



Calculus & Analytic Structures

Instructor: Dr. Ianna West

Office: Peltier 106-B

Office Hours: *For immediate online consultation:* Monday & Friday 9:30AM – 11:30AM unless otherwise specified.

I am also available most of the time for consultation via email outside of my regularly scheduled online 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. Furthermore, you may make an appointment to speak with me by telephone, Skype or Adobe Connect. (If you leave a message on my office phone, then I will receive the message via email).

Email: ianna.west@nicholls.edu

Office Phone: 985-448-4394

Moodle: <http://moodle2.nicholls.edu/moodle/>

Section: WWP (Online)

Required Text : No required textbook.

Suggested References: *Real Analysis, A First Course* by Russell A. Gordon; *Elementary Real Analysis* by Brian S. Thomson, Judith B. Bruckner, and Andrew M. Bruckner; *Foundations of Analysis* by David F. Belding and Kevin J. Mitchell; *Introduction to Analysis* by Edward D. Gaughan; *Advanced Calculus* 2nd Edition by Patrick M. Fitzpatrick; *Advanced Calculus* by Gerald B. Folland; *Advanced Calculus* 5th Edition by Wilfred Kaplan, *Advanced Calculus, A Courses in Mathematical Analysis* by Patrick M. Fitzpatrick.

Prerequisites or co-requisite: MATH 509

Catalog Description: **MATH 511. Calculus and Analytic Structures.** 3-3-0. Prerequisite or co-requisite: MATH 509. Formal exploration of continuity, limits, derivatives, integrals, sequences, series, basic differential equations, and introductory numerical analysis. Applications of concepts. (27.0101)

Course Learning Objectives:

Student will be able to:

1. Apply the essential properties of real numbers, including algebraic structures of real numbers, mappings and functions;
2. Define and apply the definition of bounds of real numbers including the definitions of supremum and infimum and the completeness axiom;
3. Apply properties involving inequalities and identities, properties involving countable and uncountable sets, as well as properties involving real valued functions;

4. Define the properties and concepts and prove theorems involving convergent sequences, monotone sequences, Cauchy sequence, subsequences and series;
5. Formally prove theorems and/or apply properties, lemmas, theorems, etc. involving monotonicity of functions, the limits of functions, intermediate and extreme values, continuity and uniform continuity of functions, differentiation of functions, convergence and pointwise convergence of sequences of functions, convergence of series of functions, and integration of functions.
6. Formally prove basic theorems involving error bounds from numerical methods.
7. Formally prove basic theorems involving the existence and uniqueness of differential equations.

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 learning management system (LMS) used by Nicholls, and students must gain access to their Nicholls' email. I will post all information needed to take this course on Moodle.

A word processor such as Microsoft Word is highly recommended or a scanner is required to scan and upload written assignments. Scanned assignments **must** be saved and uploaded to Moodle as one document. I will not accept an assignment unless it is uploaded as a single document. Furthermore, uploaded scanned, handwritten assignments must be legible with ample space for comments. If the handwritten assignments are not legible, the student will be required to use Microsoft Word or some other word processor to type the assignment. If a word processor other than Microsoft Word is used, the assignment must be submitted as a pdf file. Mathematical equations, expressions, symbols, etc. must be legible and separated from the text. If the students use a computer to complete their assignments, then they must know how to use an equation editor. The mathematical expressions and or equations must be typed using an equation editor such as the built-in equation editor in *Microsoft Word* or use *Mathtype*. *Mathtype* is highly recommended. It is a powerful interactive equation editor for Windows and Macintosh that enables creation of mathematical notation for word processing. *Mathtype* works in conjunction with *Microsoft Word*. *Mathtype* may be purchased at a cost of \$57 online at

<http://www.dessci.com/en/products/mathtype/> .

Students must send and receive emails using their Nicholls' email account. Requirements for email communication may be found within the "COURSE DOCUMENTS & INFORMATION" tab on the Moodle Course Homepage. The criteria for email communication **must be** followed, otherwise the instructor may not respond. Students must be able to attach a file to an email, upload a file on Moodle, etc. Students 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, then students must have the ability to familiarize themselves with these necessary web-based tools and/or software either by exploration or tutorials.

Links to important websites and/or tutorials:

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 or proctor near their home (see additional information below).

Proctor Requirements for Distance Learners: Distance learners are those students who will 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 complete a Proctor Approval Form using Microsoft Word by the deadline given below. There is a link to a Proctor Approval Form available within the "COURSE DOCUMENTS & INFORMATION" tab on the Moodle Course Homepage which contains a list of the types of proctors or facilities that may be used for students who plan to take their final exam off-campus.

The completed Proctor Approval Form must be unloaded on Moodle using the link provided within the "COURSE DOCUMENTS & INFORMATION" tab. Again, the list of approved testing centers and proctors is given on the Proctor Approval Form.

*****Completed Proctor Approval Form Deadline June 30th*****

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 two weeks prior to the test date. Once a proctor has been approved, the professor will send a Test Administration Procedure Form to the approved testing center or proctor. The ***test administrator*** will be required to complete the Test Administration Form before the scheduled exam. 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 on Moodle by the deadline.

Modules

Modules are subsections posted on Moodle containing several folders and links. 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 the modules according to the Course Calendar. A link to the Course Calendar is available on the Moodle Course Homepage. It is also the last page of this Syllabus.

Each 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 module-level learning objectives. The modules will be posted according to the dates listed in the Course Calendar. It is important that students read all documents contained within the modules since they contain instructions on how to meet the requirements for that module.

Instruction Sheets

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

Exercise Assignments

An exercise assignment will be given in each module. Students are required to complete all exercises on the assignment. The exercises are used to assess the students' understanding of the concepts satisfying the module-level learning objectives within the modules. 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 format requirements for assignments is available within the "COURSE DOCUMENTS AND INFORMATION" tab on the Moodle Course Homepage.

Exercise Assignment Grading and Feedback

The students should expect to receive feedback on exercise assignments within one week from the due dates. Some problems on the exercise assignments may 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 may be found in the Instruction Sheets.

Discussion Forums

- ***Introduction***

You must introduce yourself to the class using this forum. The Introduction Forum is worth 10 points and will be calculated with the Topic Discussion Forum grade. (Detailed information is given within the Introduction Forum).

Topic Discussion Forum

Topic Forums for select sections will be posted on Moodle within the modules. Each topic forum is to help facilitate discussions regarding certain topics from a particular module. The professor will make comments only on select posts. The due dates for the Topic Discussion Forums will be posted on the Instruction Sheets (2-3 days after the corresponding assignment is due).

You will be required to post your answer to the question on the forum and reply to at least one of your classmate's post, and you must follow the criteria provided in the Grading Rubric for Topic Discussion Forums.

The Introduction Forum and the Topic Discussion Forums will be worth 10 points each. The final grade for these forums will be based on the average of the combined forum grades and will be worth **3% of the semester grade**.

- ***Q&A Discussion Forum***

From each module, you will be required to post questions and/or comments about the readings, notes, exercises, etc. This assignment will be particularly helpful to facilitate discussions with your fellow classmates on topics in which you may be struggling.

The professor will post comments on the Q&A Forums as necessary to clarify questions or concerns shared by multiple students. You are allowed to make comments about the concepts or answer your classmates' questions according to your understanding of the topic, but you are not allowed to give answers to the exercises.

These discussions will be ongoing. ((Read the Grading Rubric and the instructions that are posted within the Q&A Forum for posting details). These discussions will be worth 15 points each. The final grade for the Q&A Forum will be based on the average of all your Q&A forum grades and will be worth **3% of the semester grade**.

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 receive a zero. Additionally, 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, the following penalties will apply to Discussion Forum posts:

- *Introduction Forum*: receive a zero past the due date;
- *Topic Forum*: penalized 50% after the due date and receive zero after the forum has been graded;
- *Q&A Forum*: receive a zero past the due date.

Final Exam

There will be a final exam worth 44% 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 for Distance Learners" section of the syllabus given above.

****On-campus Final Exam— Wednesday, July 27, 2016 @ 11:00AM ****

****Off-campus Final Exam— either July 26th or July 27th****

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	3%	
Q&A Forum	3%	
Final Exam	44%	

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](tel: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](tel: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 Moodle 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

Independence Day: July 4th

Final day to Drop to receive **W**: July 8th

Last Day of Class: July 26th

****The last day to drop this course with a "W" is Friday, July 8, 2016****

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

MODULE FOLDERS	TOPICS	Tentative Post Date	Assignments are due by 11:59 PM on the following date.
<i>Module 1</i>	Properties of Real Numbers and Tools Used in Analysis	06/01/2016	06/09/2016
<i>Module 2</i>	Introduction to Sequences of Sets and Convergence of Sets	06/09/2016	06/17/2016
<i>Holiday</i>	Independence Day	4 th of July	
<i>Module 3</i>	Theory Involving Convergent Sequences	6/17/2016	6/27/2016
<i>Module 4</i>	Continuity of Functions	06/27/2016	07/05/2016
<i>Module 5</i>	Theory of Differentiation	07/05/2016	07/12/2016
<i>Module 6</i>	Theory of Integration	07/12/2016	07/19/2016
<i>Module 7</i>	Sequence and Series of Functions	07/19/2016	07/25/2016
<i>Q&A Forum</i>			07/26/2016
FINAL EXAM	<p>ON-CAMPUS <i>Comprehensive final exam is scheduled on Wednesday, July 27th at 11:00 AM (Classroom to be announced).</i></p> <p>OFF-CAMPUS <i>If exam will be taken by a proctor, student must schedule the final exam either on July 26th or 27th.</i></p>		

****The last day to drop this course with a “W” is Friday, July 8, 2016****