Math 122 - Calculus & Analytic Geometry II
Spring 2014 Course Syllabus

James Jones, Professor of Mathematics
Mathematics & Sciences Division – Richland Community College

Meeting Information

Section 01 meets from 10:30 to 11:40 am on Monday, Wednesday, and Friday in room S137.
The WebAssign class key for this course is: **richland 1979 4945**

Instructor Information

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Office Hours

I spend most of my office hours in the classroom, room S137. This allows me to help students with their assignments, homework, projects, exams, and questions.

Monday:	10:10 - 10:30a, 11:40a - 12:00n, 2:10 - 2:30p, 3:40 - 4:50p
Wednesday:	10:10 - 10:30a, 11:40a - 12:00n, 2:10 - 2:30p
Friday:	10:10 - 10:30a, 11:40a - 12:00n, 2:10 - 2:30p

Text

There is a textbook and an electronic homework package required for this course. The electronic package also includes an electronic version of the textbook and you do not have to buy a printed textbook if you want to go completely electronic.

- *Essential Calculus: Early Transcendentals, 2nd edition*. James Stewart. Copyright 2013, Brooks/Cole Cengage Learning. ISBN-13 978-1-133-11228-0 (Required textbook, but printed version is optional)
- *Enhanced WebAssign Homework and eBook LOE Instant Access for Multi Term Math and Science, 1st Edition*. ISBN13: 978-1-285-18421-0 (Required – can also be purchased within WebAssign)

The two items above can be bundled together for cost savings.

- *ePack: Essential Calculus: Early Transcendentals, 2nd + Enhanced WebAssign Homework and eBook LOE Instant Access for Multi Term Math and Science*. ISBN-13: 978-1-285-94067-0 (Required)

Student Audience

Transfer students. Students pursuing degrees in engineering, mathematics, computer science, natural sciences, and life sciences.

Prerequisite

Successful completion (C or better grade) of Math 121, Calculus and Analytic Geometry I.

Course Description

MATH 122 - Calculus & Analytic Geometry II
Hours: 4 lecture - 0 lab - 4 credit
MATH 122 is the second course in the single variable calculus series intended for students going into areas of science, technology, engineering, or mathematics. The course begins with advanced techniques of integration and applications of integration. It then covers infinite sequences and series as well as power and Taylor series. The course finishes with topics from analytic geometry including parametric equations, polar coordinates, and conic sections. Because the order of the topics covered in the calculus series varies by institution, it is recommended that a student needing Calculus 1 and Calculus 2 complete both of them at

the same institution.
Applicable toward graduation where program structure permits.
- Certificate or degree: All certificates and all degrees.
- Group requirement: Mathematics
- Area of Concentration: Mathematics.

Illinois Articulation Initiative (IAI)

The mathematics component of general education focuses on quantitative reasoning to provide a base for developing a quantitatively literate college graduate. Every college graduate should be able to apply simple mathematical methods to the solution of real-world problems. A quantitatively literate college graduate should be able to:
- interpret mathematical models such as formulas, graphs, tables, and schematics, and draw inferences from them;
- represent mathematical information symbolically, visually, numerically, and verbally;
- use arithmetic, algebraic, geometric, and statistical methods to solve problems;
- estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results; and
- recognize the limitations of mathematical and statistical models.

Courses accepted in fulfilling the general education mathematics requirement emphasize the development of the student's capability to do mathematical reasoning and problem solving in settings the college graduate may encounter in the future. General education mathematics courses should not lead simply to an appreciation of the place of mathematics in society, nor should they be merely mechanical or computational in character.

To accomplish this purpose, students should have at least one course at the lower-division level that emphasizes the foundations of quantitative literacy and, preferably, a second course that solidifies and deepens this foundation to enable the student to internalize these habits of thought.

> *Math 122, Calculus & Analytic Geometry II, satisfies the Illinois Articulation Initiative Definition of a General Education Mathematics Course. It corresponds to M1 900-2, College-level Calculus II.*

General Course Objectives

A topical outline of the content covered in the course is given at the end of the syllabus. While learning calculus is certainly one of the goals of this course, it is not the only objective. Upon completion of this course, the student should be able to:
- demonstrate comprehension and understanding in the topics of the course through symbolic, numeric, and graphic methods
- demonstrate the use of proper mathematical notation
- use technology when appropriate and know the limitations of technology
- work with others towards the completion of a common goal
- use deductive reasoning and critical thinking to solve problems
- apply common sense to mathematical problems
- effectively communicate the student's understanding of the subject

Type of Instruction

Discussion, problem solving, student questions, student participation, oral presentations, and lecture. Students are expected to read the material before coming to class and are strongly encouraged to come to class with a list of questions and to ask these questions.

Method of Evaluation

Evaluation could include any of the following: problem solving exams, objective exams, essays, research papers, oral presentations, group projects, individual projects, quizzes, and homework

- 50% of your grade will be based on work conducted in the Enhanced WebAssign online homework and grading system.
- 25% of your grade will be based on in-class, paper and pencil exams.
- 15% of your grade will be based on projects.
- 10% of your grade will be based on quizzes.

WebAssign Personal Study Plan (PSP)

The WebAssign software package has a personal study plan available for this textbook. It consists of practice quizzes, videos, and other tutorials to help you learn the material. In the eyes of the instructor, it is more useful than working a few selected homework problems.

The WebAssign portion (50%) of your grade will be assigned by completing the personal study plan portion practice quiz for each section in the book. These practice quizzes need completed on a regular and timely basis. Waiting until the night before the exam to complete them is not an effective way to learn the material. Furthermore, the instructor is expecting that the students will learn some of the easier material through WebAssign and will focus on the more challenging problems in class.

- If you have completed a practice quiz with a score of 80% of higher before the scheduled start of that section, you will receive a 10% bonus to your practice quiz score for that section.
- If you have completed the practice quiz with a score of 90% of higher before a quiz on that section, you are guaranteed at least 50% credit on the quiz (even if you miss every question). Your score will be whichever is greater: what you scored on the quiz or 50% of the quiz value.
- Practice quizzes that are not completed within 2 class periods of when the section is finished will receive 80% of the score shown.
- All practice quizzes must be completed before the exam on that chapter to receive any credit.
- The score you receive in the gradebook will be the average of the scores on each of the practice quizzes for a chapter.

WebAssign Notes

- Taking the chapter exam in the personal study plan will reset any grades you have received on the individual section practice quizzes. It is not a good idea to take the chapter quizzes before an exam or you will possibly wipe out previous work.
- The practice quizzes will show the latest attempt at the quiz.
- Practice quizzes must be completed and submitted in whole. There is no facility for submitting parts of it. Neither is the ability to retake the quiz and just answer the parts previously missed. For that reason, you are strongly encouraged to take notes and show work on paper (this will greatly speed up the process if you have to repeat the quiz).
- Each item in a practice quiz counts the same, not each question. A four part question counts four times a one part question. This is how WebAssign does it, I cannot change that.
- WebAssign practice quizzes are similar to homework or basic skills. They probably will not help you on the in-class exams, which are more conceptual and like the group activities or technology projects.

Quizzes

The quizzes are mainly designed to encourage reading of the material before the section is covered in class. The questions are picked so that a student with a medium amount of understanding of the section should be able to answer them.

In-Class Exams

The in-class exams in this course do not, as a rule, have basic skills questions on them. There is very little straight-forward "differentiate" or "integrate" type problems. That has been pushed off onto the WebAssign portion of your grade.

What you will find on the in-class exams are fewer problems that get at whether you *understand* the concepts rather than having memorized how to work a particular type of question. The questions will be similar to ones encountered in the group activities or on the technology projects, or they might be items you've never seen before but you should be able to figure out with the information you have seen.

Grading Policy

Letter grades will be assigned to final adjusted scores as follows:

A: 90-100%   B: 80 - 89%   C: 70-79%   D: 60-69%   F: below 60%

Consideration may be given to such qualities as attendance, class participation, attentiveness, attitude in class, and cooperation to produce the maximum learning situation for everyone.

The instructor will give you a grade sheet so that you can record your scores and keep track of your progress in the course. If you are concerned about your grades, see the instructor.

Assignments are due at the beginning of the class period on the date they are due. The instructor may be gracious and allow you to turn them in later that day without counting them late, but do not count on his graciousness. Late assignments lose 20% of their value per class period. The instructor reserves the right to apply this rule to missed exams as well as regular assignments. No late work will be accepted after the final.

Attendance Policy

If you miss the first day of class or any two consecutive days after that without communicating with the instructor, you may be dropped.

Regular attendance is essential for satisfactory completion of this course. Mathematics is a cumulative subject and each day builds on the previous day's material. If you have excessive absences, you cannot develop to your fullest potential in the course.

Students who, because of excessive absences, cannot complete the course successfully, are required to be administratively dropped from the class at midterm. If a student stops attending after midterm, it is the student's responsibility to withdraw to avoid an "F". Do not stop attending and assume that you will be withdrawn from the class by the instructor.

Although dropping students for non-attendance at midterm is required, students whose attendance is occasional or sporadic may be dropped from the class at any point during the semester at the instructor's discretion. The safest way to make sure you're not dropped for non-attendance is to continue to attend classes.

The student is responsible for all assignments, changes in assignments, or other verbal information given in the class, whether in attendance or not.

If a student must miss class, a call to the instructor (RCC's phone system has an answering system) should be made or an email message sent. When a test is going to be missed, the student should contact the instructor ahead of time if at all possible. Under certain circumstances, arrangements can be made to take the test before the scheduled time. If circumstances arise where arrangements cannot be made ahead of time, the instructor should be notified and a brief explanation of why given by either voice or email. This notification must occur before the next class period begins.

Homework

Attempting and completing homework is vital to your success in this course. Homework is the practice that strengthens your skills and prepares you to learn the material. Some students will need lots of practice and some students will only need to hone their skills.

The Enhanced WebAssign package that we are using allows you to try homework online, immediately see if

you have the right answer, get help, and practice a similar problem if you want. Some students like the online version, other students don't work well behind a computer and prefer paper and pencil.

Regardless of how practice problems, it is imperative that you practice. That said, homework will not be part of the grade in this course. Instead, it will help you master the skills needed to learn the material and perform well on the exams.

As calculus students, you are some of the best and brightest mathematics students we have and you have some algebraic and trigonometric skills that most students are lacking. You should voluntarily do as much homework as you need to master the material. In this class, you will be given a list of suggested problems. If you find that you are understanding the concepts, this may be enough for you, but if you find that you still don't understand the material after working those problems, it may be necessary for you to work additional problems.

Technology

The use of technology in this course is consistent with the Technology Statement in the *Illinois Mathematics & Computer Science Articulation Guide* (IMACC, 2008, p. 4). Technology is used to enhance the learning of Calculus, but it is not the focus of the instruction. There will be instances when we will use the calculator or computer to aid in our understanding or remove some of the tediousness of the calculations (especially in the area of numerical approximations). There may be some projects, homework, or portions of a test that require you to use technology to complete.

Here are some of the technology tools that we may use.

WebAssign

WebAssign is an online homework and grading system. Stewart's Calculus text is available in WebAssign as an enhanced electronic version. The full text of the book is there as well as tutorials, videos, and explorations. WebAssign is available at https://webassign.net/

Calculator

This class is a mathematics class and a graphing calculator is required. A scientific calculator is not sufficient. The calculator should be capable of graphing functions, finding roots, maximums, and minimums from a graph, displaying tables of values, and finding the definite integral numerically. A Texas Instruments TI-84 or TI 83 is the recommended calculator. That said, a TI-92, TI-89, or TI Nspire CAS calculator is recommended for this course if you plan on taking additional calculus or engineering courses.

Calculators may be used to do homework and may be used on exams and/or quizzes in class unless otherwise announced.

Maxima

Maxima is an open-source computer algebra system that is free for you to download and use at home. It is available from http://maxima.sourceforge.net/

Microsoft Excel

This spreadsheet application is useful for numerical methods such as the Trapzoid Rule, Simpson's Rule, and Euler's Method. It is loaded on all of the student computers at Richland.

WinPlot

WinPlot is a free graphing software package for Windows written by Rick Parris at Phillips Exeter Academy in NH. The software is useful for creating graphs and it is easy to copy/paste the graphs into other applications. You may download the software by right-clicking your mouse on the word "WinPlot" at the top of the page http://math.exeter.edu/rparris/winplot.html and choosing save.

Google Drive

Google Drive (formerly Google Docs) is a multi-user office suite that has word processing, spreadsheets, drawings, and presentation capabilities. We will use this for collaborating on our technology projects. It works best if you have Gmail account. It is available at https://drive.google.com although it is easily

accessed from your Gmail account.

Additional Supplies
The student should have a pencil, red pen, ruler, graph paper, stapler, and paper punch. The student is expected to bring calculators and supplies as needed to class. The calculator should be brought daily. There will be a paper punch and stapler in the classroom.

Additional Help
The student is encouraged to seek additional help when the material is not comprehended. Mathematics is a cumulative subject; therefore, getting behind is a very difficult situation for the student. There are several places where you can seek additional help in your classes.

You may use a recording device to record the lectures. Feel free to use a camera or cell phone to take pictures of the boards if you have trouble getting all of the information into your notes.

Instructor
I try to make myself as available to the students as I can. My office hours are listed at the beginning of this syllabus, but those are just the times I'm scheduled to be in my office. Grab me and ask me questions if you see me in the hallway. Ask questions before or after class. If I'm in my office and it's not my scheduled office hours, go ahead and stop in.

The instructor should be considered the authoritative source for material related to this class. If a tutor or other student says something that disagrees with the instructor, believe the instructor.

Study Groups
Probably the best thing you can do for outside help is to form a study group with other students in your class. Work with those students and hold them accountable. You will understand things much better if you explain it to someone else and study groups will also keep you focused, involved, and current in the course.

Academic Success Center
The Academic Success Center consolidates several student services into one area. It is located in the south wing of the first floor next to the Kitty Lindsay Learning Resources Center (library).

Testing
The testing center is located in room S116. You must provide a photo identification and know the name of your instructor to use this service.

Tutoring
The tutoring center provides tutoring on a walk-in or appointment basis in room S118. They also have computers with the mathematical software loaded on it.

Quality tutors for the upper level mathematics are difficult to find. Please consider forming a study group among your classmates.

Accommodations
There are accommodations available for students who need extended time on tests, note takers, readers, adaptive computer equipment, braille, enlarged print, accessible seating, sign language interpreters, books on tape, taped classroom lectures, writers, or tutoring. If you need one of these services, then you should see Learning Accommodation Services in room C148. If you request an accommodation, you will be required to provide documentation that you need that accommodation.

Academic Dishonesty
Each student is expected to be honest in his/her class work or in the submission of information to the College. Richland regards dishonesty in classroom and laboratories, on assignments and examinations, and the submission of false and misleading information to the College as a serious offense.

A student who cheats, plagiarizes, or furnishes false, misleading information to the College is subject to

disciplinary action up to and including failure of a class or suspension/expulsion from the College.

Non-Discrimination Policy
Richland Community College policy prohibits discrimination on the basis of race, color, religion, sex, marital or parental status, national origin or ancestry, age, mental or physical disability (except where it is a bonafide occupational qualification), sexual orientation, military status, status as a disabled or Vietnam-era veteran.

Electronic Communication Devices
The Mathematics and Sciences Division prohibits the use of cell phones, pagers, and other non-learning electronic communication equipment within the classroom. All equipment must be turned off to avoid disturbances to the learning environment. If a student uses these devices during an examination, quiz, or any graded activity, the instructor reserves the right to issue no credit for these assignments. The instructor needs to approve any exceptions to this policy.

Topical Outline
The following topical outline is an estimate of how much time will be spent on each topic and is aligned with the chapters in the textbook.

Techniques of Integration – 13 hours
- Integration by Parts
- Trigonometric Integrals and Substitutions
- Partial Fractions
- Integration with Tables and Computer Algebra Systems
- Approximate Integration
- Improper Integrals

Applications of Integration – 15 hours
- Areas between Curves
- Volumes
- Volumes by Cylindrical Shells
- Arc Length
- Area of a Surface of Revolution
- Applications to Physics and Engineering
- Differential Equations

Series – 18 hours
- Sequences
- Series
- The Integral and Comparison Tests
- Other Convergence Tests
- Power Series
- Representing Functions as Power Series
- Taylor and Maclaurin Series
- Applications of Taylor Polynomials

Parametric Equations and Polar Coordinates – 11 hours
- Parametric Curves
- Calculus with Parametric Curves
- Polar Coordinates
- Areas and Lengths in Polar Coordinates
- Conic Sections in Polar Coordinates