Math 405-WWW Syllabus  
FALL 2008
Numerical Analysis I

Instructor: Dr. Ianna West

Office: Peltier 106-B
Office Hours: 2T, 4T, 5T, 6T  and Online M/W/F 10:00-11:00AM and T/R 3:00-4:00. Instructor will be available for consultation via email or in the Blackboard virtual classroom during online office hours, or by appointment. Also instructor will be available online throughout the day.
Email: ianna.west@nicholls.edu
Phone: 985-448-4394

Section: WWW
Other Materials: A computer with internet capability. Also a graphing calculator is highly recommended.

Prerequisites: MATH 265, 355, 360, and CMPS 221
Catalog Description: We will cover numerical solutions of equations and systems, convergence theorems, eigenvalue and eigenvector methods, interpolation and extrapolation. Attention to theory with emphasis on methods applicable to high-speed computation.

Student Outcome Objectives:
Student will be able to:
1. identify the types of problems that require numerical techniques for their solution, use appropriate numerical methods to accurately approximate the solution of problems,
2. understand the error propagation that can occur when numerical methods are applied,
3. use techniques for estimating error bounds for the approximations,
4. use computer software packages to approximate the numerical solutions to problems,
5. find the root or zero of an equation and understand when to use the Bisection Method, Newton’s Method, or Muller’s Method
6. understand the connection between a fixed-point problem and a root-finding problem,
7. understand and apply convergence theorems,
8. understand the difference between a sequence that is linearly convergent and one that is quadratically convergent,
9. use iterated interpolation techniques to generate higher-degree polynomial approximations at a specific point
10. use Divided-difference methods to generate polynomials that approximate given data,
11. use piecewise-polynomial approximation techniques to find an approximation of high-degree polynomials,
12. approximate integrals and derivatives using numerical methods,
13. approximate the solutions to initial-value problems using numerical methods.
Course Content and Requirements

**Hardware and Software Requirements:** The course will be conducted via internet using Blackboard and email. The URL for the university’s distance learning website is [http://www.nicholls.edu/distance/](http://www.nicholls.edu/distance/). FAQs about internet courses can be viewed at [http://www.nicholls.edu/distance/faqs/](http://www.nicholls.edu/distance/faqs/). A download for minimum computer requirements for taking a course on Blackboard can be found in the last question on the FAQs site given above. A Blackboard Tutorial can be viewed at [http://www.nicholls.edu/distance/blackboard-tutorial/](http://www.nicholls.edu/distance/blackboard-tutorial/).

Also, students will be required to complete projects using a computer algebra system CAS (a software program that facilitates symbolic mathematics), such as, Maple, Matlab, Mathematica, etc. During the semester, the instructor will give tutorials on using Maple. However, if a student is familiar with another CAS, the student may utilize it for his/her projects. At this time Maple is available on the computers in the lab in 115 Peltier Hall on Nicholls’ campus. The university lab is available to all MATH 405 students. The hours of operation for the lab will be announced. If a student will not be on-campus, he/she will have the option of purchasing Maple online at a discounted rate. Details will be given at a later date.

**On Campus Meeting Requirements:** Students will be required to meet on-campus to take the final exam if he/she lives within a reasonable driving distance of the campus.

**Notes:** Lecture notes and homework assignments will be posted on Blackboard.

**Methods of Evaluation:**

**Homework:** Specific problems from the exercises will be assigned from each section. Students are strongly encouraged to complete all exercises to ensure an understanding of the concepts. Specific exercises from those assignments will be given for a grade. The problem sets will vary in point value depending on the number of problems assigned. The homework will be worth 40% of the total grade.

**Projects:** There will be two computer projects that will be worth 10% of the total grade.

**Exam:** There will be a final exam worth 50% of the total grade. Date of exam will be announced. Students who live out-of-state, or students who do not live within a reasonable driving distance to the Nicholls’ campus, may request an alternative location (an approved testing center) to take the exam. Arrangements need to be made by the student in advance. Therefore inform the instructor at the beginning of the semester if you cannot take the exam on-campus.

**Distance Learning Form:** A copy of the distance learning form is attached to the syllabus. This form is only for students who will take the exam off-campus. The form will be sent by the instructor to the approved testing center and is to be filled out by the test administrator.

**Grade:** Grade will be calculated on a ten point grading scale 90-100 A, 80-89 B, 70-79 C, 60-69 D, below 60 F.

| Homework | 40% |
| Projects | 10% |
| Final Exam | 50% |

**Distribution of points may change during the semester**
Make-up Procedure: To make up the final exam, student must have a valid written excuse resulting from an emergency situation. However, students representing the university in any official capacity will be granted a valid excuse and will be allowed to make up the final, provided arrangements are made sufficiently in advance with the instructor and documentation of the absence can be produced by the student.

Behavioral Policy: Students must behave in a professional manner at all times. Failure to act in an appropriate manner will not be tolerated.

Attendance Policy: Participation in activities is required where an electronic record which clearly indicates the date and time the activity was submitted. For financial aid purposes, student must complete at least one activity, which is equivalent to having attended an on-campus class at least once.

Academic Honesty Policy: Cheating will not be tolerated. Sanctions for academic cheating, plagiarism, and forgery of academic documents including signing another's name (Sec 1.9) are those outlined in the Code of Student Conduct handbook.

Academic Grievances
The proper procedure for filing grade appeals or grievances related to academic matters is listed in Section 5 of the Code of Student Conduct handbook and at the following link: http://www.nicholls.edu/documents/student_life/code_of_conduct.pdf.

Continued Learning following an Extreme Emergency
In order to make continued learning possible following an extreme emergency;

Students are responsible for:
- reading regular emergency notifications on the NSU website;
- knowing how to use and access Blackboard (or university designated electronic delivery system);
- being familiar with emergency guidelines;
- evacuating textbooks and other course materials;
- knowing their Blackboard (or designated system) student login and password;
- contacting faculty regarding their intentions for completing the course.

Faculty are responsible for:
- their development in the use of the Blackboard (or designated) software;
- having a plan for continuing their courses using only Blackboard and email;
- continuing their course in whatever way suits the completion of the course best, and being creative in the continuation of these courses;
- making adjustments or compensations to a student’s progress in special programs with labs, clinical sequences or the like, only in the immediate semester following the emergency.

Americans with Disabilities Act: If you have a documented disability that requires assistance, you will need to register with the Office of Disability Services for coordination of our academic accommodations. The Office of Disability Services is located in Peltier Hall, Room 100-A. The phone number is (985) 448-4430 (TDD 449-7002).

The last day to drop this course with a “W” is Friday, October 24, 2008
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**Changes to the syllabus may be made, but the instructor will make reasonable accommodations for students who for some reason may be adversely affected by the change.**
Students taking examinations via distance learning are required to make arrangements with an authorized testing institution. These accommodations are to be communicated to the instructor of the distance learning course.

Please note the following:

1. The testing center / test administrator shall have computer / e-mail access for the student during the examination period in the event of online communication by the instructor.
2. The testing center shall have telephone** access for the student during the examination period in the event of oral communication by the instructor. Some instructors wish to speak with the student and the test administrator at the commencement of the testing period.
3. At the end of the testing period, the test shall be signed by both the student and the test administrator.
4. The student shall present photo identification before gaining access to the examination.
5. At the discretion of the administrator, unusual disruptions of the testing period shall be documented and communicated to the instructor.

### Form Fields

- Name of Student: _____________________ Course: ____________________________
- Instructor: ____________________________
- E-mail of Instructor: _______________________
- Date of Exam: __________ Time of Exam: _________ □ Eastern  □ Central
  □ Mountain  □ Pacific
- Institution Administering Test: ________________
- Institution Website: _______________________
- Test Administrator: ________________________
- Department: _______________________________
- Position/Title: ____________________________ (This will be verified by the Nicholls Math Dept.)
- E-mail Address: ____________________________ (Must be available during exam)
- Administrator’s Phone: _______________________
- **Exam Phone (if different from above): ________________ (Must be available during exam)