issues, death of an immediate family member and/or a travel with prior approval.

Extra Credit
Extra Credit questions/problems will be given in some of the tests and homeworks.

Cell Phone/Electronic Device Usage
Usage of cell phones and other electronic devices such as laptops, ipod, ipad etc. are strictly not permitted in class during the lecture, unless explicitly instructed by the instructor to use it in classroom.

Academic Integrity/Plagiarism.
University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a 0 for the assignment and possibly an F for the class.

Dropping a Class
I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must
initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. 4/11 is the last day to drop a class with an automatic grade of “W” this term.

Preferred methods of scholarly citations
Homework/project calculations should be submitted in an organized and neatly presented form. Circle or box the answers to each problem. Appropriate units must be included on all answers. All calculations need to be on an engineers pad. Write your name, the course number, the assignment number, and date. Pages are to be numbered and stapled.

Grade Appeals*
A student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is on the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details on the process, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, consult Texas A&M University–Corpus Christi University Procedure 13.02.99.C2.01 Student Grade Appeal Procedures (http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage (http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school or the College of Science and Engineering Dean’s Office.

This syllabus is a draft in progress: the instructor reserves the right to modify it’s contents. While the instructor will attempt to notify all students of any changes, it is ultimately the student’s responsibility to keep apprased of those substitutions/changes/additions/deletions/etc.

Disabilities Accommodations*
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Driftwood 101.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

*Required by SACS or HB2504

Statement of Academic Continuity
In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.
Schedule*

1. Advanced properties of thermal and non-thermal plasmas (1/22)
2. Designing of plasma source for engineering application (1/22)
3. Construction of plasma source for engineering application (2/10)
4. Advanced plasma diagnostics and characterization techniques (2/24)
5. Testing and optimization of plasma source for engineering application (3/17)
6. Diagnostics and characterization of plasma source for engineering application (3/31)
7. Advanced applications of thermal and non-thermal plasmas (4/14)
8. Plasma source final project demonstration & report submission (5/05)