TTU – MATH 2450 – Calculus III with Applications

Section / Time / Location:	020 / MWF 1:00-1:50pm / PETRE 121 020a / T 3:30-4:20pm / AGED 102	**Instructor:**	**Josh Engwer**
		Coordinator:	**Eugenio Aulisa**
		E-mail:	josh.engwer@ttu.edu
		Website:	http://www.myweb.ttu.edu/jengwer or Google™ "josh engwer"
Office Hours:	TR 11:30am - 2:30pm (or by appt.)	**Office:**	MATH 003A
Textbook:	*CALCULUS* 6^{th} Ed by Smith, Strauss, Toda (SST)		(5^{th} edition by [SBS] is OK)

Prerequisites: Any one of **[A]-[B]** below. (Legend: / = 'or', + = 'and', :X = '**at least** a grade/score of X')

[A] MATH 1352/1452:C **[B]** Departmental permission (based on transfer or exam) [i.e. **Calculus II**]

Course Content: (not exhaustive, but the main themes – hours are approximate)

- (2 hrs) Ch9 : **Vectors**: Algebra, Dot Products, Cross Products, Projections (REVIEW)
- (1 hr) Ch9 : **Parametric Curves in** $\mathbb{R}^2$: Conversion of Cartesian or Polar Forms → Parametric Forms
- (4 hrs) Ch9 : **Solid Analytic Geometry in** $\mathbb{R}^3$: Lines, Planes, Quadric Surfaces
- (4 hrs) Ch10: **Vector Functions in** $\mathbb{R}^3$: Algebra, Calculus, Kinematics, **TNB**-frame, Arc Length, Curvature, Torsion
- (2 hrs) Ch11: **Multivariable Functions:** Surfaces, Level Curves, Level Surfaces, Domains, Limits, Continuity
- (10 hrs) Ch11: **Partial Derivatives:** Total Differentials, Chain Rules, Gradients, Tangent Planes, Optimization
- (6 hrs) Ch12: **Double Integrals:** Setup/Computation in Rectangular & Polar Coord's, Area, Volume, Surface Area
- (4 hrs) Ch12: **Triple Integrals:** Setup/Computation in Rectangular, Cylindrical & Spherical Coord's, Volume
- (2 hrs) Ch12: **Multiple Integrals**: Change of Coordinates (Jacobians)
- (6 hrs) Ch13: **Vector Fields**: Div, Curl, Line Integrals, Surface Integrals, Flux Integrals
- (7 hrs) Ch13: **Key Theorems**: Green's Theorem, Stokes' Theorem, Gauss' Theorem, Applications

Final Grade Assessment: Attendance – 5%, Homework – 10%, 3 x Midterm Exams (20% each) – 60%, **Final Exam – 25%**

Final Grade Scale: A: 100%-90% B: 89%-80% C: 79%-70% D: 69%-60% F: 59%-0%

Attendance Policy: Attendance will be taken, and it's your responsibility to sign your name on the roll sheet each class.

Homework: All homework (HW) is assigned & completed online through **WeBWorK**.
You should work HW problems by pencil & paper to realize the amount of work to be expected for similar problems on exams.

Midterm Exams: In-class, **closed-'everything'** (i.e. no books/notes, no formulas, no calculators/phones/PC's/tablets, ...)
All midterm exam questions will be free-response, not multiple choice!
Sufficient correct work must be shown to receive full points on exam problems – **answers without work earn no credit!**
Be prepared to show a photo ID (ideally, your RaiderCard)

Final Exam: Comprehensive, departmental, **Bluebook required**, **closed-'everything'**.
It will be administered on **Tuesday, December 9^{th}, 10:30am - 1:00pm in room TBA**.

Make-up Policy: **Homework will not be accepted late – hence, no make-ups for homework.**
There will be no make-up exams given except for observance of a religious holiday.
If a midterm exam is missed for a **legitimate documented** reason, then the Final Exam score will replace it.
Some legitimate excuses (with documentation): university field trip, severe illness, death in the family, ...
Some non-legitimate excuses: "I already bought plane tickets", "I was stuck in traffic", "I overslept", ...

KEYS TO SUCCESS: Show up. Work problems. Seek help when stuck. Show work. Manage time.

I never curve nor accept exam corrections nor drop the lowest exam score nor assign extra credit assignments!

Learning Objectives: MATH 2450 satisfies part of the university Core Curriculum requirement in Mathematics: *"Students graduating from Texas Tech University should be able to demonstrate the ability to apply quantitative and logical skills to solve problems."* It meets the TTU general education student learning outcomes for mathematics that students will:

- Apply arithmetic, algebraic, geometric, statistical and logical reasoning to solve problems.
- Use mathematical and logical reasoning to evaluate the validity of an argument.
- Represent and evaluate basic mathematical and/or logical information numerically, graphically and symbolically.
- Interpret mathematical or logical models such as formulas, graphs, tables and schematics and draw inference from them.

In particular, students will master the concepts of:

- Differentiation and integration needed to solve problems in 3-dimensional space.
- Tangent vectors, normal vectors, and their geometric/physical interpretations.
- Partial derivatives, tangent planes, directional derivatives, gradients, and their computation.
- Three-dimensional integrals and their computation.
- Vector fields, divergence, curl, and their applications to the real world and other sciences.

ADA Accommodation: (from OP §34.22)

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should present appropriate verification from Student Disability Services (SDS) during the instructor's office hours.

For details, contact the **SDS office: (Address) 335 West Hall (Phone) 806-742-2405**.

Religious Holy Day Observance: (from OP §34.19)

- "Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code §11.20.
- A student who intends to observe a religious holy day should make that intention known in writing beforehand.
  A student who is absent for the observance of a religious holy day shall be allowed to take an exam or complete an assignment scheduled for that day within a reasonable time after the absence.
- A student who is excused for a religious holy day observence may not be penalized for the absence.
  However, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

Civility in the Classroom: Students are expected to assist in maintaining a classroom environment conducive to learning.

- No chatting. No newspapers. No periodicals. No music players. Silence phones.
- **When the instructor says "Let's get started," all talking should stop**.
- Students who insist on using a laptop or tablet should sit in the back two rows. Of course, the device should be silenced.

Academic Integrity: (from OP §34.12)

It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. **Any attempt of scholastic dishonesty by the student is liable to serious consequences, possibly suspension**.

Scholastic Dishonesty: "Scholastic dishonesty" includes (but is not limited to): **Cheating** & **Misrepresenting Facts**

Cheating: "**Cheating**" includes (but is not limited to):

- Copying from another student's exam
- Using unauthorized materials during an exam
- Collaborating with another student during an exam
- Leaving the exam room without submitting the exam for grading
- Taking an exam for someone else

Misrepresenting Facts: "**Misrepresenting facts**" includes (but is not limited to):

- Providing false or misleading information in an effort to receive a postponement or an extension on an exam or HW.