

Math 122 - Calculus & Analytic Geometry II

Spring 2021 Course Syllabus

James Jones, Professor of Mathematics

Mathematics, Science, and Business Division – Richland Community College

If you are coming to campus, you must prescreen at <https://www.richland.edu/prescreen>
Updated information regarding Richland's response to COVID-19 can be found on the
College's coronavirus page at <https://www.richland.edu/coronavirus>

Course Meeting Information

The course meets January 14 through May 13. Here are some important dates.

- January 27 is the last day to withdraw and get a refund.
- May 7 is the last day to withdraw from the course without receiving a letter grade.
- The comprehensive final exam may be completed anytime between May 10 and May 13.
- Absolutely no late work will be accepted after May 13.

This is an online course and does not meet face-to-face. The Canvas learning management system will be used. We will be using Edfinity for homework and exams. There is an online student orientation to Canvas and the College that must be completed prior to obtaining access to your courses in Canvas.

Attendance is determined by submission of assignments within Canvas and Edfinity.

Assignments will be due throughout the week and, per federal guidelines, you should expect to dedicate a minimum of 12 hours per week to this course.

Instructor Information

James Jones, Professor of Mathematics

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Web: <https://people.richland.edu/james>

Phone: 217-875-7211, ext 6490

Office: S224

Canvas: <https://richland.instructure.com>

The best way to contact the instructor is through Canvas or by email. Edfinity allows you to email the instructor for homework questions that will take me to the problem you need help with. Responses will come to your Richland student email. Do not leave a voice mail as it will not reach the instructor in time to help.

Office Hours

Office hours will be held by Zoom meeting. Information is provided within Canvas.

Office hours are tentatively scheduled for the times listed below.

- Monday, Wednesday, Friday: 1:00 pm – 1:50 pm
- Tuesday, Thursday: 10:00 pm – 10:50 pm (yes, PM)

Text

There is a textbook and an electronic homework package required for this course.

The textbook is available as a free PDF download and you do not have to buy a printed textbook. The electronic version of the *APEX Calculus Version 4.0* textbook can be downloaded from <http://www.apexcalculus.com/downloads>. There is a multi-volume edition that contains all three semesters of calculus or volumes for the individual courses.

The Edfinity homework system is required. Access to Edfinity is from within Canvas.

- *APEX Calculus 2 (APEX Calculus v4.0) (Volume 2)*. Gregory Hartman. Copyright 2018. ISBN-13: 978-1719263382. Printed textbook is optional.
- *APEX Calculus 3 (APEX Calculus v4.0) (Volume 3)*. Gregory Hartman. Copyright 2018. ISBN-13: 978-1719263665. Printed textbook is optional.
- *Edfinity homework and testing platform*. Required. 5 months access can be purchased in-app for \$25 or through the college bookstore.

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.

This course description also matches Math Majors course description for MTH 902: Calculus II.

M1 900-2 : College-level Calculus II (3-5 semester credits)

Topics include (but are not limited to) the following: limits and continuity; definition of derivative, rate of change, slope; derivatives of polynomial and rational functions; the chain rule; implicit differentiation; approximation by differentials; higher-order derivatives; Rolle's

Theorem and mean value theorem; applications of the derivative; antiderivatives; the definite integral; the fundamental theorem of calculus; **area, volume, other applications of the integral**; the calculus of the trigonometric functions; logarithmic and exponential functions; **techniques of integration, including numerical methods, substitution, integration by parts, trigonometric substitution, and partial fractions**; indeterminate forms and L'Hôpital's rule; **improper integrals**; **sequences and series, convergence tests, Taylor series**; **parametric equations**; **polar coordinates and equations**; vectors in 2 and 3 dimensions, vector operations; lines and planes in space; surfaces, quadric surfaces; functions of more than one variable, partial derivatives; the differential, directional derivatives, gradients; double and triple integrals, evaluation and applications; cylindrical and spherical coordinates.

Prerequisite for Calculus I: College Algebra and Trigonometry with grades of C or better, or Precalculus with a grade of C or better. The panel has compared the IAI GECC M1 900-2 descriptor against the AP Calculus AB and BC exams and determined there is not a match.

When three courses are required to convey the necessary skills in calculus to mathematics majors, it is highly advised that students complete the entire sequence at a single institution. Course content may vary widely among institutions depending on the credits assigned to each course, and completing the sequence at a single institution is the best way to assure that neither credit nor content is lost in transfer.

The IAI description for Calculus involves all three semesters since some schools cover the sequence in a different order. The portion of the Calculus sequence that is covered in Richland's Calculus 2 is **highlighted in red**.

For more information on the Illinois Articulation Initiative, visit their website at <http://www.itransfer.org/>

Topical Outline

A weekly calendar listing the specific material covered each week is provided at the end of this syllabus. This section is provided as a broad overview of the major topics covered.

This course does not run on calendar weeks and any attempt to coerce the calendar into a weekly schedule necessarily introduces some approximation. For example, an exam may be in a different week than the weekly heading suggests or a chapter may begin midweek.

The official calendar that the students receive is a one page, 16 week, daily calendar. This calendar lists the section from the textbook being covered each day and the dates that major assessments are due. Due dates will also be listed in the Canvas learning management system.

- Techniques of Integration – 4.5 weeks
- Applications of Integration – 3 weeks

- Series – 4.5 weeks
- Planar Curves – 3 weeks

General Course Objectives

A topical outline of the content covered in the course follows this section. 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.^{1, 2, 4}
- demonstrate the use of proper mathematical notation.^{1, 2}
- use technology when appropriate and know the limitations of technology.^{1, 2, 3, 4}
- work with others towards the completion of a common goal.^{1, 2, 3, 4}
- use deductive reasoning and critical thinking to solve problems.⁴
- apply common sense to mathematical problems.⁴
- effectively communicate the student's understanding of the subject.^{1, 2}

The numbered superscripts refer to the Richland Cross-Disciplinary Outcomes addressed by that objective.

Richland Cross-Disciplinary Outcomes

Richland Community College has established some outcomes for degree-seeking students. These are not necessarily completed within a single course, but should be demonstrated and assessed at some point before the student graduates. Richland may utilize anonymous student work samples for outcomes assessment and continuous improvement of courses and programs.

Richland Community College's cross-disciplinary outcomes are:

1. The degree-seeking student will communicate effectively in writing.
2. The degree-seeking student will orally communicate effectively.
3. The degree-seeking student will access, evaluate, and appropriately use information in research and applied contexts.
4. The degree-seeking student will think critically and creatively

Program Outcomes

In addition to the cross-disciplinary outcomes, the mathematics program at Richland Community College has established some discipline-specific outcomes and goals.

1. **Mathematical Reasoning:** Students will apply mathematical reasoning to solve story problems. This goal influences the course, but is not measured directly.
2. **Preparatory Skills:** Students will demonstrate mathematical competencies needed for success in other courses. This goal influences the course, but is not measured directly.

Course Expectations

Student Expectations of Instructor

Here are some things you can expect from the instructor.

- The instructor will be present in the course. This is not a correspondence course; the instructor will be checking the course daily. The instructor may occasionally provide guidance in the discussions, but the goal is for the students to run with those.
- Responses to email or Canvas messages will occur in a timely manner, usually within a few hours, but at most by the next day.
- Assignments will be graded within 3 days of submission.
- The instructor will provide guidance and direction on assignments, but will usually steer the student towards the answer rather than just providing the correct answer. Understanding the problem and process is more important than just getting the answer.
- When the instructor makes a mistake, he will admit it and not blame Canvas or other technology for his mistakes. Be aware that the explanation of the mistake may include his frustration with the technology, but he will accept blame if it is really his mistake. If the mistake warrants, adjustments may be made.
- The instructor will treat students with civility and respect. As an online course, there is great potential for misunderstanding. Electronic communication is more difficult than in-person communication and communicating mathematics electronically is even more difficult because of the special symbols, formatting, and language. It is easy to mistake something said and blow it out of proportion. The instructor does not intend to offend anyone, so if you're taking something that way, please accept my apologies ahead of time and then ask for clarification.

Instructor Expectations of Student

Here is what is expected out of students in this course.

- Students will communicate with the instructor. Life-events happen, but the instructor needs to know about them as soon as possible when they are going to interfere with learning. Do not just disappear from the course for a while.
- Students will be civil and respectful of all persons in the course.
- Students will be present in the course on near-daily basis. There may be a few times where you miss a day, but you should be in the course at least four (4) times a week. This is not a course where you can check in every few days or just on the weekend and succeed.
- Students will monitor Canvas and their student emails and respond to the instructor or other classmates in a timely fashion.
- If a student contacts the instructor for help and then figures it out before the instructor has a chance to respond, the student will notify the instructor that the problem has been

resolved or that help in a different area is needed.

- Students will read the book, watch the videos, and read the material in Canvas before contacting the instructor for help. Many of the questions that students have are already answered in the online material and you can find them faster yourself than you can by contacting the instructor and waiting for a response.
- Students will take advantage of any course forums to ask questions that are not personal in nature. This allows other students to benefit from and potentially answer the questions.
- When a student contacts the instructor for help, the student should be prepared to show what has been attempted or already accomplished. The student should be specific in his or her requests. Do not send a request for help that just says, for example, "I don't understand derivatives." While you may be lost, that is a larger request than can be solved by email and it provides no place for the instructor to begin.
- When a student emails the instructor through Edfinity, it does include a link to the problem you have a question about so he can see what you are looking at. The instructor's response will come back to your Richland student email address.
- Students will be academically honest in their work. Among other things, this means that you will complete your own homework and take your own exams. You are welcome to receive help on homework, projects, and discussions, but the exams need to be yours.
- Students will be asked to sign, date, and submit an honor statement before each exam. The honor statement is "I will not give or receive any unauthorized assistance on this exam." The authorized resources are described inside Canvas, but typically allow the textbook, notes, homework, lecture material inside Canvas, and calculator. Unauthorized resources are typically outside resources including other people. Outside resources may be used as long as they are in your notes before you begin the exam.
- Students will seek help if there are technology issues.

Type of Instruction

Instruction may occur through discussion, problem solving, student questions, student participation, quizzing, examples, and lecture.

Method of Evaluation

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

The official gradebook for the class is inside Canvas.

A schedule will be given to the class that is designed to help spread things out and set a pace for you. You may work ahead of the schedule provided to the class and this is encouraged. If you need extra time, you can take it as long as you keep in communication with the instructor.

Reading Quizzes – 10% of grade

The first step in any section should be to learn the material by reading the book and the lecture notes inside Canvas. Students often go straight to the homework and then struggle because they have not looked at the material. If students get problems correct in the homework, they may never look at the material the instructor presents and miss out on important connections, shortcuts, and desired skills.

There is a reading quiz inside Canvas for each section of the textbook. These are due the day we a section is scheduled to be introduced. You should read and take notes on the material before attempting the quizzes.

They are timed and you have 10 minutes to complete each one. You will not have time to look up everything on the quiz if you have not already become familiar with the section.

You may take a quiz up to one week early, but they close at the end of the day they are due and they cannot be made up if missed. The lowest homework score from each unit (exam) will be dropped.

Homework – 20% of grade

Although rushing to complete homework before looking at the material can be bad, homework is an essential part of learning calculus. There is a difference between watching someone do something and doing it yourself and you cannot fully master the material until you have done the work yourself.

There are many resources online that will provide answers and even work to calculus questions. It is tempting to go to the websites and copy down the answers and get 100% of the homework correct. When it comes test time, students look at the homework, see that they had 100% on each section, and think they know the material. They forget that it took them 12 attempts and they found a video on YouTube where someone worked out the exact problem and they just copied the answer down.

Students also think that if they can do every problem of homework, they know all of the material in the section. There are often concepts covered in the material that are not in the homework. Some concepts are too hard to put into homework that can be automatically graded. Your book has also opted to put in a limited number of homework problems rather than a more traditional calculus textbook that may have around 75 problems per section. Some of the important concepts were left out of the homework in the process.

Online homework systems often check just the answer and not the work. They have no idea if you used the right methods or just asked your calculator for the answer. Mathematics is about the journey, not just about arriving at the destination. How you get your answer is arguably more important than getting an answer. That is why work may be required for exams.

As much as doing homework incorrectly can be detrimental to learning the material and success in the course, doing homework is still important. Failure to learn and practice the concepts will show up on the exams.

Homework will be delivered and assessed using the Edfinity system. Edfinity is a front-end to the WeBWork system sponsored by the Mathematical Association of America (MAA) and the National Science Foundation (NSF).

Homework is due the day after we finish the section (see the course calendar for a lecture schedule). If we finish a section on Monday, then the homework for that section is due on Tuesday. This pattern holds regardless of whether the day after is a holiday or not.

Homework will be accepted up to 7 days late, but there will be a 10% reduction in the points.

Each single part question is worth 1 point, each multi-part problem is worth 2 points regardless. Homework is untimed although it will automatically submit on the due date.

Many of the problems allow for hints and practice of similar problems.

You may work ahead of the suggested schedule, but absolutely no late work will be accepted after May 13.

Homework is a formative assessment. It is designed to help you learn the material, but the learning doesn't really occur within Edfinity. Edfinity is the place where you demonstrate your learning. Giving unlimited attempts

Exams – 60% of grade

Exams will focus on the concepts rather than the calculations. In a non-proctored online environment, there are too many ways for a student to come up with the correct answer without knowing the material. The questions will not be a mere repetition of homework problems. They will focus on numeric and graphical interpretations rather than problems that just need a number. Most of the problems will come from a national library of calculus questions that come from different textbook authors so the questions may not look like what you've practiced in the homework. This is another reason why it is important to learn the material, not just the few problems you're asked to do for homework.

There are exams over the chapters and a comprehensive final exam. The final chapter does not have a separate exam but will compose a major component of the comprehensive final exam. The final exam counts as two regular chapter exams.

These exams are timed and delivered through the Edfinity system. You will be required to scan your written work and submit it through Canvas as part of the exam. The written work will be graded and may alter your Edfinity grade on the exam. Failure to submit work or showing insufficient work will result in a lower grade.

Exams are timed and you will have 100 minutes for each of the chapter exams and 150 minutes for the comprehensive final exam. Within 10 minutes of completing the exam, you will need to scan and upload your written work into Canvas.

Exams may be taken up to 7 days after the due date, however there will be a 10% reduction in points for exams taken after the due date.

The comprehensive final exam occurs during a special time allocated for final exams and the period for taking the final is reduced. Absolutely no work will be accepted after May 13.

Exams are summative, high-stakes, assessments. They are designed to determine whether you have learned the material. You will get one attempt to answer each question in Edfinity. Edfinity will show no information about the correctness of your responses.

Other – 10% of grade

This is a catch-all category for everything else that we do in the course. It may include discussions, projects, quizzes, activities, or any other assignments besides reading quizzes, homework, and exams.

The federal government wants to see substantial student-to-student interaction each week in an online course. In this course, it will occur primarily in the form of online discussions held within Canvas.

Discussions will be based on where the course is scheduled to be. If you are substantially ahead of schedule or behind schedule, you will still need to complete the discussions that the class is working on. Otherwise, you would not be interacting with other students.

There will be some projects and other assignments in this category as well.

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%

Final scores will be rounded to the nearest integer, so an 89.5% will be considered an "A".

All grading are subject to audit and revision if mistakes are found.

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 gradebook for the course will be kept inside Canvas. When you look at your grades in Canvas, there may be a + or – after the letter grade (example, B+ or C–). The plus or minus after the letter grade is informational and intended to be used as an encouragement or a warning that you might be able to move up or that you are in danger of slipping down.

However, the final grades in the course will not contain a + or a -, just the letter grade, and an 80.1% is as much of a B as an 88.7% is.

If you are concerned about your grades, see the instructor.

Late Work

The due dates on the homework and exams are structured to pace you through the semester in a way that will allow for successful completion without overloading the student and still allowing for some lee-way in case situations arise. To master the material, students need to spend significant time each week on the material.

The federal government expects that a course will provide at least 3 hours of material per week for every credit hour of the course. For this course, that means that a typical student should expect to spend a minimum of 12 hours per week on the course. Calculus is not a course where you can come in on the weekends or wait until the night before the exam and cram. You need to spread out the learning so that you have time to process it and learn it.

Students look at the due date or the last date that they can work on something and they decide that is the date that they should start working on it, rather than the date they should finish working on it. This behavior is fostered by the To-Do list in Canvas because that's the date it shows up on their calendar.

Having the reading quizzes due at the start of a section gets it on students To-Do list earlier and gives a better chance of successful completion and staying on target. There is no grace period or late work accepted for the reading quizzes.

For homework and exams, late work be accepted for 7 days after the due date. This is to allow for problems learning the material, life situations that arise, or better scheduling with the student's schedule. However, when left unchecked, what this turns into is students running one week behind on everything and just taking the reading quizzes without reading the material because it is due. To discourage this behavior and help keep students focused and on task, there will be a 10% penalty for work done after the due date.

Student-to-student interaction needs to be done with the class as scheduled, even if you are working on something else at the time. Discussions will close on a schedule as well and you may not come back later to participate. If you fail to participate during the scheduled time, you will get a 0 for that discussion.

For other activities and projects, the student should consider the due date as the final date the project can be turned in. If late work is accepted, it may experience the 10% reduction as well.

Absolutely no late work will be accepted after May 13.

Attendance / Engagement Policy

Participation vs Attendance

Online students are subject to the same attendance requirements as a traditional face-to-face course, but since there are no class meetings to attend, it must be redefined to mean active participation in the course.

Student attendance in an online course is defined as *active participation* in that course as described in the course syllabus. Here is that definition:

Active participation may include posting to discussion forums, submitting assignments, and completing quizzes or exams. Logging into the course or viewing content does not satisfy the definition of active participation.

Online Attendance Policy

Regular attendance and participation is essential for satisfactory completion of this course. You need to be actively involved in this course several times a week, if not daily. You need to regularly monitor your Canvas inbox and Richland email for notifications and information.

Students who do not communicate with the instructor and have irregular or infrequent attendance, miss the first day of class, or miss any two consecutive days may be dropped.

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 participating 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 participation in the course 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 actively participate in the course.

The student is responsible for all assignments, changes in assignments, or other information given in the course. Regularly and frequently monitor your communications for updates or changes, but communicate with your classmates to get notes and other information.

Time Requirements

The federal government requires that there is enough material in this course for a typical student to spend a minimum of 12 hours per week working on it.

In [34 CFR 600.2](#), the federal government requires that the amount of student work for a credit hour reasonably approximates not less than one hour of class and two hours of out-of-class

work per week for each semester hour. That is, there are three (3) hours of material per week for each credit hour.

Students taking a four (4) credit hour course should expect to spend a minimum of 12 hours per week on this course. Students taking a five (5) credit hour course should expect to spend a minimum of 15 hours per week on this course.

If you are taking 15 credit hours, then you should expect to spend at least 45 hours a week on course work. That is the equivalent of a full-time job. The government considers that if you are taking 15 credit hours, then being a student is your full-time job.

According to the federal regulations, this target is a minimum, not an average.

Failure of the course to meet these time requirements could result in loss of program integrity, forcing the college to recover federal financial aid, and ultimately loss of accreditation.

At face value, it sounds overwhelming and impossible, but the time includes reading the book, watching videos, working on homework and projects, and participating in discussions.

The point is to manage your time effectively so that you don't feel the course is overwhelming.

Technology

The use of technology in this course is consistent with the Technology Statement in the [Illinois Mathematics & Computer Science Articulation Guide](#) (IMACC, 2016, 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.

Canvas

The Canvas learning management system holds the online presence for this course. It is where you submit assignments, hold discussions, access course material, and view the gradebook.

You will need to complete the student orientation to Canvas before you can gain access to the course.

Edfinity

Edfinity is an online homework and testing platform. You must log into Canvas in order to access Edfinity.

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.

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 Trapezoid Rule, Simpson's Rule, and Euler's Method. It is loaded on all of the student computers at Richland.

Microsoft Office can be installed for free by current students enrolled in credit courses as part of Richland's licensing agreement with Microsoft. To install Office, go to <https://office.com> and login using your Richland email address and password.

WinPlot

WinPlot is a free graphing software package for Windows written by the late Rick Parris at Phillips Exeter Academy in Exeter, New Hampshire. The software is useful for creating graphs and it is easy to copy/paste the graphs into other applications. Exeter Academy maintained the server with the software for about 4 years after Parris' death, but the site is no longer available. To download the software, visit the instructor's Mathematical Software page at <https://people.richland.edu/james/software>

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 access to a pencil, paper, and calculator each day. You may occasionally want a ruler or graph paper.

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.

Due to COVID-19, this information may not be current.
You should contact the center for more information.

Instructor

Because of the COVID-19 shutdown, I will not be available for face-to-face meetings with students. Meetings may be conducted using Zoom. The instructor is available during the scheduled office hours and by request.

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.

Because of COVID-19, these study groups may need to be conducted online.

Mathematics Enrichment Center

The Mathematics Enrichment Center, located in S118, provides free walk-in tutoring for mathematics courses.

Contact tutoring@richland.edu for more information.

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 N114. 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 C148. Students seeking mathematics tutoring should visit the Mathematics Enrichment Center.

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.

Teaching and Learning Center (formerly Online Learning)

The Teaching and Learning Center is the new name for Online Learning, whose name didn't do justice to the help they provided. They provide technical support for students including answering questions about Canvas, myRichland, e-mail, cell phones, tablets, and laptops. They can also help troubleshoot your computer issues and make sure your computer is ready for course work.

They are located in room W143, but the best way to contact them is through the "Help" link in the lower-left corner of Canvas or at

<https://www.richland.edu/academics/online-learning/online-learning-help-desk/>

Open Computer Labs

Students often wish to know where, besides the classroom, they can go to use the software. There are computers located in the Learning Resources Center and in the Academic Success Center that you may use.

Richland Thrive

Richland Thrive is an implementation of an early-alert identification and intervention system powered by the Hobsons' Starfish software. The software is designed to help students achieve academic success, retention, and graduation.

When academic indicators suggest a student may be experiencing difficulties that may negatively impact academic success, the instructor may raise a referral flag that notifies the student of concern through an email to the student's Richland email, requests a Student

Success Coach or Student Success staff member contact the student to discuss and follow-up on the issue, or encourages student to discuss the matter with the instructor.

If you receive an email notification of a referral flag in any of your courses, you are encouraged to contact the instructor as soon as possible to discuss the issue. The purpose of the discussion is to accurately assess its potential impact on your academic success and to plan and put into action steps to be successful in the course. For more information about the Richland Thrive system, contact the Student Success Center at ext. 6267

College & Division Policies

Academic Integrity Policy

All students are expected to maintain academic integrity in their academic work and honesty in all dealings with the College. 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.

The Academic Integrity Policy also governs student misuse of intellectual property.

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.

Responsible Use of Classroom Content

Class discussions, papers, pictures, video, and any other work created for a course are all considered official course content. Work including papers, discussions, quizzes, assignments, etc., must be confined to the classroom (either on-campus or virtual) and should not be shared outside the classroom without the express permission of the person who created it. Students should respect the privacy of person-to-person or person-to-class communication in all forms. Violating others' privacy may result in removal from the course. Significant or repeated violations may result in suspension or expulsion. This standard is pursuant to Board Policy 5.8.1 (Responsible Use of Information Technology) and the Code of Student Conduct

Copyright Notice

The materials used in this course are protected by Copyright law. Faculty lectures, course supplementary materials, articles, quizzes and exams, papers, data, web pages, and artwork are among the properties protected. This is not an exhaustive list. Items may or may not be marked with a Copyright symbol ©. Regardless, the intellectual property used in this course is owned by the creator who is the sole determiner of how the property is used, including but not limited

to copying, distribution, performance, display, or revisions.

Any questions a student may have about the use of course materials can be explained by the instructor or library staff.

Student misuse of intellectual property is subject to the Academic Integrity Policy as explained in the Student Handbook and Section 5.9 of the Board Policy Manual.

Title IX and Sexual Misconduct

Richland Community College is committed to providing a safe learning environment for all students that is free of all forms of discrimination and sexual harassment, including sexual assault, domestic violence, dating violence, and stalking. If you (or someone you know) has experienced or experiences any of these incidents, know that you are not alone.

All Richland Community College faculty members are "responsible employees," which means that if you tell us about a situation involving sexual harassment, sexual assault, dating violence, domestic violence, or stalking, we must share that information with the Title IX Coordinator. Although we have to make that notification, you will control how your case will be handled, including whether or not you wish to pursue a formal complaint. Our goal is to make sure you are aware of the range of options available to you and have access to the resources you need.

If you wish to speak to someone privately, you can contact Growing Strong Sexual Assault Center at 217-428-0770.

More information about Title IX can be found on Richland's website. Richland's Title IX Coordinator is Alex Berry, email: aberry@richland.edu, office: N105, phone: 217-875-7211, ext. 6314.

Electronic Communication Devices Policy

The Mathematics, Science, and Business 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.

Richland Community College Core Values

- Commitment - We are dedicated to meeting the needs of the communities we serve.
- Respect - We recognize the expertise of all members of the College community and encourage individual contributions.
- Excellence - We strive to develop and pursue higher standards.
- Accountability - We assume and demonstrate responsibility for our actions.

- Diversity - We believe that our similarities and differences are opportunities for establishing a common bond and strengthening the College.

Other College Services

There are some additional services that Richland provides to its students. While they may not directly pertain to this class, you may benefit from them.

Learning Feedback System

At the end of each semester, students are invited to provide feedback to their instructors about the course. This includes things that went well and opportunities for improvement. This online feedback is anonymous and the instructor won't see it until grades have been turned in.

The Learning Feedback System (LFS) is primarily intended to provide feedback to the instructor. However, if you have a issues or concerns, you should not wait until the end of the semester to talk to your instructor. Please come to me at any time. The feedback system is available at <https://people.richland.edu/feedback>.

myRichland

myRichland is the student information system portal and is located at <https://my.richland.edu>.

You may use it to find the course schedule, register for classes, check your grades, obtain unofficial transcripts, review financial aid, and other student services.

Library

The Learning Resources Center (LRC) has print and electronic resources available. They offer research assistance and information literacy sessions; they also have individual and group study areas.

Student Success Center

The Student Success Center, in room N117, is designed to be a one-stop shop for most student services. These include advising and registration, career services, counseling services, financial aid, veteran affairs, student records, and the transfer center.

The Student Success Center has coffee and snacks available daily, school supplies such as paper, pens, and highlighters, and personal supplies such as toothpaste, toothbrushes, and cough drops.

A few other student services are located in other rooms of the main building. These include Campus Life, which supports new student orientation, clubs, organizations, and student leadership, and the TRiO program that offers academic and personal support to first-generation, low-income, and students with disabilities.

Office of Student Engagement

The Office of Student Engagement, in room C133, has a Snack Center to provide grab-and-go food for students who were short on cash while on campus or who did not have time to grab a meal before coming to campus. The office also has personal supplies such as condoms and menstrual products available for students.

The Gender Inclusive/Family bathroom and many women's bathrooms are also stocked with complimentary menstrual products.

Food Pantry

In addition to the snacks in the Student Success Center and the Office of Student Engagement, Richland has partnered with The Good Samaritan Inn to create The Pantry at Richland Community College. If you are a student facing food insecurity, please complete the referral form at <https://bit.ly/2ykuGUL> or visit the Student Success Center.

Directory of Student Services

Due to construction on campus that began in Fall 2020, some services may be relocated. Check with faculty or in the Student Success Center for locations.

Because of COVID-19, some offices will see reduced staffing and availability. A list of support services with descriptions, phone numbers, and email addresses is found online at <https://jics.richland.edu/syllabi/mastersyllabus-studentservices.pdf>

The main phone number for Richland Community College is 217-875-7211 or 217-875-7200. This is an automated system available 24 hours a day.

Student Service	Location	Extension
Accommodations	C148	6379
Campus Life	C131	6243
Career Services	N117	6267
Cashier	N117	6227, 6226
Counseling Services	N117	6267
Financial Aid	N117	6271
Library	C152	6303
Mathematics Enrichment Center	S118	6383
Registration and Enrollment	N116	6267
Student Employment	N103	6305
Student Engagement	C131	6243
Student Records	N117	6267
Student Support Services/TRiO Program	C143	6440
Teaching and Learning Center	W143	6376
Testing	N114	6238
Transfer Center	N117	6438
Tutoring	C148	6379
Veterans' Affairs	N117	6205

Weekly Calendar

This course is organized by unit and day rather than by week. Content scheduled and due throughout the week and the title for the week may not reflect the only content covered that week. This chart is provided as a convenience for students who organize their life by calendar week.

Students will receive a separate daily calendar that contains the section numbers covered each day as well as the due dates for major activities. Due dates are also listed in Canvas.

Week 0, January 14–17..... Techniques of Integration

- Substitution: integration by substitution; trigonometric functions

Week 1, January 18–24..... Techniques of Integration

- Substitution: inverse trigonometric functions; definite integrals
- Integration by Parts: integration by parts, LIATE rule

Week 2, January 25–31..... Techniques of Integration

- Integration by Parts: substitution before integration; tabular method; reduction formulas

- Trigonometric Integrals: powers of sines and cosines; product to sum formulas; powers of secants and tangents
- Trigonometric Substitution: three patterns

Week 3, February 1–7 Techniques of Integration

- Trigonometric Substitution: definite integrals
- Partial Fraction Decomposition: polynomial division; linear factors; irreducible quadratic factors; repeated roots; undetermined coefficients; cover-up method

Week 4, February 8–14 Techniques of Integration

- Hyperbolic Functions: definitions in terms of e ; graphs, properties; derivatives; integrals; inverse hyperbolic trig functions: logarithm equivalents, derivatives, integrals
- L'Hôpital's Rule: indeterminate forms; dominance of functions
- Improper Integration: definition; infinite bounds; infinite range; convergence; p -test; direct comparison test; p -test; direct comparison test; limit comparison test

Week 5, February 15–21 Applications of Integration

- *Exam 6: Techniques of Antidifferentiation*
- Area Between Curves: area between curves; type 1 region, type 2 region; numerical approximations
- Volume by Cross-Sectional Area; Disk and Washer Methods: cross-sectional areas

Week 6, February 22–28 Applications of Integration

- Volume by Cross-Sectional Area; Disk and Washer Methods: disk method; washer method
- The Shell Method: cylindrical shells; summary of methods for finding volume
- Arc Length and Surface Area: length of a curve; surface area of revolution

Week 7, March 1–7 Applications of Integration

- Work: work; Hooke's law; pumping fluids
- Fluid Forces: fluid pressure; fluid force on horizontal surface; fluid force on vertical surface

Week 8, March 8–14 Sequences and Series

- *Exam 7: Applications of Integration*
- Sequences: factorials; sequence; limits; convergence; bounded and unbounded; monotonic sequences; properties of sequences
- Infinite Series: partial sums; convergence and divergence

Week 9, March 22–28 Sequences and Series

- Infinite Series: geometric series; p -series; harmonic series; alternating harmonic series; divergence test; properties of series
- Integral and Comparison Tests: integral test; direct comparison test; limit comparison test

- Ratio and Root Tests: ratio test; root test

Week 10, March 29–April 4 Sequences and Series

- Alternating Series and Absolute Convergence: alternating series; alternating series test; alternating series approximation; absolute and conditional convergence
- Power Series: power series; convergence of power series; radius and interval of convergence

Week 11, April 5–11 Sequences and Series

- Power Series: derivatives and integrals of power series; power series solutions to differential equations
- Taylor Series: Taylor and Maclaurin series; key Taylor series equivalents; binomial expansion; algebra of power series

Week 12, April 12–18 Sequences and Series

- Taylor Series: Taylor and Maclaurin series
- *Exam 8: Sequences and Series*

Week 13, April 19–25 Curves in the Plane

- Conic Sections: conics in rectangular coordinates; parabolas; ellipses; hyperbolas
- Parametric Equations: parametric curves; converting with rectangular

Week 14, April 26–May 2 Curves in the Plane

- Parametric Equations: intersection of curves; parametric form for conics; smooth curves
- Calculus and Parametric Equations: first and second derivatives; tangent and normal lines; arclength; surface area of revolution
- Introduction to Polar Coordinates: polar coordinates; conversion with rectangular

Week 15, May 3–9 Curves in the Plane

- Introduction to Polar Coordinates: polar graphs
- Calculus and Polar Functions: first and second derivatives; tangent and normal lines; area; arclength; surface area of revolution
- Conic Sections in Polar Coordinates: polar conics; eccentricity

Finals Week, May 10–14 Final Exams

- *Comprehensive Final Exam*