UNIVERSITY OF GUAM
UNIBETSEDÅT GUAHAN

COLLEGE OF NATURAL & APPLIED SCIENCES
Division of Mathematics & Computer Sciences

Moodle Enrollment Key:

Course: MA301 Differential Equations (3 credits)
Semester: Fañomnåkan (Spring) 2022
Meetings: TTh 11:10 – 12:30
Room: F2F – Warehouse B, Room 2 (WB 2)

Instructor: Dr. Leslie J.C. Aquino
Office: Warehouse B, Room 10 (WB 10)
Telephone: (671) 735-2832
Email: AquinoL8112@triton.uog.edu (best way to contact me)

Office hours: Online via BBB:
Mon. & Wed.: 3:30 – 5:00 PM
Tues & Thurs.: 3:30 – 5:00 PM
or by appointment

Catalog Description:

This course covers the study of the fundamental concepts of differential equations with applications.

Course Content:

The course covers: first-order differential equations and methods for solving, including integration factors, separable equations, exact equations; applications of first-order differential equations; solutions of homogenous linear equations of higher-order, mechanical vibrations, nonhomogenous equations, methods for finding particular solutions, forced oscillations, resonance; linear systems of differential equations; power series solutions; Laplace Transform; qualitative properties and existence of solutions.

Text: *Elementary Differential Equations and Boundary Value Problems, 10th edition (or 6th edition and later), by William E. Boyce and Richard C. DiPrima*

Rationale for Course:

The basic content of the course is fundamental for any student wanting to learn about classical applications of mathematics in physics and engineering. Physical phenomena are almost without exception modeled by differential equations. Also, the course introduces students to ideas which permeate higher mathematics, such as linear independence, existence of solutions, etc.

Prerequisites:

Grade of C or better in MA204.

COVID Statement

The University of Guam is experiencing continued disruption to delivery of instruction during the global coronavirus pandemic. The University will follow executive orders and may be forced to close again, causing more modifications as the semester progresses. All changes will be posted on the UOG website www.uog.edu.

- Contact Office of Information Technology at 735-2630 or oit@triton.uog.edu
- Contact the Triton Advising Center at 735 – 2271 or tac@triton.uog.edu
- Contact Uplift Counseling Services at 787-7978 or uplift@westcare.com

- Contact Project Tulaika Mental Health Services at 647-5317; 647-1901; 647-5440; 647-8833/34 or care@gbhwc.guam.gov

In face to face courses, wearing masks and social distancing is required. Anyone who has a fever, or any other symptom, should stay home. If you do not comply with these directions, you will be asked to leave, and if you do not, class will be cancelled. Patience, respect, and cooperation are needed from all of us to persist through these uncomfortable times.

Attendance:

Your attendance in class is encouraged and is directly related to your grade (see Evaluation below). While effort will be made to deliver lectures both live in class and online, which will be recorded, attendance is encouraged so you have the opportunity to ask questions during class time unlike watching the recorded lecture later. Please inform the instructor if you will be absent. We will run into occasions when we absolutely cannot make it to class. I am subject to those environmental and familial setbacks too, especially in our current pandemic conditions, but we must do our best to attend class on time.

Calculator:

You are required to have a **standalone** scientific calculator for this course, and a graphing calculator is strongly recommended. Students are expected to have a working scientific calculator for quizzes and tests, for those times when a calculator will be allowed. During testing periods, no electronic calculators on tablets, smartphones, or laptops, and no calculators with data connectivity of any type are permitted. No calculator swapping is permitted during testing periods, and **you are still expected to show all required work to receive full credit**.

Computer Algebra Systems and Apps

We will try to incorporate some use of computer algebra systems or math apps in this course, to help illustrate certain topics. I will do my best to use software generally available via the internet. These apps and software systems are optional, additional tools to help you understand the material.

Moodle:

I will be using Moodle as the primary repository for information for this course. I will post the syllabus and any course documents and handouts on Moodle. Assignments, quizzes and exams will be submitted or done through Moodle, unless specifically stated that they will be done in class. We will try to do a "hyflex" format where lectures are live in class and online, to accommodate students who may run into issues during the semester with attending class in person. In these cases, we will use BBB via Moodle to conduct the online sessions. I will also use this as a place where you can see which topics we are covering each week, and to post any announcements made in class (like quiz and test dates). Announcements posted on Moodle are also sent out via email, so pay attention to your automated Moodle messages! **Be sure to check regularly for any new posts for our class.**

Evaluation:

35% Quizzes and Homework *(will drop lowest score)*
40% Tests *(2 or 3 during the semester)*
25% Final Exam *(cumulative)*

100% Total percentage

UNIVERSITY OF GUAM
UNIBETSEDÅT GUAHAN

COLLEGE OF NATURAL & APPLIED SCIENCES
Division of Mathematics & Computer Sciences

Letter grades will be assigned per the UOG Catalog:

A+	98 – 100%		B+	87 – 89%		C+	77 – 79%
A	93 – 97%		B	83 – 86%		C	70 – 76%
A-	90 – 92%		B-	80 – 82%		D	60 – 69%
						F	< 60%

Tests are given at the end of a group of sections, not necessarily per chapter. Dates for quizzes and tests will be announced in class, and posted to Moodle after class; expect a quiz or homework each week.

Our **last test is cumulative** and will be **on Wednesday, May 18, from 12:10-14:00 PM.**

DO NOT SCHEDULE ANY OTHER EVENT DURING THIS TIME PERIOD. Every class has its own exam period and there is no reason another instructor's project or presentation need infringe upon the exam for this class.

NO MAKE-UPS. Contact instructor IMMEDIATELY via email/telephone for extenuating circumstances.

Make-up policy:

There will be no make-up quizzes or tests unless you contact the instructor IMMEDIATELY for extenuating circumstances. For example, you have to go off-island, you will be hospitalized or under serious medical treatment, deployment, etc.

Quizzes and Homework:

Quiz problems will look similar to the suggested homework problems and exercises at the end of each section or chapter. Don't just read through these problems – try to do them yourself and practice, practice, practice! You'll get better at these problems, build your intuition, solidify your understanding, and be able to complete them faster on a quiz or test.

Online quizzes will be conducted via Moodle ***outside of our regularly scheduled class time***, and will have ***a limited time for you to complete the quiz***. You will only have one attempt to do each quiz. Be sure to pay attention to when the quiz opens and closes! If you are in the middle of attempting the quiz, your work will be automatically submitted once the quiz closes. If you did not attempt the quiz, then you will receive a zero for that quiz.

You may need to do additional problems from the textbook to fully master a topic, even if those problems were not assigned. You should ask homework questions at all class meetings or during office hours. Keep in mind that quizzes and tests are based on homework problems and other material from the textbook.

We will also have a few homework assignments that will be collected and graded. These will come from our textbook (10th edition), or be similar to textbook problems, and will give you an opportunity to do more hands-on applications of the topics we cover in class. **We will typically have one quiz or homework per week, and the lowest score will be dropped.**

These assignments will be posted on Moodle, and you download/view the problems, work on them on separate paper, and then submit your work by uploading a PDF or Word document of your work.

Note: There are a number of ways to submit your work as a PDF or Word document – you can scan and save as a PDF if you have a scanner; you can take pictures and save them as PDFs using one of the many apps available; you can take pictures and copy them into a Word document. **If you have trouble uploading to Moodle, email me your assignment to make sure it gets submitted on time.**

Guidance on Alternate Grading Option

Students have the right to use the alternate grading option this semester, but you should be aware that this option may not be appropriate in all courses. In most courses required for professional certification, or programs requiring specialized accreditation, letter grades are required. Think carefully, and talk through your options with a trusted advisor, before exercising this option.

Student Responsibility:

You are expected to spend 1-1½ hours of outside study for each hour inside the classroom. Do not commit the two cardinal sins in a mathematics course: **falling behind and leaving unanswered questions unanswered**. Both will complicate your life and cause a lot of unnecessary stress.

Remember, in order to succeed in any math class, you will need to put in the appropriate amount of time outside of class. So, read the textbook before class, work as many practice problems as you can, write down questions you have as you read or work problems, and ask your questions in class. You will feel a sense of confidence and accomplishment for all problems you complete and attempt. And, since this is a gateway to upper-level math and science courses, practice is the best way to build your math intuition and ensure you have a solid foundation. **Your grade is a direct reflection of the amount of time you put into this class. This is especially true in an online environment – don't fall behind!**

The following are some important notes concerning student responsibilities:

- Please do not ask for a copy of my notes for a day on which you were absent. Employ the buddy system to get copies of any notes you might need. It's probably a good idea to start exchanging phone numbers (or e-mail addresses) with classmates *now* in the event of such a need *later*.
- If you are absent, it is your responsibility to find out what material you missed, either by checking Moodle or contacting me.
- It is your responsibility to keep hold of any supplemental material distributed in class. It is also your responsibility to retain all quizzes, assignments, and tests passed back to you.
- Check Moodle regularly (at least twice a week) to see if there are any announcements you may have missed in class, or to keep track of the topics we are covering each week.
- It is your responsibility to keep an accurate record of your graded work. Again, do not assume I always have my to-the-moment grade sheets ready.
- If you are ill, **STAY HOME** and take care of the more important business of getting yourself well. If you are exhausted, PLEASE get in the needed rest, for coming to class feeling sleepy isn't going to help you much with the day's lesson, even if you are at home attending lectures online.
- Lastly, it is your responsibility to keep, read and know the contents of this syllabus.

Your Math Resources: Office Hours, Math Tutor Lab, TRiO

There are several campus resources available to you if you need extra help with any of the course material.

- **Your instructor!** Find me via email during scheduled office hours, or email me to set up an appointment to meet at another time if you can't make my office hours. We can set up an audio or video call as well, to help you with whatever questions you may have.

- **The Math Tutor Lab!** The CNAS Math Tutor Lab is available for online appointments via Zoom. Students can book an appointment at the tutor lab website uogmathlab.org. For more information, please email mathtutorlab@triton.uog.edu or visit the tutor lab website.
- **TRiO!** The TRiO Programs offers tutoring services to students who meet certain eligibility requirements. TRiO will continue with online tutoring services – be sure to check out their website http://www.uog.edu/trio-programs-home.

UOG Disabilities Policy:

In accordance with the Americans with Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973, the University of Guam does not discriminate against students and applicants on the basis of disability in the administration of its educational and other programs. The University offers reasonable accommodations for a student or applicant who is otherwise qualified, if the accommodation is reasonable, effective and will not alter a fundamental aspect of the University's program nor will otherwise impose an undue hardship on the University, and/or there are not equivalent alternatives. Students are expected to make timely requests for accommodation, using the procedure below.

Disability Support Services (DSS) Office – Accommodation Services

If you are a student with a disability who will require an accommodation(s) to participate in this course, please contact the Disability Support Services office to discuss your specific accommodation needs confidentially. You will need to provide me with a Faculty Notification letter from the DSS counselor. If you are not registered, you should do so immediately at the Student Center, Rotunda office #6, ph/TTY: 671-735-2460, or uogdss@triton.uog.edu to coordinate your accommodation request.

To schedule an appointment on BOOK IT; https://sssablan.youcanbook.me

Office: Student Center Rotunda Office #6
Office Hours: Monday/Wednesday 9:00–noon and 1:00–3:30; Friday by appointment only
Office Phone Number/TTY: 671-735-2460
Email address: sssablan@triton.uog.edu

Academic Integrity Policy:

Academic Integrity is about performing in your role as student in ways that are honest, trustworthy, respectful, responsible, and fair (see www.academicintegrity.org for more information). As a student, you will complete your academic assignments in the manner expected by the instructor. Academic dishonesty, including but not limited to cheating and plagiarism may result in suspension or expulsion from the University. Refer to the UOG Student Handbook and Code of Conduct for more information.

Special note about online courses: I am placing additional trust in all of you to conduct yourselves professionally and ethically for courses being delivered online, in part or in whole. I cannot monitor all of you when you do your homework or when you work on online quizzes and tests. I am trusting your own personal sense of integrity and code of ethics to do the right thing, and that you will do your own work during quizzes and tests – no consulting friends, classmates, other instructors, tutoring websites like chegg, etc. Remember that many of you will follow some code of ethics in your future professions; now is the time to treat your work here at UOG as preparing you for working under those codes of ethics. If you are working in a group on homework assignments, your final submitted work should still be your own. As an instructor,

it is very easy to determine when two students have similar work, even in mathematics. I will trust you – please do not violate that trust by cheating in this course.

Notification of Rights Under FERPA:

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. These rights for students, parents and school officials can be viewed at http://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html.

No Recording Policy

Only the instructor may record class sessions. These will be available in Moodle, and are only for students enrolled in this course. Unauthorized recording of online class meetings is not allowed, to include screen shots that include identifiable information of any person in the session. Not only is the delivery of course content the intellectual property of the instructor, but students enrolled in the course have privacy rights. Unauthorized recording and distribution of online courses may violate federal law.

Tobacco-free/Smoke-free/Vaping-free campus:

UOG is a tobacco-free/smoke-free, vaping/e-cigarette free campus. Thank you for not using tobacco products or e-cigarettes on campus, for helping to fight cancer, and for helping make UOG a healthy learning and living environment.

Disclaimer:

This syllabus is subject to change. By staying registered in this course, you accept the terms of this syllabus.

Welcome!

AND FINALLY...Welcome to MA301! We have a lot to cover this semester, so let's get started. ☺

MA301 – Tentative Schedule – Fañomnåkan 2022

Weeks 1 – 2	Introduction; mathematical models and basic differential equations
Weeks 3 – 5	First order differential equations; *Test 1*
Weeks 6 – 9	Second order linear equations, mechanical vibrations; *Test 2*
Week 10	Spring Break
Weeks 11 – 12	Higher order linear equations
Weeks 12 – 14	Systems of first order linear equations; *Test 3*
Weeks 15 – 17	Laplace transform, series solutions, nonlinear differential equations; *Final Exam*

(This is a tentative schedule, and is subject to change, should a topic require more or less time in class.

MA301 – Student Learning Outcomes

Ever wondered why we require certain courses for general education, or for a given major, or as a prerequisite for another course? Read on below to see what the MA301 student learning outcomes are (what you should expect to learn in this course), how they tie into the Math Program Learning Outcomes, and how they tie into the bigger picture – the University's Institutional Learning Outcomes.

UNIVERSITY OF GUAM
UNIBETSEDÅT GUAHAN

COLLEGE OF NATURAL & APPLIED SCIENCES
Division of Mathematics & Computer Sciences

Institutional Expected Student Learning Outcomes:
UOG Expected Student Learning Outcomes December 2008

Some of the expected fundamental knowledge, skills, and values that the University of Guam student will have demonstrated upon completion of any degree are:

ILO1: Mastery of critical thinking & problem solving
ILO2: Mastery of quantitative analysis
ILO3: Effective oral and written communication
ILO4: Understanding & appreciation of culturally diverse people, ideas & values in a democratic context
ILO5: Responsible use of knowledge, natural resources, and technology
ILO6: An appreciation of the arts & sciences
ILO7: An interest in personal development & lifelong learning

Math Program Learning Outcomes:

MA PR-1: *demonstrate critical thinking*, *problem solving skills* and ability to use mathematical methods by *identifying, evaluating, classifying, analyzing, synthesizing* data and abstract ideas in various contexts and situations.
MA PR-2: *exhibit a sound conceptual understanding* of the nature of mathematics, and *demonstrate advanced mathematical skills* in mathematical analysis, modern algebra and other mathematical discipline(s).
MA PR-3: *argue and reason* using mathematics, *read, create* and *write down* logically correct mathematical proofs, *use exact mathematical language* and *communicate mathematics efficiently* orally, in writing and using information technology tools.
MA PR-4: *apply abstract thinking, mathematical methods, models* and *current practices* in the sciences, including state-of-the-art mathematical software, to solve problems in theoretical mathematics or in a diverse area of mathematical applications.
MA PR-5: *show maturity in mathematical knowledge and thinking* that prepares and encourages students to pursue graduate studies in mathematics or in related fields.
MA PR-6: *demonstrate an appreciation of* and *enthusiasm for* inquiry, learning and creativity in mathematical sciences, a sense of exploration that enables them to *pursue lifelong learning* and *up-to-date professional expertise* in their careers through various areas of jobs, including governmental, business or industrial jobs in mathematics, related sciences, education or technology.
(Note: Math Program Learning Outcomes are undergoing revisions.)

MA301 Course Student Learning Outcomes (SLOs) – Curriculum Mapping

Course SLOs:	**Program Learning Outcomes (PLOs)**	**University Learning Outcomes (ILOs)**	**Method of Assessment**
SLO-1: Demonstrate the ability to use the technology surrounding the study of differential equations.	MA PR-1 MA PR-3 MA PR-4	ILO-1 ILO-2	Questions on homework, quizzes, and tests.
SLO-2: Solve first-order differential equations and those of higher-order.	MA PR-1 MA PR-3 MA PR-4	ILO-1 ILO-2	Questions on homework, quizzes, and tests.

UNIVERSITY OF GUAM
UNIBETSEDÅT GUAHAN

COLLEGE OF NATURAL & APPLIED SCIENCES
Division of Mathematics & Computer Sciences

SLO-3: Use power series, Laplace transforms, and linear algebra techniques to **solve** differential equations.	MA PR-1 MA PR-3 MA PR-4	ILO-1 ILO-2 ILO-5	Questions on homework, quizzes, and tests.
SLO-4: Increase mathematical maturity and ability to read mathematical problems and use it to solve applied problems.	MA PR-1 MA PR-3 MA PR-4 MA PR-5	ILO-1 ILO-2 ILO-5 ILO-6	Questions on homework, quizzes, and tests.
SLO-5: Make use of appropriate computer applications as an aid in calculations.	MA PR-1 MA PR-3 MA PR-4	ILO-1 ILO-2 ILO-6	Questions on homework, quizzes, and tests.

(Note: Student Learning Outcomes for MA301 are undergoing revisions.)