MATH 2414, Spring 2023
Calculus II

Instructor Information	
Professor:	Dr. Stephen Graves
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The preferred method of contact is via Canvas.
uttyler.instructure.com

Class Meeting Times

Section	Days	Times	Location
003	MoWeFr	13:25 – 14:40	RBN 4027

Office Hours

MoWeFr 10:15 — 11:15 RBN 4011
Otherwise by scheduled appointment.

1. Course Information

1.1. **Official Course Description.** A study of differentiation and integration of transcendental functions, polar coordinates, techniques of integration, sequences, series, and improper integrals.

1.2. **Course Prerequisites.** A grade of C or better in Math 2413.

1.3. **Important Dates from Academic Calendar.**

Date	Important Event	
9 Jan.	First day of classes	
16 Jan.	*Martin Luther King, Jr. Day*	*(No classes)*
23 Jan.	Census date	
13 – 18 Mar.	Spring break	*(No classes)*
23 Mar.	Withdrawal deadline	
24 – 29 Apr.	*Finals week*	*(No classes)*

2. Course Content

2.1. **Textbook.** The primary textbook will be the source of lecture notes and homework problems; the others are provided so you can have an additional explanation of topics if you need them.

Primary: Essential Calculus, Early Transcendentals, 2nd Edition, James Stewart, ISBN 1-133-11228-0.
Reference: *Openstax Calculus Volume 2* [1]
Reference: *APEX Calculus*[2], by Hartman et al.
Reference: Basically any Calculus textbook on the Open Textbook Library[3]
Recommended: *The 5 Elements of Effective Thinking* by Edward Burger and Michael Starbird ISBN 978-0691156668.
This inexpensive book can totally change how you view learning and I recommend it to anyone who thinks they might struggle with course material, whether or not they're in my classes.

2.2. **Student Learning Outcomes.** Students should be able to successfully:

- Apply the ideas of definite integrals to solve problems of: Areas, under curves and between curves; Volumes of cylindrically symmetric objects; Work, done by a constant or variable force; Other assorted applications
- Apply the techniques of substitution, integration by parts, trigonometric substitution, partial fractions and table of anti-derivatives to evaluate definite and indefinite integrals.
- Describe the meaning of an improper integral. Apply the concepts of limit, convergence and divergence to evaluate some classes of improper integrals.
- Define sequences and series, and determine convergence or divergence of them.
- Find the Taylor and MacLaurin series to represent elementary functions. Apply Taylor or MacLaurin polynomials to the integration of functions not integrable by conventional methods.
- Apply the ideas of polar coordinates to find areas, lengths of curves and representations of conic sections.
- Persuasively communicate mathematical ideas using clear and concise mathematical language, including terminology, notation and grammar.

3. Course Policies

3.1. **Academic Honesty.** *All work submitted must be your own*. If this is determined not to be the case, you will be referred to the Director of Judicial Affairs, with a consequence appropriate to the level of the infraction. You will be reminded of the UT Tyler Honor Code on every exam.

Submitting the homework or lecture notes of another student is **plagiarism** and will result in an earned grade of 0 **for the category**, not just the assignment. Cheating on an exam will result in an F for the **course**. Posting copyrighted material to the internet without the prior written permission of the copyright holder is **illegal**.

3.2. **Civil Environment.** The free exchange of ideas is a central part of a university education. Class will be conducted in a polite and professional manner and I expect students to behave politely and professionally. *Disruptive behavior will not*

be allowed and is judged at my sole discretion. Persistent incivility will result in your removal from the classroom.

3.3. **Canvas & Email.** You are expected to check Canvas at least daily, and also expected to check your university email. **All at-home work will be submitted via Canvas**.

3.4. **Personal Electronics.** Students are required to have access to a device capable of accessing Canvas and a device capable of scanning hand-written work for upload to Canvas. **Calculators are not permitted in this class.** You are expected to keep all personal electronics (phones, laptops, tablets, headsets, earpods, etc.) stowed in your bag during class *unless actively being used for class purposes*.

3.5. **Late & Missed Work.** Late work will not be accepted. Missed lecture notes and homework will count as 0s. In the event that a student misses a single in-class exam, the final exam grade will increase to cover the missing points. Students missing more than one in-class exam fail the course.

4. University Policies

The University has many policies required to be included on syllabi. As these policies can change, please find the most recent version online.[1]

5. Course Structure

The course content will be tentatively organized by week in Canvas modules; this is subject to change as our use of class time necessitates. Your grade will be calculated in **percentage points (PP)**: lecture notes (5 PP), homework (5 PP), and exams (90 PP).

5.1. **Grade Scale.** Student letter grades will be recorded based upon their earned percentage points (PP). The grade scale will be no stricter than the standard:

PP Range	$[0, 60]$	$(60, 70)$	$[70, 80)$	$[80, 90)$	$[90, \infty)$
Letter	F	D	C	B	A

5.2. **Lecture Notes, 5 PP.** Students who consistently attend class and participate by writing notes and asking questions outperform students who do not. In order to encourage attendance, you will be required to scan and upload your handwritten course notes before 23:59 on the same day as class. *When you miss class, make sure to obtain lecture notes **from a classmate** and submit them before the deadline. Notes will not be provided by the instructor.* Each day's notes will be graded as a 0 (no meaningful notes), 1 (halfway complete and meaningful notes), or 2 (complete and meaningful notes). The notes *do not need to be an exact transcript of class to be complete*, but must contain all meaningful ideas from class.

There are 36 days for which notes can be submitted; at 2 points each that totals 72 points. Your grade x will be taken out of 64 points, and you will earn $5x/64$ PP for lecture notes.

> *Extra Credit.* If you receive $x > 64$ points from lecture notes, you will receive an additional $1/8$ PP per point above 64, for a maximum of 6 PP.
> This makes the formula $5 + (x - 64)/8$.

5.3. **Homework, 5 PP.** There is no practice as reliable as working homework to help you learn mathematics, so I will assign homework regularly. You are encouraged to work together and even more strongly encouraged to contact me when you struggle. Homework must be written by hand, scanned, and uploaded to Canvas before 23:59 on the due date. Homework will be graded for *completeness only*, on a similar scale as lecture notes: 0 for minimal completion, 1 for at least half completion, and 2 for full completion. A tentative homework schedule appears at the end of this syllabus.

There are 36 homework assignments. Your grade x will be taken out of 72 points, and you will earn $5x/72$ PP for homework.

5.4. **Exams, 90 PP.** There will be 4 in-class exams as well as a final exam. In-class exams dates are listed on the Schedule at the end of this syllabus and will be posted to Canvas. The Final Exam is scheduled by the University administration and is likely to be Monday, 24 April from 12:30 – 14:30; however this class meets in a non-standard timeslot, so we may find our exam moved to a different time.

In-class exams each contribute 15 PP towards your final grade, while the final contributes 30 PP. All exams will be comprehensive, but will be skewed toward the newer material covered since the last exam.

Students who do not take the final earn an F in the course.

> *Extra Credit.* A student who takes all exams and earns all nonzero scores will receive an additional 1 PP towards their grade.

5.5. **Tentative Schedule of Topics.** A tentative schedule of topics appears on the final page of the syllabus, along with suggested practice problems and the assigned homework.

[1] Usually at `https://www.uttyler.edu/academic-affairs/files/syllabuspolicy.pdf`

Class	Date	Class Schedule	Suggested Drill Problems	HW #	Problems	Due	Date
M	Jan 9	Review, 6.1 Integration by Parts	5.5: 7-52, 6.1: 3-16			M	Jan 9
W	Jan 11	6.1 Integration by Parts	17-30, 35-40, 43-45	HW 1	5.5 #11, 13, 19, 23, 51; 6.1 #3, 7, 11, 13, 15	W	Jan 11
F	Jan 13	6.2 Trig Integrals and Substitution	1-38, 65, 66	HW 2	6.1 #17, 19, 21, 23, 25, 29, 35, 43	F	Jan 13
M	Jan 16	**NO CLASS**					
W	Jan 18	6.2 Trig Integrals and Substitution	39-64, 67, 68	HW 3	6.2 #3, 5, 9, 13, 17, 19, 25, 33, 35, 65	W	Jan 18
F	Jan 20	6.3 Partial Fractions	1-42, 44, 46, 47	HW 4	6.2 #41, 43, 45, 47, 51, 55, 56, 59, 63, 67	F	Jan 20
M	Jan 23	6.3 Partial Fractions		HW 5	6.3 #6, 7, 9, 11, 17, 23, 27, 29	M	Jan 23
W	Jan 25	Integral Project		HW 6	6.3 #33, 35, 37, 39, 41	W	Jan 25
F	Jan 27	6.6 Improper Integrals	1-3,5-22	HW 7	Integration Triples Worksheet	F	Jan 27
M	Jan 30	6.6 Improper Integrals	23-38,41-51,54,57-62	HW 8	6.6 #5, 7, 9, 11, 13, 15, 17, 19, 21	M	Jan 30
W	Feb 1	Review	1-50, 55, 56, 64	HW 9	6.6 #25, 27, 29, 31, 41, 43, 49, 51	W	Feb 1
F	Feb 3	**EXAM 1**		HW 10	At least 10 extra problems you worked for the Exam	F	Feb 3
M	Feb 6	7.1 Areas between Curves	1-21,28,31-41			M	Feb 6
W	Feb 8	7.2 Volumes	1-18,27,28,31-44,47,48,52-54	HW 11	7.1 #3, 9, 11, 13, 15, 19, 28, 31, 35, 41	W	Feb 8
F	Feb 10	7.3 Volumes by Cylindrical Shells	1-26, 29-42	HW 12	7.2 #5, 7, 9, 13, 15, 17, 31, 32, 33, 37, 39	F	Feb 10
M	Feb 13	Volume Project		HW 13	7.3 #5, 11, 13, 15, 17, 19, 29, 35, 37, 41	M	Feb 13
W	Feb 15	7.4 Arc Length	1,2,7-18,28,29,31-35	HW 14	Volume Worksheet	W	Feb 15
F	Feb 17	7.5 Area of a Surface of Revolution	5-16, 19-23, 25	HW 15	7.4 #7, 9, 11, 13, 15, 17, 27, 29, 35	F	Feb 17
M	Feb 20	7.6 Applications to Physics and Engineering	9-24	HW 16	7.5 #5, 7, 9, 11, 13, 14, 15, 19, 23, 25	M	Feb 20
W	Feb 22	7.6 Applications to Physics and Engineering	25-34, 39-46	HW 17	7.6#9, 10, 11, 12, 13, 15, 16, 17, 18, 19	W	Feb 22
F	Feb 24	8.1 Sequences	3-32	HW 18	7.6#25, 27, 29, 31, 32, 33, 39, 41, 43, 45	F	Feb 24
M	Feb 27	Review		HW 19	8.1#3, 7, 9, 11, 15, 19, 24, 25, 29, 31	M	Feb 27
W	Mar 1	**EXAM 2**		HW 20	At least 10 extra problems you worked for the Exam	W	Mar 1
F	Mar 3	8.2 Series	7-28, 31-37, 39-40			F	Mar 3
M	Mar 6	8.3 Integral and Comparison Test	2-32, 38-48	HW 21	8.2 #9, 11, 13, 17, 21, 25, 31, 33, 35, 39	M	Mar 6
W	Mar 8	8.3 Integral and Comparison Test		HW 22	8.3 #3, 5, 7, 9, 11, 13, 15, 17, 19, 20	W	Mar 8
F	Mar 10	8.4 Other Convergence Tests	2-45	HW 23	8.3 #21, 23, 25, 27, 28, 29, 31, 39, 41, 43	F	Mar 10
M	Mar 13	**SPRING BREAK**				M	Mar 13
W	Mar 15	**SPRING BREAK**				W	Mar 15
F	Mar 17	**SPRING BREAK**				F	Mar 17
M	Mar 20	8.4 Other Convergence Tests		HW 24	8.4 #3, 5, 7, 9, 11, 13, 15, 17, 18, 19	M	Mar 20
W	Mar 22	Series Project		HW 25	8.4 #21, 23, 25, 27, 29, 31, 33, 39, 43, 45	W	Mar 22
F	Mar 24	8.5 Power Series	3-25,31-36	HW 26	Series Worksheet - at least 15 problems	F	Mar 24
M	Mar 27	8.6 Representing Functions as Power Series	3-20,25-33,39-42	HW 27	8.5 #5, 7, 8, 11, 15, 19, 22, 23, 31, 35	M	Mar 27
W	Mar 29	Review		HW 28	8.6 #5, 8, 13, 15, 19, 25, 27, 29, 39, 41	W	Mar 29
F	Mar 31	**EXAM 3**		HW 29	At least 10 extra problems you worked for the Exam	F	Mar 31
M	Apr 3	8.7 Taylor and Maclaurin Series	3-36,39-68,70			M	Apr 3
W	Apr 5	8.8 Applications of Taylor Polynomials	3-20, 23	HW 30	8.7 #5, 9, 13, 17, 25, 31, 33, 41, 53, 55, 59	W	Apr 5
F	Apr 7	**GOOD FRIDAY - NO CLASS**				F	Apr 7
M	Apr 10	9.1 Parametric Curves	1-23,25,27,31,32,34,36,38	HW 31	8.8 #3, 5, 7, 11, 13, 14, 15, 17, 19, 23	M	Apr 10
W	Apr 12	9.2 Calculus with Parametric Curves	1-16,21,23-32,37-48,54	HW 32	9.1 #4, 7, 11, 13, 17, 22, 25, 27, 31, 38	W	Apr 12
F	Apr 14	9.3 Polar Coordinates	1-56	HW 33	9.2 #5, 9, 13, 21, 24, 25, 27, 37, 41, 44	F	Apr 14
M	Apr 17	9.3 Polar Coordinates		HW 34	9.3 #5, 11, 13, 19, 21, 23, 25, 27, 29, 31	M	Apr 17
W	Apr 19	9.4 Areas and Lengths in Polar Coordinates	1-38	HW 35	9.3#35, 39, 41, 43, 46, 47, 49, 51, 53, 55	W	Apr 19
F	Apr 21	**EXAM 4**		HW 36	9.4 #5, 7, 11, 15, 21, 23, 25, 29, 31, 35	F	Apr 21
M	Apr 24					M	Apr 24
W	Apr 26	**FINALS WEEK**				W	Apr 26
F	Apr 28					F	Apr 28

Notes

1. https://openstax.org/details/books/calculus-volume-2
2. http://www.apexcalculus.com or https://opentext.uleth.ca/apex-calculus/
3. https://open.umn.edu/opentextbooks/subjects/calculus