MA 242.601 - Spring 2019
Department of Mathematics
North Carolina State University

Course Description: MA242.601 is the Distance Education section of Calculus 3 at NCSU, the third of three semesters in a calculus sequence for engineering and science majors. The course covers differential and integral multivariable calculus. This course is scheduled for **5 days per week**. The day-by-day schedule listed below is based on 4 topics per week spread over the 5 days, based on 65 video lectures by Dr. Larry K. Norris.

Tests: There are 4 scheduled tests during the semester, and there is a 3-day window for each exam. The 3-day window for each test are shown below in the day-by-day schedule. There is a 4-day window for taking the final exam for the course. See the end of the day-by-day schedule below. DE students take their tests through DELTA testing services. Please see the link "**Information about testing**" on the webpage for the class at MA242 Distance Education

(a) ***If you live on or near the NCSU campus*** you will take your tests at the DELTA testing center on the Centennial campus. Testing at the Centennial campus Delta location is by **appointment only**. You will have to schedule all your exams with DELTA.

(b) ***If you live more than 50 miles from NCSU*** then you will need to find a remote proctoring service, approved by DELTA, to proctor your exams. DELTA testing can provide you with a list of approved remote proctoring locations.

WebAssign: WebAssign is a required component of MA242 – all MA242 students must register online with WebAssign and pay the fee **for homework grading** and **the textbook**. WebAssign homework counts 20% of each student's total grade.

Textbook: *Calculus for Engineers and Scientists, Vol III,* by John E. Franke, John R. Griggs, and Larry K. Norris,
1st edition. The text is in pdf format and will be available to students via WebAssign.

Students with disabilities: Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students: https://dro.dasa.ncsu.edu/

MA 242 Day-by-day Schedule Spring, 2019

Week of	Section	Topic
1/07 – 1/11	1.1	Chapter 0: Chapter 1.1: Cartesian Coordinates: In 2 and 3 dimensional space
	1.2	Vectors in 2 and 3 Dimensions:
	1.2	Continue study of vectors
	1.3	The Angle Between Two Vectors: The Dot Product
1/14 – 1/18	1.4	The Cross Product:
		Lines and Planes in 3-dimensional Space
	1.5	More on equations of lines and planes
	2.1	The Calculus of Vector-valued Functions: Limits, derivatives and integrals
1/21	Monday	Holiday
1/22 – 1/25	2.2	Parameterized Curves in Space: Newton's second law. Begin free fall under gravity. Projectile motion under gravity; The isotropic oscillator (Optional)
	2.3	Fundamental Quantities Associated with a Curve: Tangent vectors, arc length and curvature
	2.4	The Intrinsic Geometry of Curves in 3-Space; curvature and the osculating plane
1/28 – 2/1	2.4	More on the geometry of curves in space; the osculating circle, and the normal and tangential components of acceleration
	3.1	Multivariable Functions: Material up through level curves
		Review for Test #1
February 1	Friday	TEST #1 (********** **3-day window: 1/31, 2/1, 2/4** **********)
2/4 – 2/8		Multivariable Functions: Material up through level curves
	3.1	Level surfaces of functions of 3 variables. Parametric surfaces.
	3.2	Limits and Continuity: Theorems on limits; Continuity;
	3.3	Directional Derivatives: Partial derivatives; higher derivatives;
2/11 – 2/15	3.3	Geometrical interpretation of partial derivatives; Tangent plane to the graph of $f(x,y)$
	3.4	Differentiability of multivariable functions: Definition; Differentiability and continuity; Theorem 9 on characterizing differentiability.
	3.5	The Directional Derivative and the Gradient: Formula for the directional derivative in terms of the gradient.
		What does the gradient vector say about a function?
2/18 – 2/22		The Chain rules for multivariable functions
	3.5	Tangent planes to graphs $z = f(x,y)$; The general chain rule
	3.6	Optimization: local and global extreme values of $f(x,y)$
	3.6	More on extreme values;
		Review for Test #2
Monday, 2/25	Monday	TEST #2 (********** **3-day window: 2/22, 2/25, 2/26** **********)
2/26 - 3/1	4.1	Double Integrals over a rectangle as a limit of Riemann sums
		Fubini's Theorem for double integrals over rectangles; iterated integrals
	4.1	Double integrals over general regions
3/4 – 3/8	4.1	Reversing the order of integration
	4.2	Applications of Double Integrals

	4.3	Triple Integrals in Cartesian Coordinates: Over rectangular solid regions
3/11 – 3/15		Spring Break
3/18 – 3/22	4.3	Triple integrals over z-simple regions
		Triple integrals over x & y- simple regions; Applications of triple integrals
	5.1	Double Integrals in Polar Coordinates: over polar rectangles
	5.1	Double integrals in polar coordinates over more general regions
3/25 – 3/29	5.2	Triple integrals in cylindrical coordinates
	5.3	Triple integrals in spherical coordinates
	5.3	More on triple integrals in spherical coordinates
		Review for test #3
4/1	Monday	TEST #3 (********** **3-day window: 3/29, 4/1, 4/2** **********)
4/2 – 4/5	6.1	Vector Fields
	6.2	Line Integrals of functions: First briefly review parameterized curves from section 2.2 and formula #2.6 for ds/dt in section 2.3.
	6.3	Line integrals of vector fields: The fundamental theorem for line integrals
	6.3	Conservative vector fields and potential functions; Conservation of total energy
4/8 – 4/12	6.4	Parametric Surfaces in Space: graphs, spheres and cylinders
		Surface Integrals: Surface Area of a Parametric Surface Tangent planes to parametric surfaces
	6.5	Surface Integral of a Function
	6.5	Surface Integral of a Vector Field
4/15	6.5	More on surface integrals of vector fields
4/16		Review for test #4
4/17	Wednesday	TEST #4 (********** **3-day window: 4/16, 4/17, 4/18** **********)
	7.1 7.2	Integral Curves of Vector Fields The Divergence of a Vector Field
4/19	Friday	Holiday
4/22 – 4/26	7.2	The Curl of a Vector Field:
	7.3	Green's Theorems: for circulation and for flux
	7.4, 7.5	Stokes' Theorem, The Divergence Theorem
Last day of classes		Semester Summary
4/29	Monday	Day 1 of 4-day window for FINAL EXAM
4/30	Tuesday	Day 2 of 4-day window for FINAL EXAM
5/1	Wednesday	Day 3 of 4-day window for FINAL EXAM
5/2	Thursday	DELTA TESTING **NOT AVAILABLE** ON THURSDAY 5/2 for MA242.601
5/3	Friday	Day 4 of 4-day window for FINAL EXAM

Dear MA 242.601 Distance Education Students,

Welcome to Calculus III Distance Education, spring 2019. Please read all points listed below so that you will be prepared for the course. All information about the course is contained on the **official web pages for the class** at the URL:

https://lkn.math.ncsu.edu/MA242/MA242.601/index.html

You should look at ALL the web pages so that you will be aware of what is available to you.

1. ***email is the main form of communication for the class.*** Do not hesitate to write to me by email to ask questions about the class and course content. I will announce office hours soon.

2. The format for the course is 5 video lectures each week (except for holiday and test weeks). On the web page for the class you will find a **week-by-week schedule** for the class based on 4 topics per week spread over 5 lectures each week. On the webpage for the class a link is provided for the web page for the videos from which you should fashion a schedule.

   I encourage you to set a schedule and stick to your schedule for viewing the videos and practicing working homework problems.

   In summary each day you should:

   (a) Look at the week-by-week schedule on the webpage for the class and determine the topic to be covered that day. Then look at the "Video Lectures Topics List" to determine which video you should be viewing.

   (b) Then go to the corresponding video lecture for that topic and watch the video. Take notes, stop and rewind, etc, and work your way through the lecture.

   (c) Work end-of-section practice problems from the textbook. (Test questions are often similar to these questions.)

   (d) Work the WebAssign problems corresponding to the lecture material.

3. The lectures for the class are all in **streaming video format**. However, you may pause, rewind and/or fast forward the videos. The link to the videos is in the lower right-hand corner of the webpage for the class given above.

4. **Grading for the course:**

WebAssign Homework	20 %
4 inclass Tests @ 12.5%	50%
Final Exam	30%

In addition:

In computing your course grade I will replace the lowest of your four inclass tests with your final exam grade, provided the final exam grade is higher than the lowest of your four inclass tests grades.

5. **Plus-minus Grading Scale**

Grading Scale

A+	97-100 %	B+	87-89.9 %	C+	77-79.9 %	D+	67-69.9 %	F	0-59.9 %
A	93-96.9 %	B	83-86.9 %	C	73-76.9 %	D	63-66.9 %		
A-	90-92.9 %	B-	80-82.9 %	C-	70-72.9 %	D-	60-62.9 %		

6. We are using the 1st edition of the new calculus online book *Calculus III for Engineers and Scientists* by J. E. Franke, J.R. Griggs, and L. K. Norris. You will purchase this book when you sign up for WebAssign Homework. Once classes begin you should go to http://webassign.ncsu.edu and sign up for homework grading and the textbook. The fee is $77.95 which includes both homework grading and the textbook. **WebAssign is a required component of the course**. The only *graded homework* is the WebAssign homework.

7. **INFORMATION ABOUT TESTING:** There will be 4 regular tests during the semester, plus a comprehensive final exam. Test dates are listed on the week-by-week schedule mentioned above, and there will be **a 3 day window for taking each test**. The 3-day windows are listed on the week-by-week schedule. You can take these tests in one of two locations:

   (a) **Testing with DELTA Testing services On-Campus:**

   At the DELTA Testing Services offices on the Centennial Campus in Venture IV, Suite 236. **All testing will be by appointment only.** Students will be required to schedule appointments at least one business day in advance at

   http://go.ncsu.edu/takemytest

   (b) **Testing with DELTA Testing services Off-Campus with a remote proctor:**

   At a secure location (University, community college, US Embassy, etc) **using a remote proctor** if you live more than 50 miles from NCSU. If this is your situation then you **MUST have your proctor approved by DELTA Testing Services.**

   You MUST see the remote proctor link at the following URL

   https://lkn.math.ncsu.edu/MA242/MA242.601/TestGuidelines.html

   and **follow the instructions on that page. This is one of the most important things you must do at the start of the semester.**

8. **REMARK about Maple:** During the summer, 2018, the Mathematics Department canceled the part of the curriculum that involves the Maple computer language. There will be no maple component in the course this semester. Consequently you will need to kindly **ignore** the references to Maple in the video lectures.

Best regards,

Dr. Larry K. Norris