COURSE SYLLABUS

Course Prefix/Number: MAP4341

Note Well: This online course will use Elluminate as the platform for instruction. The medium permits real-time instruction/communication, full two-way audio, optional live display of video, and a versatile combination of applications. Students who enroll for this online course should contact the Math-Stat Department (474-2276) for a demonstration of Elluminate so they will be properly set up BEFORE classes begin.

Course Title: Partial Differential Equations

Course Credit Hours: 3

Instructor Name and Contact Information: Jia Liu, Ph.D. (850)-474-3202
Office: Bldg. 4, Rm 344
Office Hours: Friday 12pm – 2pm

Distance students should communicate with instructor (by email) to set up office hours via Elluminate when they have the need to meet. I will set up the discussion forum on elearning for the online students.

Prerequisites: MAP 2302

Course Description: First-order equations, derivation and classification of second-order equations, Solution techniques of boundary-value and initial-value problems, applications.

Student Learning Outcomes:
The course is aimed at introducing students to the area of partial differential equations as a natural extension of the course on ordinary differential equations. Students who successfully complete this course will be able to:

1. Recognize the partial differential equations that model real life situations that occur frequently in physical, engineering and other sciences.
2. Classify partial differential equations in terms of order, linearity, degree, and type;
3. Transform given second-order equations into standard forms: hyperbolic, parabolic, or elliptic.
4. Apply the method of characteristics to solve quasi-linear first-order equations;
5. Apply Sturm-Liouville theory.
6. Apply methods of Fourier series and Separation of variables.
7. Apply transform methods for solving PDE’s.

Topics Covered:

- A review of ordinary differential equations
  First-order equations
  Second-order linear, constant coefficient equations
- Partial Differential Equations
  Basic Terminology - Linearity, order, homogeneity.
  First-order equations
- Classification: Canonical Forms for Second Order Equations
  Hyperbolic Equations
  Parabolic Equations
  Elliptic Equations
  A Special Case: Constant Coefficients
- Sturm-Liouville Theory. Eigenvalue Problems
  - Sturm-Liouville Systems
  - Eigenvalues and Eigenfunctions
  - Orthogonality of Eigenfunctions
  - Eigenfunction expansion of functions
  - Singular Sturm-Liouville Systems
- Trigonometric Fourier Series
  - Conditions for Fourier Expansion
  - Fourier expansions (general)
  - Sine and Cosine Series
  - Convergence of Fourier Expansions
- The Method of Separation of Variables
  - The Vibrating String
  - The Laplace Equation
  - Bessel Functions
- Transform methods of solution.

**Recommended Texts:** Tyn Myint-U & Lokenath Debnath; Linear Partial Differential Equations for Scientists and Engineers (4th edition); Birkhauser, Boston, MA (2007)

**Grading / Evaluation:**
2 Tests = 60%; 1 take home project = 40%

Semester grades will be computed according to the grid:
- **A:** 90% - 100%;  **B:** 80% - 89%;
- **C:** 70% - 79%;  **D:** 60% - 69%;
- **F:** below 59% or informal withdrawal.

**Attendance:** Attendance is essential. Students must arrive promptly and stay until dismissed. Absent students (whether excused or not) are responsible for everything missed.

**Withdrawal Policy:** Students must initiate withdrawals. Important deadlines:
- **Drop/Add Period:** 01/07/2013 - 01/11/2013
- **Withdrawal deadline from all courses with partial refund:** (Automatic grade of WR) 02/01/2013
- **Withdrawal from individual or all courses and grade of W:** 03/22/2013
- **Late Withdrawal:** (Grade of W or WF at instructor’s discretion) 04/26/2013

Students who are requesting a late withdrawal from class, must have the approval of the advisor, instructor, and department chairperson (in that order) and finally, by the Academic Appeals committee. Requests for late withdrawals may be approved only for the following reasons (which must be documented):
1. A death in the immediate family.
2. Serious illness of the student or an immediate family member.
3. A situation deemed similar to categories 1 and 2 by all in the approval process.
4. Withdrawal due to Military Service (Florida Statute 1004.07)
5. National Guard Troops Ordered into Active Service (Florida Statute 250.482)

Requests without documentation should not be accepted. A requests for a late withdrawal simply for not succeeding in a course, does not meet the criteria for approval and should not be approved.
**Classroom Conduct:** UWF respects the right of instructors to teach and students to learn. Behavior in the classroom that is disruptive according to the UWF Code of Conduct will not be tolerated and will be reported to the Office of Student Affairs. Students also must adhere to rules regarding food and drinks in Hi-Tech and eClassrooms. Using cell phones, earphones, pagers, recorders, or cameras in class is prohibited. If brought into the classroom, these devices must be set to OFF or SILENT. **Please come to class on time and leave when it is dismissed.**

**Special Technology Utilized by Students:** Scientific or graphing calculator allowed.

**Expectations for Academic Conduct/Plagiarism Policy:**
As members of the University of West Florida, we commit ourselves to honesty. As we strive for excellence in performance, integrity—personal and institutional—is our most precious asset. Honesty in our academic work is vital, and we will not knowingly act in ways which erode that integrity. Accordingly, we pledge not to cheat, nor to tolerate cheating, nor to plagiarize the work of others. We pledge to share community resources in ways that are responsible and that comply with established policies of fairness. Cooperation and competition are means to high achievement and are encouraged. Indeed, cooperation is expected unless our directive is to individual performance. We will compete constructively and professionally for the purpose of stimulating high performance standards. Finally, we accept adherence to this set of expectations for academic conduct as a condition of membership in the UWF academic community.

**ASSISTANCE:**
Students with special needs who require specific examination-related or other course-related accommodations should contact Barbara Fitzpatrick, Director of Disabled Student Services (DSS), dss@uwf.edu, (850) 474-2387. DSS will provide the student with a letter for the instructor that will specify any recommended accommodations.

**Special Assistance:**
Students with special needs who require specific examination-related or other course-related accommodations should contact Barbara Fitzpatrick, Director of Student Disability Resource Center (SDRC), sdrc@uwf.edu (850) 474-2387. CDRC will provide the student with a letter for the instructor that will specify any recommended accommodations.

**WEATHER EMERGENCY INFORMATION**
In the case of severe weather or other emergency, the campus might be closed and classes cancelled. Official closures and delays are announced on the UWF website and broadcast on WUWF-FM.

**Weather Emergency Information**

- WUWF-FM (88.1MHz) is the official information source for the university. Any pertinent information regarding closings, cancellations, and the re-opening of campus will be broadcast.
- In the event that hurricane preparation procedures are initiated, the UWF Home Web Page and Argus will both provide current information regarding hurricane preparation procedures, the status of classes and the closing of the university.
Emergency plans for the University of West Florida related to inclement weather are available on the following UWF web pages:

Information about hurricane preparedness plans is available on the UWF web site:
http://uwfemergency.org/hurricaneprep.cfm

Information about other emergency procedures is available on the UWF web site:
http://uwfemergency.org/

Miscellaneous
Always check your UWF email box. The group email will be sent to your UWF email address only.
I reserve the right to make any change to the above syllabus. However, you will be notified about any change may appear