

**Math 152 & 153 Syllabus—Fall 2017**  
**Accelerated Calculus II & Sequences and Series**  
**Professor Inga Johnson**

---

**Class Meetings:**

MWF 9:10-10:10 in Ford 204 (Section 03)

MWF 10:20-11:20 in Ford 204 (Section 04)

**Office Hours:**

Monday 3-4:00pm

Tues, Wed, Fri 1:30-2:30pm

additional office hours by appointment

**Textbook: Single Variable Essential Calculus Early Transcendentals, 2nd Edition by James Stewart. (ISBN-13: 978-1-133-11278-5)**

**Webwork homework site: <https://secure.willamette.edu/webwork2/Math152-Johnson/>**

**WISE syllabus, schedule and grading site: link to be placed here**

**Course Goals, Learning Objectives, and Logistics.**

Upon successful completion of Math 152 students will be able to:

- Justify and explain their steps in problem solving. In particular, students should be able to construct correct a detailed mathematical argument to justify their solution to a problem.
- Describe a definite integral as: the limit of a Riemann sum, the area under a curve, the distance traveled by a moving object, and a total accumulation.
- State, explain, and apply the Fundamental Theorem of Calculus.
- Recognize and implement appropriate integration techniques.
- Set up and evaluate definite integrals to solve problems relating to area, volume, work, and other applications.
- Create and use models using parametric and polar equations.
- Construct integrals that calculate area in parametric and polar coordinates.

Upon successful completion of Math 153 the student should be able to:

- Justify and explain their steps in problem solving. In particular, students should be able to construct correct and detailed mathematical arguments to justify their claimed solutions to problems.
- Describe the meaning of convergence and divergence with regards to sequences and series.
- Explain the validity of several series tests.
- Use an organized approach and justification to determine the convergence of a given series.
- Create a power series representation, such as Taylor series, for a given function and determine its interval of convergence.
- Apply Taylor's Remainder Theorem to find the maximum error possible in using a Taylor polynomial to approximate a function on a given interval.
- Create a Fourier series representation for a given function.

**Is this the right calculus course for me?** This course starts with Integral Calculus (often called Calculus II) with the assumption that you have previously studied the calculus concepts of derivatives, limits and their applications. At the start of Math 152 I expect students to have some fluency with the following concepts (*italicized topics will be reviewed in class*).

- **Limits:** Evaluate the limit of a function using algebra, using a table of values, or using a graph. Evaluate one-sided limits and limits to infinity. Apply *L'Hopitals Rule*.
- **Derivative Calculations:** Calculate the derivative of a function using the definition of the derivative, find the equation of the line tangent to a function at a specified point, calculate derivatives using the sum rule, power rule, product rule, *chain rule*, *calculate the derivative of exponential, log, and trig functions*.
- **Derivative Concepts:** Use the shape of the derivative  $f'(x)$  to sketch the function  $f(x)$ , determine where a function is increasing/decreasing, concave up/down, find local and global maximum values of a function. Interpret and use the derivative as a rate of change. Given units for  $f(x)$ , identify the units for  $f'(x)$ . *Understand the statement of the Mean Value Theorem*.

If you feel uncertain about one or two of these topics, then please come to my office hours during the first two weeks of class and ask me about it. I am here to help you succeed! If three or more of these topics are unfamiliar to you, then please come speak with me as soon as possible to determine whether Math 152 is the right calculus course for you. If you have more questions about which Calculus course is right for you, here is a link to additional [calculus placement information](#).

### **Course Components and Grades.**

- **Homework, Webwork:** Most of the homework for this course will be WeBWorK homework. WeBWorK is an online homework distribution and grading system. One nice feature of WeBWorK is that when you enter an answer to a homework problem, the system immediately tells you whether the answer is correct. On top of that, you can try a problem again, as many times as you like. Once you get it right, that fact is immediately recorded (provided it is before the due date), and any wrong answers are not counted in your grade.

Here is the link to the WeBWork page for [Math 152](#).

If you add the course late you need to email me as soon as possible so that you can be added to the WeBWork system. There will be two WeBWorK assignments per week, one due Sunday night and another due Wednesday night. Each assignment will be due at 11pm.

Here are some tips on using WeBWork:

- Get started early on WeBWorK, and enter some of your answers well before the due date. That way, you will have time to seek help on the harder problems (and the ones that looked easy at first but turned out to be trickier) before the set is due. Avoid the last-minute rush. The system often becomes overloaded and slow in the last couple hours before a set is due, since everyone is trying to enter their answers at the same time.
- WeBWorK usually requires very precise answers. For instance, if the correct answer is 1.60045 and you enter 1.6, the system will say that's incorrect. So if you're entering a decimal answer, give at least five digits of accuracy. On most problems, you can enter answers like  $\cos(9.81\sqrt{(340)})$  instead of a messy decimal, and WeBWorK will do the calculation for you.

- Some WeBWorK problems require formulaic answers, like  $x^{2/3}$ , which means  $x$  raised to the power of  $2/3$  (two-thirds). However, if you enter  $x^2/3$ , the system will say that's wrong, since WeBWorK interprets that as one third of  $x$  squared. So Be careful, and check your syntax. (WeBWorK Set 0, which is recommended but not counted in your grade, will help you learn about entering formulaic answers.)
  - WeBWorK has a previewing feature which allows you to see how a complicated formula you just entered is actually interpreted by WeBWorK. The previewer should help you track down syntax errors as well as ensure that your answer is being interpreted the way you want without having to add three hundred parentheses.
  - Last, and MOST IMPORTANT, do not spend large amounts of time guessing random answers and entering them into WeBWork. This is a waste of your time! If you don't know how to do a problem, please come to office hours or tutoring lab. If you think you are doing everything correctly and WeBWork doesn't accept your answer please come to my office hours, or email me with an explanation of what you have done, so I can help. Banging your head against the computer, yelling at it, or throwing the computer out the window does not change whether or not WeBWork accepts your solution.
- **Homework, Worksheets:** Worksheets will be assigned most Fridays and due on the next Friday. They will include several challenging problems worth a total of 15-30 points. Your worksheets will be graded on the correctness of your solution AND on the organization and presentation of your solution. Your solutions on the worksheet problems must be neatly organized on your paper and carefully written using correct mathematical grammar. Your conclusions must be justified using complete sentences with punctuation.
  - **Midterm Exam and Final Exam:** There will be one in-class midterm exam and a final exam. These exams will be taken individually to test your mastery of the techniques and concepts covered thus far in the course. The final will be comprehensive. The dates and times of midterm and final exams are posted on the course schedule. Students are expected to be present for all exams. Exams will not be given at alternate times unless there is an emergency and you contact me to receive permission prior to the date of the scheduled exam. If you are sick on the day of an exam, please email me or notify me prior to the beginning of the exam.
  - **Course Grades:** Your course work will contribute to your course grade according to the following weights.
    - 35% Homework (Webwork & Worksheets)
    - 30% Midterm Exam
    - 35% Final Exam
 Course grades will be assigned using the following scale. A 93-100%, A- 90-92%, B+ 87-89%, B 83-86%, B- 80-82%, C+ 77-79%, C 73-76%, C- 70-72%, D+ 67-69%, D 63-66%, D- 60-62%, F 0-59%

### Class Preparation, Participation, Norms and Getting Help.

- In a half semester course, missing one class period is equivalent to missing 5% of the course. Attendance will not be taken, but it is highly recommended that you attend every class period.
- To prepare for class each day, carefully outline the section(s) of the textbook that will be covered that day and pay special attention to understanding definitions and statements of theorems.

Look for potential questions to ask during class by determining which parts of the section seem most difficult or confusing. After class, reread the text with more attention to detail. Rework the examples presented in class on your own and then compare your work to the solutions found in class.

- Take good notes during class and review your notes on a regular basis. Begin work on assignments as soon as possible.
- It is inappropriate to ask how to do a problem in class on the day it is due. Please seek help during office hours or via email well before the due date. Emails sent after 5PM the night an assignment is due have only a small chance of being answered before class the next day.
- Students who do not understand a concept from class should (1) ask questions in class. (It is likely that other students have a similar question!) (2) seek individual help. I am happy to go over another example with you. Come to my office hours or make an appointment to see me at another time. (3) Seek extra help at the Math tutoring lab. This is a free tutoring lab staffed by knowledgeable math majors in the Ford Hall Math Hearth on Sunday-Thursday evenings starting in the second week of the semester.
- Studies show that the best thing YOU CAN do to help yourself SUCCEED in Calculus is to create or join a study group. Working through problems with other students, talking through complicated concepts, explaining what you know and listening to the explanations of your peers is an EXCELLENT way to ensure your success in this class.

**Course Workload:** Willamette's Credit Hour Policy holds that for every hour of class time there is an expectation of 2-3 hours work outside of class. Thus, for a class meeting three days a week you should anticipate spending 6-9 hours outside of class engaged in course-related activities. Examples include study time, reading and homework assignments, and group work.

**Special Note:** If you have a documented disability and anticipate needing accommodations in this course, please make arrangements to meet with me within the first two weeks of the semester. If your disability allows for you to have extra time on exams, you must make arrangements with me three days before the scheduled exam date. Please request that a Accessible Education Services staff member send me the appropriate forms specifying the accommodation you will need.

**Academic Honesty:** I am proud to teach at an institution where the students have developed an [Honor Code](#). It is my expectation that you have read the Honor Code and will abide by this code out of respect for your fellow classmates and for our Willamette community.

The following definitions are directly from the CLA Plagiarism and Cheating Policy: Plagiarism is a form of cheating and consists of intentionally or unintentionally representing someone else's work as one's own. Cheating is any form of intellectual dishonesty or misrepresentation of one's knowledge.

You are encouraged to work with your classmates in Math 152 & 153 to figure out solutions and understand concepts together. However, your write-up of your solution must be your own work. If you work with other students in class you must cite their names on the top of your worksheet.

"Plagiarism and cheating are offenses against the integrity of the courses in which they occur and against the college community as a whole. Plagiarism and cheating involve intellectual dishonesty, deception and fraud, which inhibit the honest exchange of ideas." For additional information about the Willamette University academic honesty policy please refer to the [CLA Plagiarism and Cheating website](#).

## Advice from previous Math 152/153 students to current Math 152/153 students.

regarding Webwork...

- “Dont blow off the Webwork. As much as everyone will complain about it, it is one of the most helpful tools to practice what you saw in lecture (and they are easy points towards your grade!).”
- “Do the Webwork! It is a large component of your grade!”
- “The Webwork can sometimes be easy to cheat and just guess, but eventually you will pay for it.”
- “Try not to use Wolfram Alpha!”
- “Webwork will take longer than you expect!”
- “Stay on top of your webwork! Also, form a study group (no more than 5 people) really helps make doing the work less painful and doable. As a group, go to math tutoring together. With 4-5 brains, Webwork gets done every time with near scores of 100%!”
- “Give yourself 2-3 hours per webwork assignment.”
- “Webwork and worksheets are hard. You will need to get help from prof. and tutors as well as fellow students. DO NOT study for tests on your own, always study with a group.”

regarding lectures....

- “Take good lecture notes since they will help a lot on the worksheets and Webwork.”
- “Lectures are really important! I rarely used the textbook. If you dont understand a topic, visit Prof.Johnsons office hours. She really helped clarify confusing subjects.”
- “Pay Attention To The Lectures and take lots of notes. Ask a lot of questions. Office hours are SUPER important.”
- “I personally never need a textbook, but lectures, though fast-paced, were very helpful/useful/informative. I couldnt make a lot of the office hours, but those that I went to were very helpful.”

regarding office hours and tutors...

- “Take advantage of the math tutors Sunday through Thursday night, as well as Professors office hours. Dont be afraid to ask questions, no matter how silly they may seem.”
- “Be assertive in office hours to make sure you get your questions answered.”
- “Go to office hours, make appointments to get extra help, also utilize the math tutors in Ford on the second floor. Ask questions!”

regarding worksheets...

- “Worksheets are soooo helpful. They always seem difficult at first, but taking advantage of office hours allowed me to complete them all and truly understand the lesson better as well.”
- “Study the worksheets. They are a good indicator of the kinds of problems that will be on the tests.”
- “Worksheets were the most challenging and brought my grade down the most.”

other comments...

- “Do not procrastinate. Stay on top of your work. The sections of 152 and 153 go by exceedingly quickly. The moment you lose pace with the class you will fall behind.”
- “Use your resources! Your professor, classmates, and tutors are your tools! Use them! Do not be afraid to ask for help!”
- “If confused, look on YouTube for helpful examples by PatrickJMT.”

### Important Dates:

- Sept 11: Last day to Add/Drop Math 152
- Sept 18: Last day to choose Credit/NoCredit for Math 152
- Sept 22: Math 152 Midterm Exam
- Sept 26: Last day to withdraw from Math 152
- Oct 16: Last day of Math 152
- Oct 17: Final Exam for Math 152
- Oct 18: First day of Math 153
- Oct 20: Mid-Semester Day - No classes
- Oct 31: Last day to Add/Drop Math 153
- Nov 7: Last day to choose Credit/NoCredit for Math 153
- Nov 13: Math 153 Midterm Exam
- Nov 15: Last day to withdraw from Math 153
- Nov 20-24: Thanksgiving Break
- Dec 8: Last day of classes
- FINAL EXAM for 9:10 Section of Math 153 is on Friday, Dec. 15, 8-11 am
- FINAL EXAM for 10:20 Section of Math 153 is on Thursday, Dec. 14, 8-11 am

MONDAY	WEDNESDAY	FRIDAY
Aug 28th <b>1</b> syllabus, 9.1 Parametric Equations	30th <b>2</b> 9.2 Tangents & Parametric Curves	Sep 1st <b>3</b> 5.1 Areas & Distances
4th <b>Labor Day</b>	6th <b>4</b> 5.2 Definite Integral	8th <b>5</b> 5.3 Total Change Thm
11th <b>6</b> 5.4 FUNdamental Theorem of Calc	13th <b>7</b> 5.5 U-Substitution	15th <b>8</b> 6.1 Integration by Parts
18th <b>9</b> 6.2 Trig Integrals & Substitution*	20th <b>10</b> 6.6 Improper Integrals	22nd <b>11</b> <b>152 Midterm Exam</b>
25th <b>12</b> 7.1 Area Btwn Curves & Parametric Curves	27th <b>13</b> 7.2 Volume	29th <b>14</b> 7.2 Volumes of Solids, disks & washers
Oct 2nd <b>15</b> 7.3 Volumes of Solids, shells	4th <b>16</b> 7.4 Arc Length & Average Value	6th <b>17</b> 7.6 Work Integrals
9th <b>18</b> 7.6 Work, 9.3 Polar Coords	11th <b>19</b> 9.3 Polar Coords & Polar Graphs	13th <b>20</b> 9.3 Polar Derivatives & Area
16th <b>21</b> Review <b>152 Final Exam, TUESDAY 7-9pm</b>	18th <b>22</b> 8.7 Taylor & Maclaurin Polynomials	20th <b>Midsemester Day</b>
23rd <b>23</b> 8.1 Sequences	25th <b>24</b> 8.1, 8.2 Sequences & Series	27th <b>25</b> 8.2 Series
30th <b>26</b> 8.3 Integral Test	Nov 1st <b>27</b> 8.3 Comparison Tests	3rd <b>28</b> 8.4 Alternating Series
6th <b>29</b> 8.4 Alternating Series Estimation	8th <b>30</b> 8.4 Absolute Convergence	10th <b>31</b> 8.4 Ratio Test
13th <b>32</b> <b>153 Midterm Exam</b>	15th <b>33</b> 8.5 Power Series	17th <b>34</b> 8.6 Rep Power Series
20th <b>Thanksgiving Break</b>	22nd <b>Thanksgiving Break</b>	24th <b>Thanksgiving Break</b>
27th <b>35</b> 8.7 Taylor & Maclaurin Series	29th <b>36</b> 8.8 Apps of Taylor Polys	Dec 1st <b>37</b> 8.8 Taylor's Remainder Thrm
4th <b>38</b> Fourier Series	6th <b>39</b> Fourier Series	8th <b>40</b> Fourier Series