

MT232 Calculus and Analytic Geometry II

DONNELLY COLLEGE

Spring, 2018

MTWRF 12:00-12:50pm

Room 511

5 Credit Hours

INSTRUCTOR INFORMATION:

Name: Dhuha Shareef

Office: 405

Office hours: MTWRF 10:00-10:50 am

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COURSE DESCRIPTION: This is the second of a three-course sequence concerned with calculus. It is a continuation of MT 231. Topics include applications of the definite integral, techniques of integration, improper integrals, sequences and series, power series, Taylor series and convergence, conic sections, parametric and polar curves, and infinite series.

PREREQUISITES: C or better in MT 231 Calculus I.

REQUIRED TEXTBOOK & SUPPLIES: Text – CALCULUS Early Transcendental, 10h Ed, by Anton, required

Graphing calculators are allowed on daily basis (not on tests and quizzes) are available for \$20 rental, Check below under general Information about calculators.

PHILOSOPHY OF GENERAL EDUCATION:

Donnelly College has consistently maintained a strong commitment to the liberal arts and sciences as a foundation for a complete education. The faculty strongly believes that the liberal arts and sciences provide the context through which students can engage with the larger questions about students' place in the world and their pursuit of truth. Therefore, the College's general education requirements are designed to ensure that liberal arts and sciences graduates develop a breadth of content knowledge and the skills and abilities which will enable them to become educated participants in a diverse global community.

DONNELLY COLLEGE LEARNING OUTCOMES:

1. Communication Skills: Students will communicate effectively in writing and speaking.
2. Technology and Information Literacy Skills: Students will demonstrate proficiency in information literacy skills.
3. Symbolic Problem Solving: Students will demonstrate competency in qualitative and quantitative problem solving.
4. Analytical Thinking: Students will employ reflective thinking to evaluate diverse ideas in the search for truth.
5. Personal and Interpersonal Skills: Students will develop an understanding across cultural differences locally, nationally, and internationally.
6. Academic Inquiry: Students will engage independently and effectively in lifelong learning.
7. Values: Students will demonstrate moral and ethical behavior in keeping with our Catholic identity.

PROGRAM LEARNING OUTCOMES: Associate of Science (AS), Liberal Arts

In addition to the general education learning outcomes – communication skills, technology and information literacy skills, symbolic problem solving, analytical thinking, personal and interpersonal skills, academic inquiry, and values – upon successful completion of the Associate of Science in Liberal Arts degree, the graduate should be able to demonstrate:

1. Proficiency and creativity in written and verbal communication.
2. Effective use of current technology in support of academic work.
3. Proficient use of qualitative and quantitative methods in problem solving.
4. Critical and Analytic thinking across a range of disciplines.
5. A commitment to ethics and integrity in academic and professional relationships, within the community and the environment.
6. Use of the scientific method.

STUDENT LEARNING OUTCOMES: Students learning outcomes for calculus II : SLO's:

1. Apply techniques of differential and integral calculus to inverse trigonometric functions and parametric and polar equations.
2. Solve applied mathematical models of first order differential equations.
3. Determine convergence of integrals, sequences and series.
4. Use infinite series to approximate functions.
5. Describe algebraic and geometric relationships in both parametric and polar form.

The following is the list of Learning Outcome students will meet, associated with the Donnelly College's and the program's learning outcomes, aligned with application and assessments. Note that the Shaded part will be assessed this semester.

Donnelly College Learning Outcomes	Program Learning Outcomes ¹	Student Learning Outcomes ²	Application and Assessment ³
Students will communicate effectively in writing and speaking.	Students will demonstrate a Proficiency and creativity in written and verbal communication.	2. Solve applied mathematical models of first order differential equations.	Class average of 70% or more on the related problems on the Final Exam.
Students will demonstrate proficiency in information literacy skills.	Students will demonstrate Effective use of current technology in support of academic work.		
Students will demonstrate competency in qualitative and quantitative problem solving.	Students will demonstrate Proficient use of qualitative and quantitative methods in problem solving.	1. Apply techniques of differential and integral calculus to inverse trigonometric functions and parametric and polar equations.	Class average of 70% or more on the related problems on the Final Exam

Students will employ reflective thinking to evaluate diverse ideas in the search for truth.	Critical and Analytic thinking across a range of disciplines.		
Students will develop an understanding across cultural differences locally, nationally, and internationally.	Students will demonstrate A commitment to ethics and integrity in academic and professional relationships, within the community and the environment		
Students will engage independently and effectively in lifelong learning.	Students will demonstrate Use of the scientific method.	3. Determine convergence of integrals, sequences and series. 4. Use infinite series to approximate functions. 5. Describe algebraic and geometric relationships in both parametric and polar form.	Class average of 70% or more on the related problems on the Final Exam.
Students will demonstrate moral and ethical behavior			

in keeping with our Catholic identity.			
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General concepts covered on this course:

1. Applied problems in Integral calculus, such as competitions of area, curve length, volume, surface area, and work. Connecting the computational methods established, with the Integration concept based on the notion of Riemann integral.
2. Computing integrals using as appropriate the method of integration by parts the method of partial fractions, methods associated to trigonometric functions, tables of integrals and evaluating the improper integrals.
3. Using the separation of variables method in solving the first order differential Equations in applied mathematical modeling.
4. The sequences, series, geometric series, infinite series and applications of the convergence theorem. Applications on convergence tests (comparison, ratio, and root, alternating series test) in order to decide convergence /divergence /conditional divergence.
5. Taylor polynomial for a function of one variable and using these polynomials as approximations of functions of one variable, and address the issue of error of this approximation. Using Taylor series to model functions of one variable. Developing several methods of computing Taylor series in closed form.
6. The concept of radius of convergence of power series, and application on the convergence tests to compute it in concrete situations.
7. Parametrically Defined functions, and the translation between parametric equations and other ways of describing a function. Sketching the graph of a various parametrically defined functions, and to sketching the graphs of functions in polar coordinates. Adopting some of the topics studied for functions of one variable to functions defined parametrically: tangent lines, arc length, and competitions of area.
8. Analyzing the main types of conic sections and sketch them.
9. The rectangular coordinate system in 3- space and the use of vectors.

COURSE REQUIREMENTS:

Exams: There will be five chapter tests and a cumulative final exam. Tests will be given as is indicated in the class schedule. . Final exam is mandatory; any student who does not take the final exam will receive an F. You may not use notes when testing. Basic calculators may be used.

Make-up Exams: You may make up one test. In order to be allowed to make up a test you must call or e-mail me BEFORE the start of the test. You must have a valid reason and give it at this time (“I’m not ready” is NOT a valid reason.) If you do not provide prior notice, you must provide documentation (doctor’s note, etc.) as to why you could not take the test. Unless there are extenuating circumstances, all tests must be made up within 48 hours of the scheduled test time. It is up to you to schedule the test.

Since the points distribution are varies, the following rubric will be used to evaluate individual problems on the chapter tests and the final exam.

No credit points awarded	Quarter credit awarded	Half credit awarded	Three quarters credit awarded	Full credit points awarded
Answer is not correct and no work is shown or work shown is not labeled or not readable OR answer is correct but the directions were not followed.	Work is shown (as appropriate), work is neat and readable, answer is not correct but work shown indicates the student had some idea of what was to be done.	Work is shown (as appropriate), work is neat and readable, answer is not correct but work shown indicates minimal computational error(s)	Work is shown (as appropriate), work is neat and readable, answer is correct but has not been simplified as much as possible or answer differs by the sign.	Work is shown (as appropriate), work is neat and readable, answer is correct and has been simplified as much as possible.

Retests: There are no retests.

Quizzes: There will be 6 quizzes. . The top four quizzes with form a 40points

Written Homework: will be assigned regularly for every section covered. It is strongly recommended to work on the homework related to a given section as soon as the section has been covered in class. The assigned homework will be averaged to make 60 points, both quizzes and homework will be summed to form a one test

grade. This grade along with five chapter test grades and the grade from the cumulative final will be averaged together to make the final grade.

GRADING POLICY:

Five Chapter Tests	500
Homework 60pts & Quizzes 40pts	100
Final Comprehensive	100

Total	700 points

Letter Grade
A ≥ 90
$80 \leq B \leq 89$
$70 \leq C \leq 79$
$69 \leq D \leq 60$
F ≤ 59

GRADING SCALE: The total course grade

A: 90-100%	630 - 700 points
B: 80-89%	560 - 629 points
C: 70-79%	490- 559 points
D: 60-69%	420- 449 points
F: below 60%	419 and below

CALCULATORS POLICY:

Scientific Calculators usually will be allowed on tests or quizzes._

Graphing Calculators will not be used during tests or quizzes unless the instructor specifically allows.

Calculators on your cell phones, iPads, and any Electronic communicating devices may never be used on tests and quizzes.

No student may SHARE a calculator with anyone in class during a test or quiz. If a student forgets his/her calculator, the student may go to the instructor's office BEFORE class and borrow one, or the student must go without.

CELL PHONE POLICY: Cell phones should be turned off (or placed on vibrate) and should be kept in your book bag or on the floor (not on the desk or in your lap) during class.

ACADEMIC INTEGRITY: “...Academic integrity is to be maintained at all times to insure genuine educational growth. Cheating and plagiarism in all forms, therefore, will be subject to disciplinary action. Serious infractions will be reviewed by an ad hoc committee, appointed by the appropriate dean. Appropriate sanctions will be imposed.”

PLAGIARISM: Plagiarism – the appropriation or imitation of the language or ideas of another person and presenting them as one’s original work – sometimes occurs through carelessness or ignorance. Students who are uncertain about proper documentation of sources should consult their instructors.

ACCOMMODATIONS: In compliance with the Americans with Disabilities Act, Donnelly College will make every attempt to provide equal access for persons with disabilities. Students in need of accommodations must request them in writing from the Vice President of Academic Affairs.

CIVILITY & DECORUM: As noted in its Code of Conduct, Donnelly College is committed to maintaining an overall atmosphere of civility and respect. Civility and decorum both inside and outside the classroom are fundamental foundations of the values at Donnelly College. Classroom discussions and interactions outside the classroom will at all times be focused on the learning process and should always be respectful of both students and faculty. In open discussions of ideas and issues, disagreements should focus on ideas and facts. Name calling and assaults (either in person or on-line) will not be tolerated. Should any problems occur, the instructor should be notified immediately. Those who do not comply with civility and decorum requirements may be subject to a grade reduction and/or other sanctions up to and including dismissal from Donnelly College.

ATTENDANCE POLICY: Students are expected to attend and participate in classes. Students should notify the instructor in advance to request that an absence be excused, and check if any arrangements are needed. Successive unexcused absences are subject to withdraw the student from class.

WITHDRAWAL FROM COURSES OR FROM SCHOOL: It is the responsibility of the student to withdraw from class. If a student decides to withdraw from a class, ideally, they should see an advisor and the financial aid staff before taking the

withdrawal form to the Registrar's office for processing. However, any verifiable contact (e-mail, fax, phone, mail, etc.) with authorized college personnel expressing the student's intent to withdraw from a class will be honored.

If students withdraw before they have earned their financial aid, they will owe Donnelly College a debt for the unearned portion of the financial aid as well as for any unpaid balances (subject to the College's refund policy). Not attending class is not a withdrawal from class.

Donnelly College reserves the right to withdraw a student from class(es) if the student does not meet their financial obligations, including two missing or incomplete payments, or loss of financial aid. Faculty may initiate an administrative withdrawal on the basis of non-attendance. In extreme circumstances (i.e. a disciplinary problem), the Vice President of Academic Affairs may initiate an administrative withdrawal. The student remains responsible for the tuition owed in this instance.

The deadlines for withdrawing from classes are as follows:

14 to 16 weeks	3 weeks before the end of the class
6 to 8 weeks	7 weekdays before the end of class
4 to 5 weeks	4 weekdays before the end of class
Less than 4 weeks	Withdrawals are not allowed

Withdrawal deadline dates will be published in the academic calendar.

TENTATIVE COURSE CALENDAR:

The schedule is subject to change based on the progress or needs of the class:

Date	Day	Sections	Suggested Homework problems
1/16	WK1 /T	Ch6:6.1, Area between two curves	1,3,5,7,10,13,15,19,20,21,33,35,36,45,47,49
1/17	W	6.2 Volumes by Slicing; Disk and Washer Methods	1,2,3,11,23,35,37,39,41,47,48,49,55a,57,61,62
1/18	R	6.3 Volumes by Cylindrical Shells	1,3,4,5,7,9,12,27,30
1/19	F	6.4 Length of Plane Curve	1,3,5,7,13,15,17,20,21,23,25
	F		
1/22	Wk2/ M	6.5 Area of a Surface Revolution	1,3,5,7,9,11,17,18,25,26,30
1/23	T	6.6 Work	1,3,5,7,9,15,17,18,19,21,22,23,25,27,28
1/24	W	6.6 Continue	
1/25	R	6.7 Moments, Centers of gravity	1,3,5,7,9,13,19,25,27,39,40
1/26	F	7.1.7.2 Integration by Parts	7.1 (1-31 odd) and 7.2 (1,3,7,13,15,19,23,27,29,35,47,55,59,61)
1/29	Wk3/ M	Chapter 6 Test	
1/30	T	7.2 Integration by Parts to be continued	1,5,9,11,13,17,21,15,29,33,35,39,45,47,51,59
1/31	W	7.3 Integrating Trigonometric Functions	
2/1	R	CATCH UP	
2/2	F	7.3 Integrating Trigonometric Functions continue	
2/5	Wk4/ M	7.4 Trigonometric Substitutions	1,5,7,11,17,23,25,31,33,39
2/6	T	CONTINUED	1,3,5,7,9,13,17,23,27,29,33,51
2/7	W	7.5 Partial Fractions	1,11,17,23,25,27,33,37,39,47,51,57,65,71,87
2/8	R	7.6 Tables of Integrals	
2/9	F	7.8 Improper Integrals	1,3,7,11,13,15,17,19,23,27,37,54,55,71
2/12	Wk5/ M	Improper Integrals	
2/13	T	Quiz ch7	
2/14	W	Ch8: 8.1 Mathematical Modeling with differential Equations,	1,3,9,11,13,15,17,19,23,25,27,29,31,33,35
2/15	R	8.2 Separation of Variables	1,3,5,11,13,15,17,23,31,35,37,39,46,59
2/16	F	Catch up	

2/19	Wk6/ M	Test Ch. 7 & 8	
2/20	T	Chapter 9: 9.1 Sequences	1,(5-21)odd,23,27,37,41,45.
2/21	W	CONTINUED	
2/22	R	9.2 Monotone Sequences	1,3,5,7,9,11,17,19,21,23,25,28,29
2/23	F	Monotone Sequences	
2/26	Wk7/ M	9.3 Infinite Series	1-15 odd, 22,23,29,31
2/27	T	Infinite Series	
2/28	W	CATCH UP	
3/1	R	9.4 Tests of Convergence	
3/2	F	9.4 Convergence Tests Continue	1-25 odd
3/5	Wk8/ M	9.5 Comparison Test	1-19 odd,25-41 odd
3/6	T	9.5 Root Test, Ratio Test	
3/7	W	CATCH UP	
3/8	R	9.6 Alternating Series	1-27 odd,33-43 odd
3/9	F	Alternating Series	
		12-17 March	Spring break
3/19	Wk9/ M	9.7 Taylor Polynomials	1,3,5,7,11,15,17,19,21,23,25,35,37,43
3/20	T	Taylor Polynomials	
3/21	W	CATCH UP	
3/22	R	9.8 Power Series	1,5,9,11,13,15,17,19,21,29,31,35,39,43,45, 49,54
3/23	F	Power Series	
3/26	wk10 M	9.9 Convergence of Power Series	2,3,7,11,13,17
3/27	T	Convergence of Power Series	
3/28	W	9.10 Integrating and differentiating Power Series	1,5,7,9,13,19,21,25,27,31,35
3/29	R	10.1 Parametric Equations	1,5,11,13,17,19,23,47,51,55,59,65,67,71,73 .
3/30	F	Easter Break	No School
4/2	Wk1 1M	Test Chapter 9	
4/3	T	10.2 Polar Coordinates	1,5,9,11,15,21,23,25,29,34,39,45,57,61,76
4/4	W	Polar Coordinates	
4/5	R	10.3 Tangents, lengths, Area	1,3,7,19,21,27,29,33,35,39,43,51

4/6	F	Tangents,lengths, Area	
4/9	Wk1 2M	10.4Conic Sections	10.4/1,5,7,10,13,14,15,20,25,31,35,48,50,59
4/10	T	10.5Conic Sections	10.5 /1,5,7,11,13,19,23,27,37
4/11	W	Catch up	
4/12	R	10.6 Conic Sections	10.6/1,5,7,11,13,19,23,27,37
4/13	F	/Catch up	
4/16	Wk1 3M	Test Ch 10	
4/17	T	11.1 Vectors in 3-dimentionions	3,10,13,15,23,27,31,33,37,39,47
4/18	W	Continued	Last day to withdraw from class
4/19	R	11.2 Vectors in 3-dimentionions	1-45 odd
4/20	F	Continued	
4/23	Wk1 4M	11.3 Dot Product; Projections	To be announce in class
4/24	T	11.4 Cross Product	To be announce in class
4/25	W	CATCH UP	
4/26	R	11.5 Parametric Equations of Lines	1,3,5,7,9,17,21,25,29,33,37,39,41,43,49,57
4/27	F	Quiz ch 11	
4/30	W15 M	Ch11 Test	
5/1	T	Final Comprehensive Review	
5/2	W	Final Comprehensive Review	
5/3	R	Final Comprehensive Review	
5/4	F	Final Comprehensive Review	
5/7	W16 M	Final Exam at 8:00-9:40 am	