

# Math 221 – Calculus & Analytic Geometry 3

## Fall 2020 Course Syllabus

James Jones, Professor of Mathematics

Mathematics, Science, and Business Division – Richland Community College

Because of COVID-19 restrictions, if you are coming to campus, you must prescreen and be approved 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 runs from August 17 through December 11, 2020. Final Exams will be the week of December 7.

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 you should expect to dedicate a minimum of 12 hours per week to this course.

### Instructor Information

James Jones, Professor of Mathematics

Phone: 217-875-7211, ext 6490

Email: [james@richland.edu](mailto:james@richland.edu)

Office: S224

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

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

The best way to contact the instructor is through Canvas or by email. Do not leave a voice mail as it will not reach the instructor in time to help.

Questions that can benefit or be answered by your classmates should be posted in Piazza.

### Office Hours

Office hours will be held by Zoom meeting.

Office hours are tentatively scheduled for the times listed below. This is very much open to change depending on student and teacher availability. Additional information will be provided inside Canvas about office hours.

- 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. You must log into Canvas and access Edfinity from there.

- *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, life sciences.

## Prerequisite

Successful completion (C or better grade) of Math 122, Calculus and Analytic Geometry II.

## Course Description

### **MATH 221 - Calculus and Analytic Geometry 3**

Hours: 4 lecture - 0 lab - 4 credit

MATH 221 is a standard multivariable calculus course intended for students going into areas of science, technology, engineering, or mathematics. Topics covered include three-dimensional space, vectors and their operations, vector-valued functions, arc length, and curvature; partial derivatives with applications, tangent planes, directional derivatives, gradients, and optimization problems; multiple integrals with applications in rectangular, polar, cylindrical, and spherical coordinates systems. The course concludes with vector calculus, line integrals, parametric surfaces, and their applications.

Applicable toward graduation where program structure permits.

- Certificate or degree: All certificates and all degrees.
- Group requirement: Mathematics
- Area of Concentration: Not applicable.

## 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 221, Calculus & Analytic Geometry 3, satisfies the Illinois Articulation Initiative Definition of a General Education Mathematics Course. It corresponds to M1900-3, College-level Calculus III. This course description also matches Math Majors course description for MTH 901: Calculus III.

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 3 is *highlighted in red italics*.

### **M1 900-3: College-level Calculus III**

### **MTH 903: Calculus III**

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 differentials; approximation by differentials; higher order derivatives; Rolle's Theorem: mean value theorem; applications of the derivative; anti-derivative; 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; indeterminate forms: L'Hôpital's rule; improper integrals; sequences and series, convergence tests, Taylor series; *functions of more than one*

*variable, partial derivatives; the differential, directional derivatives, gradients; double and triple integrals: evaluation and applications.* Prerequisite for Calculus III: Calculus II or equivalent of C or better.

*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.*

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.

- Vectors – 3 weeks
- Vector Valued Functions– 3 weeks
- Functions of Several Variables – 3 weeks
- Multiple Integration – 4 weeks
- Vector Analysis – 3 weeks

## General Course Objectives

A topical outline of the content covered in the course follows this section.

### Specific Course Objectives

Upon completion of this course, the student should be able to

- convert between rectangular, spherical, and cylindrical coordinate systems
- find dot products, cross products, and projections using vectors
- form and work with parametric equations of lines
- distinguish the forms of the quadric surfaces
- differentiate and integrate vector valued functions

- find the arc length of a vector valued function
- find the unit tangent, normal, and binormal vectors
- determine the limits of a multi-variable function
- find partial derivatives
- use the chain rule for derivatives with multi-variable functions
- determine directional derivatives and apply the gradient
- find the maximum and minimum of a multi-variable function, identify saddle values
- use the method of Lagrange multipliers to determine the extrema of a multi-variable function
- set up the regions and integrate double integrals in rectangular and polar coordinates
- set up and evaluate triple integrals in rectangular, cylindrical, and spherical coordinates
- use the Jacobian to change variables to ease integration
- find the divergence and curl
- evaluate line integrals
- determine whether a vector field is conservative and use Green's theorem
- find surface integrals
- apply Stoke's theorem

## General Objectives

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.<sup>1, 2, 4</sup>
- demonstrate the use of proper mathematical notation.<sup>1, 2</sup>
- use technology when appropriate and know the limitations of technology.<sup>1, 2, 3, 4</sup>
- work with others towards the completion of a common goal.<sup>1, 2, 3, 4</sup>
- use deductive reasoning and critical thinking to solve problems.<sup>4</sup>
- apply common sense to mathematical problems.<sup>4</sup>
- effectively communicate the student's understanding of the subject.<sup>1, 2</sup>

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 use Piazza to ask non-private messages. 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.
- 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.

We will be using a mastery-based approach this semester. You cannot move on if you have not mastered the material. You will not pass the class until you pass the final exam. The way the class is setup, if you complete all of the homework and exams with the minimum scores, you will pass the class. To get a C in the course, you will need to do more than the minimum.

Homework and Exams can be repeated until mastery is achieved. If you fall behind so much that you are not making progress in the last chapter by the time finals arrive, then you will not pass the class and should consider dropping.

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.

## Homework – 30% of grade

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).

Each single part question is worth 1 point, each multi-part problem is worth 2 points regardless of how many parts are in the question.

You must achieve a minimum of 80% on each homework assignment in a chapter before you can take the exam for the chapter. If you do not achieve the 80% on an assignment, you may move on to another section in the same chapter. That is, if section 4 is a stumbling block, you can start working on section 5 while you figure out section 4.

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 schedule provided.

One temptation with online homework is to shortcut the process by using technology or



websites to get the correct answer without understanding the material. This does not lead to mastery and it will show up on the timed exams where you have to show work.

## **Exams – 60% of grade**

Timed exams will be delivered and assessed using 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.

You must score a minimum of 70% of an exam before you can move on to the next chapter's homework. If you score less than 70% on an exam, then you must submit evidence of improvement before you can retake the exam. This is because repeating an exam without additional studying will lead to similar or worse results.

Once you score at least 70% on an exam, that is your score for the exam and you move on. You may not retake an exam where you scored at least 70%. To pass the class, you must score at least 70% on the final exam.

Edfinity is the delivery method for the exam, but the real grading happens with your scanned written work. Failure to submit work or showing insufficient work will result in a grade below 70% and require a retest.

You must score at least 80% on each homework assignment in the chapter before you can take the exam for the chapter. If you effectively use the homework to learn the material, then scoring 70% on an exam should not be a problem. Shortcutting the homework process by getting answers without understanding will cause you to struggle on the exams.

## **Discussions, Projects, other Assignments – 10% of grade**

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 although there may be some other ways to demonstrate interaction.

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.

We may be able to demonstrate interaction through Piazza. Piazza is an online discussion tool that students should use to ask questions and then other students can go in and provide answers to each other. Piazza is designed like a wiki where the single best answer comes is kept, so it will depend on the reporting capabilities of Piazza as to whether this can be used to demonstrate student-to-student interaction.

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 homework and exams in the course is designed so that you cannot move on until you have mastered the material. There is no penalty for falling behind.

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.

## 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

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, 2019, p. 2). 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. 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.

### Piazza

Piazza is an online discussion forum. We will use it for non-private asking and answering of questions about the course. By asking the questions in Piazza, other students can benefit from the question and even help answer it for other students.

Private communications should happen via email or Canvas messages.

### 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.

You may use a graphing calculator from another company like Casio, but you will be responsible for figuring out how to use it.

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

## Microsoft Excel

This spreadsheet application is useful for numerical methods such as Newton's Method, the Trapezoid Rule, Simpson's Rule, and Euler's Method.

Microsoft Excel is part of Microsoft Office, which is loaded on all of the student computers at Richland.

Current Richland students can obtain Microsoft Office without additional charge as part of the Microsoft Student Advantage program. Log in to <https://office.com> using your Richland email and password and choose Install Office.

## Maxima

Maxima is an open-source computer algebra system that is free for you to download and use at home. It is available for Windows, Mac, Linux, and Android at <http://maxima.sourceforge.net/>

## 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>

## DPGraph

DPGraph is a 3D graphing package, written by David Parker, that will be useful for visualizing the graphs of multi-variable functions. The software is not free, but Richland has a site license that allows students to download and use it without additional charge. You may download it from <http://www.dpgraph.com/graphing-users.html> (be sure to find the entry for Richland Community College)

## CalcPlot3D

This is an online 3D graphing calculator Java applet written by Paul Seeburger at Monroe Community College in Rochester, NY. It allows you to visualize vectors, space curves, surfaces, normal lines, tangent planes, and contour plots. It is available online at <https://www.monroecc.edu/faculty/paulseeburger/calcnf/CalcPlot3D>

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

## **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, but the instructor's internet connection may be insufficient with the children staying home and doing remote learning.

The preferred method of contact is using Piazza for public questions and through Canvas or email with private questions.

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.

During the COVID-19 pandemic, the tutoring is available using the "Richland Tutoring" from the course navigation menu inside the Canvas 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 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.

## **Online Learning**

Despite the title, Online Learning provides help with much more than just your online courses. 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**

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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](mailto: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 beginning in Fall 2020, some services may be relocated. Check with faculty or in the Student Success Center for locations.

Also note that because of COVID-19, some offices will see reduced staffing. 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
Online Learning Support	W143	6376
Registration and Enrollment	N116	6267
Student Employment	N103	6305
Student Engagement	C131	6243
Student Records	N117	6267
Student Support Services/TRiO Program	C143	6440
Testing	N114	6238
Transfer Center	N117	6438
Tutoring	C148	6379
Veterans' Affairs	N117	6205

## Weekly Calendar

This course does not run on a calendar week basis. 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 1, August 17–23 ..... Vectors**

- Introduction to Cartesian Coordinates in Space
- An Introduction to Vectors

### **Week 2, August 24–30 ..... Vectors**

- An Introduction to Vectors
- The Dot Product
- The Cross Product

- Week 3, August 31–September 6 . . . . . Vectors**
- Lines
  - Planes
  - *Exam 10: Vectors*
- Week 4, September 7–13 . . . . . Vector Valued Functions**
- Vector-Valued Functions
  - Calculus and Vector-Valued Functions
- Week 5, September 14–20 . . . . . Vector Valued Functions**
- Calculus and Vector-Valued Functions
  - The Calculus of Motion
  - Unit Tangent and Normal Vectors
- Week 6, September 21–27 . . . . . Vector Valued Functions**
- The Arc Length Parameter and Curvature
  - *Exam 11: Vector Valued Functions*
  - Introduction to Multivariable Functions
- Week 7, September 28–October 4 . . . . . Functions of Several Variables**
- Limits and Continuity of Multivariable Functions
  - Partial Derivatives
  - Differentiability and the Total Differential
- Week 8, October 5–11 . . . . . Functions of Several Variables**
- The Multivariable Chain Rule
  - Directional Derivatives
- Week 9, October 12–18 . . . . . Functions of Several Variables**
- Tangent Lines, Normal Lines, and Tangent Planes
  - Extreme Values
  - Lagrange Multipliers
- Week 10, October 19–25 . . . . . Multiple Integration**
- *Exam 12: Functions of Several Variables*
  - Iterated Integrals and Area
  - Double Integration and Volume
- Week 11, October 26–November 1 . . . . . Multiple Integration**
- Double Integration with Polar Coordinates
  - Center of Mass

- Surface Area

**Week 12, November 2–8 ..... Multiple Integration**

- Volume Between Surfaces and Triple Integration
- Triple Integration with Cylindrical and Spherical Coordinates

**Week 13, November 9–15 ..... Multiple Integration**

- Change of Variables
- *Exam 13: Multiple Integration*

**Week 14, November 16–22 ..... Vector Analysis**

- Introduction to Line Integrals
- Vector Fields

**Week 15, November 23–29 ..... Vector Analysis**

- Line Integrals over Vector Fields
- Flow, Flux, Green's Theorem and the Divergence Theorem

**Week 16, November 30–December 6 ..... Vector Analysis**

- Parametrized Surfaces and Surface Area
- Surface Integrals
- The Divergence Theorem and Stokes' Theorem

**Week 17, December 7–11 ..... Final Exams**

- *Comprehensive Final Exam*