Math 570-WWP   Syllabus   Spring 2014

Mathematical Modeling

Instructor: Dr. Ianna West
Office: Peltier 106-B
Office Hours: *For immediate online consultation:* Monday & Wednesday 9:00 AM – 11:00 AM and Friday 9:00 AM – 10:00 AM unless otherwise specified.

To fulfill the University requirement, I am generally in my Nicholls' on-site office on Tuesday and Thursday from 9:00 AM – 10:30 & 11:50 AM – 3:30 PM. You may reach me during these hours by phone or email. I will be available periodically for consultation via email outside of my regularly scheduled online hours and on-site office hours. I will reply to emails within 48 hours Monday through Friday. In addition, I will be available to answer questions on some weekends and holidays. A student may make an appointment to speak with me by telephone, Skype or Adobe Connect.

Email: ianna.west@nicholls.edu
Office Phone: 985-448-4394
Moodle: http://moodle2.nicholls.edu/moodle/

Section: WWP (Online)
Recommended Text: **A First Course in Mathematical Modeling, 4th Edition by** *Frank R. Giordano, William P. Fox, Steven B. Horton, Maurice D. Weir;* Published by Cengage Learning. ISBN10:0495011592 .   The purchase of the textbook is highly recommended. However, in this course, material from only a few chapters of the textbook will be used. Students have the option to purchase the book or purchase eChapters from the publisher for $11.99.

Click Here to View Book Order Options

Other Course Materials: Access to a computer with internet is required. Maple Software, Excel or another Computer Algebra System (CAS) is required. Maple purchase information will be given by the instructor. Word processing software such as Microsoft Word is highly recommended.

Prerequisites: MATH 265 (Calculus III), MATH 355 (Differential Equations) and MATH 402 (Mathematical Statistics).

Catalog Description: Use of previous course work to construct models for various problems in the sciences, managerial sciences, or other related areas.

Student Outcome Objectives:

1. Given a real world scenario, the student will be able to identify a problem, collect data and make assumptions, propose a model, test the assumption, and refine the model as necessary.

2. Given a model, the student will be able to work backward to uncover the implicit underlying assumptions, assess critically how well those assumptions fit the scenario, and estimate the sensitivity of the conclusions when the assumptions are not precisely met.
3. Student will be able to apply the fundamental laws of nature to given situations that will aid in the construction of models.
4. Student will be able to develop models of phenomenon that changes over time, both over discrete time periods and when the behavior is taking place continuously.
5. Student will be able to develop and solve dynamical systems.
6. Student will examine how to produce descriptions of systems, and then develop the tools for extracting information, make predictions from these descriptions and analyze the effects various situations have on it.
7. Student will be able to develop solutions using a range of analytical techniques applying calculus, linear algebra, differential equations, and/or probability.
8. Use a computer algebra system (CAS) to create graphs, construct a table of data, fine

Course Requirements, Course Content, and Methods of Evaluation

Minimal Technical Skills, Hardware and Software Requirements:
Access to a computer with internet is required. Students must be able to use different components of Moodle, the LMS (learning management system) used by Nicholls, and students must gain access to their Nicholls' email.   I will post all information needed to take this course on Moodle.

Students will be required to type answers to exercise assignments and create graphs using a CAS (Computer Algebra System) or Excel. If a word processor other than Microsoft Word is used, the assignment must be submitted in PDF format, and the mathematical equations, expressions, symbols, etc. must be legible.

For students typing the assignments using Microsoft Word, I highly recommend *Mathtype*, a powerful interactive equation editor for Windows that enables creation of mathematical notation for word processing. *Mathtype* works in conjunction with Microsoft Word. There is also a Macintosh version of *Mathtype*.   *Mathtype* may be purchased at a cost of $57 online at
http://www.dessci.com/en/products/mathtype/ .
Students must know how to receive and send emails properly, as well as reply to an email using their Nicholls' email account. Criteria for email communication may be found on the Moodle Course Homepage. Students must be able to attach a file to an email, upload a file on Moodle, etc. Student must be able to open a PDF document using Acrobat Reader or some other PDF reader which may be downloaded free from the internet. If the students are not familiar with one or more of the software and/or web-based tools mentioned, students must have the ability to familiarize themselves with these necessary web-based tools and/or software either by exploration or tutorials.

The links to important tutorials are given below.
The URL for the University's distance learning website is
http://www.nicholls.edu/distance/ .
FAQS about internet courses can be viewed at the website
http://www.nicholls.edu/distance/faqs/ .
The FAQS website will give students insight as to what they should expect from an online course, as well as answer many frequently asked questions.

A Moodle Tutorial can be viewed at the website
http://www.nicholls.edu/distance/moodle-tutorial/ .

Attendance Requirements, Course Content, Methods of Evaluation and Point Distribution

On-Campus Meetings or Proctor Requirements: Students will meet on-campus to take the final exam if they live within a reasonable driving distance of the campus. Distance learners must locate an approved testing facility near their home. A list of approved testing centers is given on the Proctor Approval Form. There is a link to the Proctor Approval Form in the header block section of the Moodle Course Homepage.

Proctor Requirements for Distance Learners: Distance learners are those students who must take the final exam off-campus because they do not live in driving distance of Nicholls' campus. Distance learners must locate an approved testing facility near their home. A student wishing to take the exam off-campus must ***inform me via email***, and the student must complete a Proctor Approval Form using Microsoft Word by the deadline. The form may be found on the Moodle Course Homepage. The completed Proctor Approval Form must be unloaded on Moodle using the link provided on the Course Homepage. A list of approved testing centers and proctors is given on the Proctor Approval Form.
<p align="center">*****Completed Proctor Approval Form Deadline April 1, 2014*****</p>

Once I have approved a proctor, the student who plans to take the final exam off-campus ***must schedule*** the final exam with the proctor at least three weeks prior to the test date. I will send a Test Administration Procedure Form to the approved testing center or proctor approximately one week before the scheduled exam. The ***test administrator*** will be required to complete the Test Administration Form and return it to me before the day of the test. Therefore, if a student plans to take his or her final exam off-campus, it is vital that the student complete and upload the Proctor Approval Form by the deadline.

Modules
Modules are subsections posted on Moodle containing several links and folders. The modules contain learning objectives, learning activities, assignments, and all pertinent information pertaining to the section(s) being covered during a given time period. The instructor will post a new module every 7 to 10 days on Moodle.

A module will include module-level learning objectives, learning activities, lecture notes, assignments, discussion forums and all other pertinent information pertaining to activities required to complete the assessments that correspond to the sections being covered during a particular time period. The modules will be posted according to the dates listed in the Course Outline, the last page of this syllabus, and on the Course Calendar located on the Course Homepage. It is important that students read all documents contained within the modules since they contain instructions on how to meet the requirements each week.

> *Instruction Sheets*
> An Instruction Sheet will be posted in each module which will include the learning objectives, and instructions on how to achieve those objectives. Each Instruction Sheet will contain the reading assignments along with the exercise assignment and discussion forum information along with the due dates.

Exercise Assignments
Problems from the textbook and/or supplemental exercises will be assigned for each module. Students are required to complete all exercises. The exercises are used to assess the students' understanding of the concepts. The students will have one to two weeks to complete each assignment depending on the length and/or complexity of the material. The final grade for the exercise assignments will be based on the average of all exercise assignments and will be worth ***50% of the semester grade***. The students will be required to upload all completed assignments within the corresponding module on Moodle. A document

on how to format the page numbers and heading of the assignments is available the Moodle Course Homepage.

Exercise Assignment Grading and Feedback

The students should expect to receive feedback on exercise assignments within two weeks of the due dates. Some problems on the exercise assignments will be self-assessed or peer-assessed. For the problems that are peer-assessed, the name of the student will not be included in the assignment. All information on exercise assignments and how they will be graded may be found in the Instruction Sheets.

Discussion Forums

Discussion Forums for select sections will be posted on Moodle within the modules. These assignments are to help facilitate discussions with your fellow classmates. I will make comments only on select posts. The first forum will be for the purpose of introducing yourself to the class. The introduction forum is posted in the headerblock section on the Course Homepage on Moodle. The subsequent forums will correspond to the learning objectives and will be posted within the modules. Due dates will be given when the forum is posted. The due date of each forum will typically be three days after the corresponding assignment due date. You will be required to post your answer to the question on the forum and to reply to at least one of your classmate's post. Each discussion forum will be worth 10 points. The final grade for discussion forums will be based on the average of all forum grades. The discussion activities will be **worth 5% of the semester grade**. The criterion for grading the forums is on the Course Homepage on Moodle.

Netiquette

When posting on forums and writing emails, the students must always follow the rules of netiquette. These rules can be found at

http://www.albion.com/netiquette/corerules.html .

Late Submission of Exercise Assignments and Discussion Forums

Without prior permission, students who submit an exercise assignment and/or forum late will be penalized. If a student needs more time on a particular assignment he or she must contact me in advance to get permission to avoid a penalty. Without my permission, if a student submits an exercise assignment or posts on a forum after the deadline, but before the assignment has been graded, the student will be **penalized 25%.** If a student submits an exercise assignment after the assignment has been graded, the student will be **penalized 50% with or without my permission.** However, once the answer key has been posted on Moodle for a self-assessed or peer-assessed assignment, a student who has not submitted his or her assignment will receive a zero. Furthermore, if the student has not posted on the Discussion Forum by the time I grade it, the student will receive a zero.

I am aware that many of you have jobs and families, and unexpected things may occur during the semester. Therefore, it is very important to stay in contact with me if you will be late on an assignment. Do not wait until after the assignment is due to ask for an extension.

Final Exam

There will be a final exam worth 45% of the semester grade. Students who live out-of-state, or students who do not live within a reasonable driving distance to 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. Please see the "Proctor Requirements" section of the syllabus.

On-campus Final Exam— Tuesday, May 13th at 10:30 AM
Off-campus Final Exam— either May 12th or May 13th

Semester Grade
The semester 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.

Exercise Assignments	**50%**	***Distribution of points may change during the semester***
Discussion Forums	**5%**	
Final Exam	**45%**	

Policies and Procedures

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

Behavioral Policy
Students must **at no time** be disrespectful toward the professor. Students must always respect the rights of classmates. Students must behave in a professional manner at all times. Failure to act in an appropriate manner will not be tolerated.

Academic Dishonesty Policy
Cheating will not be tolerated.   Sanctions for academic cheating, plagiarism, and forgery of academic documents are outlined in the *Code of Student Conduct* handbook. You may access a copy of the handbook by clicking on the following link:
http://www.nicholls.edu/documents/student_life/code_of_conduct.pdf .

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.

Assistance with Studying and Assignments
- **The Tutoring Center at** 143 Peltier Hall. Call 985-448-4100, email: tutoring@nicholls.edu, or visit http://www.nicholls.edu/academic-enhancement/
- **The Writing Center at** 144 Peltier Hall. Call 985-448-4100, email: tutoring@nicholls.edu, or visit http://www.nicholls.edu/academic-enhancement/
- **Online Tutoring through Moodle.**   Look for the Brainfuse log-in link on the home page, http://moodle2.nicholls.edu/moodle/

Disabilities Services and Compliance
Americans with Disabilities Act: Students with a documented disability are entitled to classroom accommodations under the ADA. To receive accommodations, contact the Office of Disability Services at (985) 448-4430 or 158-A Shaver Gym. Additional information can be obtained at the following website http://www.nicholls.edu/disability/ .

Moodle is designed to meet a variety of world accessibility requirements, including Section 508, Section 504 and W3C. Moodle supports the use of assistive technologies such as screen readers, text magnifiers and speech-to-text solutions. Additionally, all functionality in joule is designed to be keyboard accessible.

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 Moodle (or university designated electronic delivery system);
● being familiar with emergency guidelines;
● evacuating textbooks and other course materials;
● knowing their Moodle (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 Moodle (or designated) software;
● having a plan for continuing their courses using only Moodle 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.

Holidays and Important Dates

Mardi Gras Break: March 3-5
Final day to Drop to receive W: March 28
Advising Begins: April 1
Early Registration Begins: April 8
Easter and Spring Break: April 18 – April 25
Last Day of Classes: May 7
Final Exams: May 8 – May 14

The last day to drop this course with a "W" is Friday, March 28, 2014

Math 570   Course Calendar   Spring 2014

** Tentative Outline (dates may change due to student needs or delays) **

MODULE FOLDERS	SECTIONS	Date Posted	Due by 11:59 PM on the given date
Module 1	Section 1 Introduction to Modeling	01/24/2014	02/05/2014
Module 2	Section 2 Approximating Change with Difference Equations Using Proportionality	02/05/2014	02/14/2014
Module 3	Section 3 Solutions to Dynamical Systems Explored and Analyzed	02/14/2014	02/24/2014
Module 4	Section 4 Systems of Difference Equations	02/24/2014	03/07/2014
Holiday	Mardi Gras and Ash Wednesday Gras	03/03/2014	03/05/2014
Module 5	Section 5 Modeling Population Growth with Differential Equations	03/07/2014	03/17/2014
Module 6	Section 6 Graphical Solutions to Autonomous Differential Equations	03/17/2014	03/26/2014
Module 7	Section 7 Probabilistic Modeling with Discrete Systems	03/26/2014	04/04/2014
Module 8	To be Announced	04/14/2014	04/28/2014
Holiday	Easter/Spring Break	04/18/2014	04/25/2014
Module 9	To be Announced	04/28/2014	05/07/2014
FINAL EXAM	**ON-CAMPUS** Comprehensive final exam is scheduled on Tuesday, May 13, 2014 at 10:30 AM (Classroom to be announced). **OFF-CAMPUS** If exam will be taken by a proctor, student must schedule the final exam either on May 12th or 13th.		

The last day to drop this course with a "W" is Friday, March 28, 2014