Syllabus

Course Identifier	**MATH 201**
Course Title	**Calculus III for Science and Engineering (4 credits)**
Academic Year	**2019 - 2020 (Fall semester)**
Instructor	**Kostas Karagiannis**
	Office: Number 023 – Niarchos Technology Center (Lower Level Bissell Library)
	Office hours: Please refer to the Instructor's schedule at the end of this document
	Email: k.karag@act.edu
Course delivery	Lecture 42 hours
Prerequisites	Successful Completion of Math 121 - Calculus II for Science and Engineering, or College Level Calculus II course, or Placement Test.

Assessment

Assessment Type	Assessment Length/Details	Proportion
In Class **Quizzes**	In class 10-minute quizzes. 4 – 6 quizzes during the semester.	**15 %**
Take-Home **Assignments**	Approximately the end of each chapter an extended problem set – Skill and Application problems	**15 %**
In Class **Exam 01**	Approximately during the 5th teaching week of classes	**20 %**
In Class **Exam 02**	Approximately during the 9th teaching week of classes	**20 %**
In Class **Final Exam**	During the Final Exams week (3 hours)	**30 %**
Examinations dates will be listed in the Tentative Course Schedule (passed out at the beginning of the semester). Their actual dates will be announced in class and/or Moodle at least two periods before they take place		

Brief description

The purpose of this course is to give a solid foundation in Calculus concepts, tools and techniques for the student entering Science and Engineering fields. This course is a continuation to Calculus II for Science and Engineering

This course will address:

- Vectors, the dot and cross products, lines, planes, and surfaces.

- Vector-valued functions, their derivatives and integrals, the length and curvature of space curves, and velocity and acceleration along space curves, culminating in Kepler's laws.

- Functions of two or more variables are studied from verbal, numerical, visual, and algebraic points of view.

- Contour maps and the Midpoint Rule are used to estimate the average snowfall and average temperature in given regions. Double and triple integrals are used to compute probabilities, surface areas, and (in projects) volumes of hyperspheres and volumes of intersections of three cylinders. Cylindrical and spherical coordinates are introduced in the context of evaluating triple integrals.

- Vector fields. The similarities among the Fundamental Theorem for line integrals, Green's Theorem, Stokes' Theorem, and the Divergence Theorem are emphasized.

The course emphasizes on skill, conceptualization and some modelling. All three are of great importance. Visualization and analysis via the use of technology is used in lecture and could be addressed in Take-Home Assignments.

Content

Topics Covered in Course (Chapter – Topic)
12 - Vectors and Geometry of Space
13 - Vector Functions
14 - Partial Derivatives
15 - Multiple Integrals
16 - Vector Calculus

Required Textbook(s):

Stewart, James. *Calculus: Early Transcendentals, International Metric Edition, 8th Edition*. Cengage Learning EMEA, 20150825. VitalBook file.

This eBook is available, upon registration for the course, through a link in our course Moodle site.

Optional Reference Textbook

- **Worldwide Multivariable Calculus David B. Massey** Northeastern University. – ISBN-10: 0-9842071-3-9 ISBN-13: 978-0-9842071-3-8
  PDF and printed versions available at: http://www.centerofmath.org/textbooks/multicalc/index.html

Calculator: A scientific graphing calculator, without CAS capabilities. (Like: Texas Instruments TI-83).

In-Class Handouts: Provided by the instructor

Policies:

Policy 1: There are no make-ups for quizzes & exams.

Policy 2: There is a maximum of **10** hours of absences.

Policy 3: It is each student's responsibility to meet the College's standards of academic Integrity by avoiding involvement in cheating or plagiarism. According to the policy "A student committing an act of Academic Dishonesty in a given course will receive an F (0 percentage points) in the assignment where the academic infraction took place. If a student commits an act of Academic Dishonesty for a second time in the same course, this student will receive a failing grade in that course (see details later on in syllabus)/

Policy 4: No late assignments will be accepted. There are no make-up quizzes. An **exam can be rescheduled only if there is documented medical emergency, funeral or previous arrangements have been made with the instructor**. Weather cancellations of classes are announced in the local mass media. The instructor reserves the right to reschedule a class, schedule an additional class or review session by announcing that in a class session. I can be reached via email (my address is stated at the top of the syllabus).

Additional Resources

- **Course Website in Moodle(MDL):** Assignments, online tests and grades will be posted in this website. You are responsible for what is posted in this website and thus you should login and check it on a regular basis.
  Moodle Login Instruction: From on campus, as well as off campus, you can access Moodle using the URL: moodle.act.edu. Use the same username and password you use to login to the ACT network.

- **MathCAD or MATLAB mathematics software**: Available at the ACT computer labs (do not purchase)

Grading

The following is the breakdown of the letter grade percentages

Grade Description	% points	US Letter Grade	US point grade
Excellent	95-100	A	4.0
Very Good (high)	90-94	A-	3.67
Very Good (low)	85-89	B+	3.33
Good (high)	80-84	B	3.0
Good (low)	75-79	B-	2.67
Satisfactory (high)	70-74	C+	2.33
Satisfactory (low)	65-69	C	2.0
Fail	0-64	F	0

Grade Descriptors: These descriptors outline the typical characteristics of the standard work associated with each grade.

Excellent: Superior performance; a high level of critical analysis and evaluation; incisive and original; exceptionally well researched; high quality presentation; exceptional clarity of ideas; excellent coherence and logic; trivial or very minor errors.

Very Good: Very good performance; a very good level of critical analysis and evaluation; significant originality; well researched; clarity of ideas, thoughtful and effective presentation; very coherent and logical; minor errors only.

Good: A good performance; a good level of critical analysis and evaluation; some evidence of originality; reasonably well researched; ideas generally clear and coherent; some but not significant weakness.

Satisfactory: Satisfactory performance—at least passable; acceptable level of critical analysis and evaluation; little evidence of originality; adequately researched; ideas fairly clear and coherent, though some significant weakness.

Fail: Clearly below the pass standard; lacking substance, knowledge and understanding; ideas confused and incoherent; fundamental weaknesses in most areas; fails to meet the Learning Outcomes.

Absence Policy

Students are expected to attend and participate in all of their courses throughout the term, including the first week. Those who fail to do so may be administratively withdrawn from individual courses of the College. This may affect the students' scholarship and financial aid eligibility.

A student is considered to have successfully attended a course if s/he has attended 75% of the course lectures. Thus, for a typical ACT course with 42 hours of contact time, the maximum number of absences stands at 10 hours per course. This policy applies to all ACT students, degree-seeking and Study Abroad. Please note that absences are counted on an hourly basis. Absences due to participation in school-related trips and activities may count toward this limit.

Class Format

1. Class Activities---200 in class minutes per week for the duration of the semester
   a) Lecture of new material
   b) Discovery method for presenting new material
   c) Discussion of assigned reading and/or problems
   d) Student presentation of problems
2. Individualized Study
   a) Students are expected to read the textbook and work exercises over material covered in class and in the textbook.
   b) The student will be expected to participate in each class period by asking questions and making comments on the material read and the exercises worked on.
3. Individual Student Conferences
   a) Students can receive help from the instructor through scheduled office hours or by appointment.

Advice for Success

You are expected to:

- Attend all classes.
- Complete the reading assignments.
- Ask the instructor to aid you any problems with the material.
- Complete all homework assignments and keep them in a folder which you will bring with you in every class period.
- Complete all in class quizzes and examinations.
- Complete and turn in all class projects on the due date.
- Participate in class.

Last Updated: Fall 2019
by Kostas Karagiannis

Appendix A: Statements & College wide Policies

Statement on Academic Integrity

"The College has the responsibility of maintaining the highest possible standards of academic integrity for the purpose of ensuring the quality of education it provides, underscoring its dedication to fostering a love of learning for its own sake, and of protecting those who rightly practice integrity in their academic affairs. It is the responsibility of the student to be informed about the college's policy on Academic Integrity, to refrain from infractions of that policy and from conduct, which may lead to suspicion of infractions, and to refrain from aiding or encouraging others in such infractions. It is the responsibility of the faculty to establish and maintain an environment which is conducive to Academic Integrity."

Academic Honesty

"Academic Dishonesty is the violation of Academic Integrity, committed by engaging in any form of unethical behavior which violates acceptable standards of scholarly conduct. Such practices as cheating on examinations, submitting borrowed or purchased papers and/or prepared bibliographies as one's own, plagiarizing, falsifying or copying lab reports, or aiding another person in any of the above infractions of Academic Integrity, constitute acts of Academic Dishonesty."

College-wide Policy on Academic Integrity

All academic divisions at ACT, both undergraduate and graduate, will apply the following policy on academic integrity:

"A student committing an act of Academic Dishonesty in a given course will receive an F (0 percentage points) in the assignment where the academic infraction took place. If a student commits an act of Academic Dishonesty for a second time in the same course, this student will receive a failing grade in that course".

The individual faculty is responsible for enforcing the policy in a conscientious manner, for reporting all cases to the Academic Standards & Performance Committee (AS&PC) for record-keeping and for informing the affected students of their right to appeal the faculty's decision to the AS&PC. Faculty must also insert the college's policy on Academic Integrity in their course syllabi."

Academic Standards & Performance Committee

A student may appeal an initial decision made by an individual faculty to a formal body called the Academic Standards & Performance Committee (an existing standing Committee), chaired by the Director of Academic & Student Affairs.

The AS&PC will meet as needed to evaluate appeals on alleged cases of academic dishonesty referred to the Committee by an involved party. Each case referred to the Committee will have a separate hearing (several hearings could conceivably take place during a single session of the Committee). Cases sent before the Committee deemed invalid will be dismissed. The AS&PC will keep records of all academic infraction cases, whether appealed or not and it will reserve the right to invite a student who has breached repetitively the school's policy to a hearing that may lead to sanctions ranging from failure of an assignment, to failure of a course, semester-long dismissal from the college, expulsion from the college.

Appendix B – Course Content

Notes:
Practice problems per section will be posted in Moodle and students are expected to solve <u>all</u> of the practice problems posted there. dd problems have solution at the end of the textbook.

The graded Take-Home Assignments may include some of the above problems and they will be made available to the students in printed form in class and electronically on Moodle.

Take-Home Assignments must be turned in handwritten form and on the handout provided by the instructor at the date assigned on Moodle.

Appendix C: Tentative Day-by-Day Lecture Schedule including assignments and assessments

	Monday	Tuesday	Wednesday	Thursday	Friday
			MT201 - Calculus III		
			Tentative Schedule. Follow Moodle for actual Schedule		
Week 01	23-Sep 12.1 3D Coord	24-Sep	25-Sep 12.2 Vectors	26-Sep 12.3 Dot Product	27-Sep 12.4 Cross Prod.
Week 02	30-Sep HW 01 DUE 12.5-12.6 Lines & Planes	1-Oct	2-Oct QZ 01 12.5-12.6 Cylin. & Quadr. Surf.	3-Oct QZ 01 13.1-13.2 Vector Functions	4-Oct 13.1-13.2 Space Curves
Week 03	7-Oct HW 02 DUE 13.1-13.2 Deriv and Integ of V.Fs	8-Oct	9-Oct 13.3-13.4 Arc Lgth and Curvat.	10-Oct QZ 02 13.3-13.4 Motion In Space	4-Oct... 14.1-14.3 Fncts of Sev. Vars
Week 04	14-Oct HW 03 DUE 14.1-14.3 Partial Derivatives	15-Oct	16-Oct EXAM 01 Review	17-Oct EXAM 01	18-Oct 14.4 Tang Pln and Lin. Appr.
Week 05	21-Oct 14.5 The Chain Rule	22-Oct	23-Oct HW 04 DUE 14.6 Direct. Derivs	24-Oct 14.7-14.8 Max and Min Values	25-Oct FALL BREAK
Week 06	28-Oct FALL BREAK	29-Oct	30-Oct QZ 03 14.8 Lagrange Multipliers	31-Oct ATHENS TRIP	1-Nov ATHENS TRIP
Week 07	4-Nov 15.1 Double Ints over Rctnls	5-Nov	6-Nov 15.2 Dbl Ints over Gen. Reg.	7-Nov ATHENS TRIP	8-Nov ATHENS TRIP
Week 08	11-Nov 15.3 Dbl Ints in Polar	12-Nov	13-Nov HW 05 DUE 15.4-15.5 Mult. Ints. Apps.	14-Nov EXAM 02 Review	15-Nov EXAM 02
Week 09	18-Nov 15.6 Triple Integrals	19-Nov	20-Nov 15.7 Triple Ints in Cyl.	21-Nov 15.8 Triple Ints in Sph.	22-Nov HW 06 DUE 15.9 Chng of Vars Mult. Ints
Week 10	25-Nov 16.1 Vector Fields	26-Nov	27-Nov QZ 04 16.2 Line Integrals	28-Nov 16.3 Fund. Thm of Line Ints	29-Nov 16.4 Green's Theorem
Week 11	2-Dec 16.5 Curl and Divergence	3-Dec	4-Dec HW 07 DUE 16.6 Parametric Surfaces	5-Dec 16.7 Surface Integrals	6-Dec 16.8 Stokes' Theorem
Week 12	9-Dec	10-Dec	11-Dec Final Exams	12-Dec	

		Quiz Day			**MidTerm/Final**
		HomeWork			**No Class**

Appendix D: Tentative Instructor Schedule

FALL 2019 - KARAGIANNIS					
Time Block	Monday	Tuesday	Wednesday	Thursday	Friday
09:00 - 09:30					
09:30 - 10:00					
10:00 - 10:30	Office Hours		Office Hours	Office Hours	Office Hours
10:30 - 11:00	Office Hours		Office Hours	Office Hours	Office Hours
11:00 - 11:30	Office Hours		Office Hours	Office Hours	Office Hours
11:30 - 12:00					
12:00 - 12:30	**MATH 121 K L2**		**MATH 121 K L2**	**MATH 121 K L2**	**MATH 121 K L2**
12:30 - 13:00	**MATH 121 K L2**		**MATH 121 K L2**	**MATH 121 K L2**	**MATH 121 K L2**
13:00 - 13:30	**MATH 201 K L2**		**MATH 201 K L2**	**MATH 201 K L2**	**MATH 201 K L2**
13:30 - 14:00	**MATH 201 K L2**		**MATH 201 K L2**	**MATH 201 K L2**	**MATH 201 K L2**
14:00 - 14:30	**MATH 120 K L2**	Available by Appointment	**MATH 120 K L2**	**MATH 120 K L2**	**MATH 120 K L2**
14:30 - 15:00	**MATH 120 K L2**	Available by Appointment	**MATH 120 K L2**	**MATH 120 K L2**	**MATH 120 K L2**
15:00 - 15:30					
15:30 - 16:00	Office Hours	**STAT 205 A LAB 6**	Office Hours	**STAT 205 A LAB 6**	Office Hours
16:00 - 16:30	Office Hours	**STAT 205 A LAB 6**	Office Hours	**STAT 205 A LAB 6**	Office Hours
16:30 - 17:00	Available by Appointment		Available by Appointment		Available by Appointment
17:00 - 17:30	Available by Appointment		Available by Appointment		Available by Appointment
17:30 - 18:00					
18:00 - 18:30					
18:30 - 19:00					
19:00 - 19:30					
19:30 - 20:00					