Math 2530 **Calculus III Syllabus Spring 2021** Meets Online Mon &Wed 4:30-6:20p UNM-Valencia

Prerequisite: C or better in Calculus II/Math 1522

Instructor: Clifton Murray. Available-to-Help hours via email or Zoom: Wed 10:30a-12:30p; Thurs 11:45a-12:15p, 1:15-2:45p, 4:15-6:15p. wcmurray@unm.edu

Required Materials: Computer with Internet access.
Textbook, Thomas' Calculus, 14th ed., by Weir & Hass.
Scientific Calculator (capable of powers-of-ten notation, and having sin, cos, tan functions); if it is a Graphing type, that will be useful later in the course.

Mode of Online/Remote: Zoom. A link will be emailed to students just before each meeting.

Attendance will be taken. After four accumulated absences, the student may be dropped from the course. If you know you have work or other essential/unavoidable conflict, see the instructor to decide whether/how you can remain in the course.

Disabilities: If you have a physical disability which could interfere with learning in an online environment, contact UNM-Valencia Student Services, telephone 505-925-8560.

Academic dishonesty as defined in the UNM-Valencia catalog includes copying work from other students or, by implication, having another student do the work for you. Any student found to have done this on tests or homework is subject to disciplinary action, ranging from a reduced or failing grade for the work &/or the course to dismissal from the University.

Persistent disruptive behavior which interferes with other students' education—such as loud, distractive talking, insulting classmates or the instructor, or other disruptive behavior-- will result in the offenders' being dropped from the course. In a remote/online learning context, being sensitive and respectful of others ("Netiquette") includes muting your mic when not engaged in class-relevant discussion (even a pencil writing on paper can be distracting if picked up by your mic), and not using all caps when chatting or emailing, since that could be interpreted as yelling.)

Any *sexual misconduct or gender discrimination* observed by or reported to a UNM Faculty member, TA, or GA must be reported to the UNM Office of Equal Opportunity and the Title IX Coordinator. For information regarding what constitutes sexual misconduct, see https://policy.unm.edu/university-policies/2000/2740.html

Homework assignments are taken from textbook end-of-section exercises. The daily assignments are on the class calendar (separate from this document). Write out your work by hand, then photo or scan and send them to my unm email (listed near top of this page.) Group the problems as on calendar—that is, turn problems in grouped by the Day they are listed on the calendar—Not by section. When solving a problem, **clearly separate individual main problems, with either whitespace or a bold line.** Make the main problem number super-BIG…like, #3, #17, #23a,b,c…(don't make the a,b,c…big.) This demarcation of each Main prob # helps me find the problems and grade them fast, which I need to do—I grade a lot of homework. (btw, I am making homework a larger % of your grade than in the past, b/c of this online mode of instruction.)

Sketches are required on all homework problems where appropriate—problems referring to a physical situation, problems referring to a geometric figure, other.

Late or Missed Work Tests will occur during class time, as on our Calendar. No makeup tests.
Homework: Late 1 class day: minus 50%. Late 2 class days: minus 100% (zero credit)

Tutoring is available, free of charge. https://valencia.unm.edu/campus-resources/the-learning-center/learning-center.html for hours, https://esurvey.unm.edu/opinio/s?s=131505 to request a form.

Minimum Final Exam Score*: **If the score on the final exam is less than 70%, the student will receive a grade of D or less for the course, regardless of other test or homework scores.*

Grading:

	Maximum possible points	
4 tests, each worth 100 pts	400	
Drop lowest test:	-100	
Homework (not dropped)	100	
Final exam (comprehensive, not dropped)	150	← (***if < 70%, course grade is D or below***)
	550	(max poss course total)

$532 \leq x \leq 550$	A+	(unless a test is missed, or homework score is less than 50%)
$512 \leq x < 532$	A	(unless a test is missed)
$495 \leq x < 512$	A-	
$477 \leq x < 495$	B+	
$457 \leq x < 477$	B	
$440 \leq x < 457$	B-	
$422 \leq x < 440$	C+	
$402 \leq x < 422$	C	
$385 \leq x < 402$	C-	* See note below re C-minus
$330 \leq x < 385$	D	
$x < 330$	F	

* Be aware: a C-minus might Not qualify you for a planned future course(s) or degree ("a C-minus is not a C"). It is your responsibility to know what grades are required for your academic plans.

Course Objectives/Student Learning Outcomes

1. Sketch and interpret graphs of lines and geometric figures in 3-D.

2. Calculate Dot and Cross Vector Products.

3. Match equations and graphs of cylindrical and quadric surfaces.

4. Perform derivative, antiderivative, and integral calculations with vector functions.

5. Solve 2-D projectile motion problems using vector equations.

6. Identify and calculate arc length, unit tangent vectors, and curvature.

7. Identify and calculate the unit normal and unit binormal vectors for a 3-D curved path thru space.

8. Graph functions of two variables.

9. Find limits of multi-variable functions.

10. Find derivatives of multi-variate functions

11. Calculate directional derivatives and the gradient for functions of two and three variables.

12. Estimate the change in a function $z = f(x,y)$ due to small changes in x and y using differentials.

13. Find extrema of two-variable functions using 1^{st} and 2^{nd} derivative tests

14. Find extrema of two-variable functions using the method of LaGrange Multipliers.

15. Find antiderivatives and integrals of functions of two variables in
    a) rectangular and b) polar coordinates.

16. Find antiderivatives and integrals of functions of three variables in
    a) rectangular, b) cylindrical, and c) spherical coordinates.

17. Calculate the Work done by a vector force Field in 3-D space moving along a path using a path integral

18. Explain and calculate circulation and flux in the context of 2-D vector fields.

19. Use Green's Theorem to calculate circulation in a 2-D field.

20. Calculate surface integrals.

21. Use Stoke's Theorem to calculate circulation in a 3-D vector field.

22. Find the Divergence of 2-D and 3-D vector fields.

23. Calculate the Laplacian of a scalar fuction.

CLIFTON MURRAY

EACH DAY'S HMWK DUE NEXT CLASS DAY

TURN IN GROUPED BY DAY

CALC III

4:30 – 6:20P

SPRING 2021

SKETCHES REQUIRED ON HMWK

MON	WED
18 JAN MARTIN LUTHER KING DAY	20 JAN 3-D SPACE 12.1 # 1, 3, 5, 7, 11, 19, 27, 53 INTRO TO VECTORS 12.2 #1, 7, 21, 23, 25, 45, 47
25 JAN (FIN 12.2) DOT PRODUCT $\vec{A} \cdot \vec{B}$ 12.3 # 1, 9, 25, 43 CROSS PRODUCT $\vec{A} \times \vec{B}$ # 2, 3, 5, 6, 11, 23, 25	27 JAN (FIN VECTORS) IDENTIFY & SKETCH CYLINDRIC & QUADRIC SURFACES 12.6 # 1, 3, 5, 7, 9, 11, 13, 17, 21, 25, 27, 31
1 FEB RVW	3 FEB TEST # 1 3-D COORDS VECTORS 3-D SURFACES
8 FEB VECTOR FUNCTIONS, DERIVATIVES, VECTOR DESCRIPTION OF MOTION 13.1 # 5, 7, 9, 11, 15, 19	10 FEB ANTIDERIVS & INTEGRALS OF VECTOR FUNCTIONS. 2-D PROJECTILE MOTION 13.2 # 1, 3, 5, 11, 23, 25, 40
15 FEB THE UNIT TANGENT VECTOR 13.3 # 1, 3, 15 UNIT NORMAL VECTOR; CURVATURE 13.4 # 1, 3, 9	17 FEB ACCELERATION. UNIT BINORMAL VECTOR 13.5 # 1, 3, 9, 17, 19
22 FEB RVW	24 FEB TEST # 2 CALCULUS W/ VECTORS VECTOR DESCRIPT. OF MOTION
1 MAR 14.1 FUNCTIONS OF TWO VBLS # 1, 3a, 14, 37, 49 14.2 LIMITS OF MULTI-VBL FNS # 1, 5, 11, 13, 25, 29, 41, 43	3 MAR DERIVATIVES OF MULT-VBL FNS (PARTIAL DERIVATIVES) 14.3 # 1, 2, 5, 23, 31, 41, 43, 55, 83, 91 CHAIN RULES 14.4 # 1, 9, 25, 47
8 MAR DIRECTIONAL DERIV, GRADIENT 14.5 # 1, 7, 11, 19 DIFFERENTIALS 14.6 # 23, 27, 53 14.7 EXTREMA OF TWO-VBL FUNCTIONS	10 MAR 14.7 EXTREMA, CONT. # 1, 2, 3, 41 FINDING EXTREMA USING LAGRANGE MULTIPLIERS 14.8 # 1
15 MAR SPRING	17 MAR BREAK
22 MAR RVW	24 MAR TEST # 3 MULTI VBL FNS PARTIAL DERIVS EXTREMA OF MV FNS
29 MAR DOUBLE INTEGRALS 15.3 # 1, 5 15.1 # 1, 3, 17 15.2 # 9, 11, 13, 19, 27 BRING GRAPHER NEXT CLASS	31 MAR POLAR COORDS; SS: 15.4 # 9, 11, 27, 29 TRIPLE INTEGRALS: RECTANGULAR COORDS 15.5 # 7, 9, 21, 22a, 23
5 APR (FINISH 15.5) SSS IN CYL COORDS 15.7 # 29, 29, 31, 37, 39 START SPHERICAL COORDS	7 APR SSS IN SPH. COORDS 15.7 # 43, 49, 54a, 55, 56 (ONLY IF TIME: 15.8, THE "JACOBIAN")
12 APR RVW	14 APR TEST # 4 SS & SSS. POLAR, CYL, SPH COORDS.
19 APR CURVED-PATH INTEGRALS 16.1 # 1, 3, 5, 9, 11, 27. VECTOR FIELDS: WORK BY FORCE FIELD ALONG PATH 16.2 # 1, 3, 7, 19	21 APR 2-D FLUX. 2-D CIRCULATION 16.2 # 29a, 55 2-D DIVERGENCE. 2-D CURL. GREEN'S THEOREM. 16.4 # 7, 11, 27
26 APR AREA OF CURVED SURFACE 16.5 # 37, 49 INTEGRALS OVER ↗ 16.6 # 31	28 APR STOKES THEOREM 16.7 # 7, 8 3-D DIVERGENCE, 3-D CURL 16.8 # 1, 2 INSTRUCTOR'S HANDOUT: THE LAPLACIAN (HMWK TBA)
3 MAY RVW FOR FINAL	CINCO DE MAYO RVW FOR FINAL
10 MAY FINAL EXAM 4-6P	12 MAY