

## PHYS 40 – CLASSICAL MECHANICS – SPRING 2018

Lectures: Shuhaw 1786 | TTh 12:00–1:30pm & TTh 1:30–3:00pm

Labs: Shuhaw 1782 | M 12:00pm–3:00pm & 3:00–6:00pm & T 3:00pm–6:00pm & Th 9:00am–12:00pm

Discussions: Shuhaw 1783 | Th 3:00–4:00pm & 4:00–5:00pm

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**Instructor:** Saska Gjorgjievska, Shuhaw 1774, sgjorgjievska@santarosa.edu, Tel: 707-527-4637

**Office Hours:** M 9:30 - 11:45 am & T 6:00 - 6:50 pm & Th 5:15 - 6:30 pm

**Prerequisites:** Completion of MATH 1A or higher (V2).

*Recommended Preparation:* One year of high school physics or PHYS 1.

**Course Description and Student Learning Outcomes:** This is a course intended for science and engineering students and will use vectors and calculus to investigate translational and rotational motion, work and energy, conservation of energy and momentum, static equilibrium and universal gravitation. Upon successful completion of this course you will be able to:

- Apply physical principles and laws of classical mechanics to analyze and solve physics problems in mechanics through critical thinking, problem solving, mathematical modeling, and laboratory experimentation.
- Design and assemble apparatuses to measure physical phenomena.
- Analyze and make meaningful comparisons between experiment and theory.
- Effectively communicate ideas and processes of physics.

The complete course outline is available at the SRJC homepage under “Academics” → “Course Outline Information”.

**Required Textbook:** *Physics for Scientists and Engineers with Modern Physics, Technology Update*, 9th edition, by Raymond Serway and John Jewett Jr. ISBN: 9781305401969.

On reserve for 2 hours at a time in Doyle Library (QC21.3 .S467 2014)

**Recommended Supplement:** *Study Guide with Student Solutions Manual for Serway and Jewett's Physics for Scientists and Engineers*, 9th edition, Volume 1. ISBN: 9781285071688.

**Other Required Materials:** Every class bring four colored 3 x 5 inch index cards (to be given in class), notebook, pencil, eraser, equation sheet, scientific calculator (graphing calculators are not allowed on an exam), ruler, 2 white 3 x 5 inch index cards.

**Class Website:** We will use Canvas for posting assignments, due dates, submitting quizzes, announcements, solutions to homework. You are responsible for keeping up-to-date.

Note: This course is taught in a format that combines four sections into one online course environment. In some instances, students in one section might be able to view or comment on the work of students in the other section. You will be informed should these instances occur. If you have any concerns about this, please contact me for more details.

### Assignments and Grading:

**Homework:** Homeworks is generally assigned weekly and you will have one week to complete the assignments. The assignments and the due dates will be posted on Canvas. The assignments will be due at the beginning of class. Late assignments **will not** be accepted unless an extension is approved in advance.

One homework, with the lowest score, will be dropped from your final homework score. For homework policy and grading see “Homework Guidelines“ on Canvas.

It is imperative that you do **all** of the assigned problems. This is how you get a grasp on the material and gain problem solving skills. The homework is the the essential part of your test preparation. Make sure you understand the concepts in each problem rather than looking for equations that might work.

**Reading:** Expect to read on average a chapter per week. Read the words, think about the concepts, vocabulary, do the examples, take notes, and try to answer the “Quick Quiz” questions. Reading is **absolutely** necessary for success in this class. I will plan lectures with the assumption that you have done the reading. Sometimes I will post videos that you will be required to watch as a part of the reading assignment and you’ll be quizzed on the content.

**Quizzes:** You will have weekly quizzes (3-10 min) which will be given at the beginning of the class period. The purpose of these is to check if you have read the textbook material and wathed any assigned videos **before** the lecture (see the class schedule below) and to check your conceptual understanding of the previously covered material. **NO** make-up quizzes. I will drop the lowest score.

**Participation:** You are expected to actively participate in class activities: group work, discussions, asking questions, and responding to questions. Participation points will be assigned based on work you do during lecture and discussions. You will be turning in completed in-class worksheets each week.

**Exams:** We will have 4 mid-term exams, and a comprehensive final exam. You must take all the exams. The exams will test your understanding of concepts and problem-solving skills similar to what you encounter in homework and other assignments. The exams will be closed book and closed notes. I will post an equation sheet on Canvas that you will print and bring to exam. Also bring a ruler, scientific calculator, pencil and eraser. Once I give the graded exams back, you will have two business days to appeal your grade, should you believe that it is incorrect. Be advised that just as I could give a higher grade in a review of the exam, I may see that a lower grade is deserved if I consider I have been originally too generous. Make-up exams will be given **only** under special circumstances of which I am notified **in advance**. If a notification in advance was not feasible, collect appropriate documentation and schedule a meeting with me.

**Laboratory:** You may only go to your registered section. PDF copies of the lab manual will be posted on Canvas. You must read the lab manual and complete any assigned pre-labs beforehand. Group labs are worth 10 points, to be turned in before leaving. Formal lab reports are worth 20 points and you will have one week to complete them. Prelabs are worth about 10 % of your lab grade. 1 point will be deducted for each late arrival. Reports must be typed, including equations. All reports are to be submitted electronically online. Please do not print out the lab manual using the lab’s printer or the Math Lab printer. If you miss a lab you get zero points for that report. I will drop the lowest group (not formal) lab report.

### Grading Scale

Your total grade is based upon:		GRADES:	
Quizzes:	5%	90-100%	A
Participation:	5%	80-89%	B
Homework:	15%	70-79%	C
Lab:	20%	60-69%	D
Mid-term exams:	45%	0-59%	F
Final Exam:	10%		

## Course Policies:

*Attendance and Conduct:* Attendance is **mandatory** in lecture, lab and discussions. Students who fail to attend the first class meeting may be dropped by the instructor. No-Shows will be dropped immediately after the second meeting. I may drop you if you have more than 6 total absences not excused in advance. If you do miss a class you are responsible for all announcements and material covered in your absence. If you decide to discontinue this course, it is your responsibility to officially drop it.

Using cell phones, headphones, and similar electronic devices is not allowed during class. Set your phone on vibration for in case of emergency notification and stow it away. Conduct yourself according to the SRJC Student Conduct rules and be respectful of others. No disruptive behavior will be tolerated—I reserve the right to ask you to leave the classroom and you will lose participation points or the behavior may result in disciplinary action.

You will be frequently required to work in groups, in the laboratory and in the classroom. Make sure you always sit near other classmates.

*Academic Integrity:* Cheating, plagiarism, collusion, and other academic misconduct will not be tolerated. Please consult section 3.11P of the Academic Policy in the Policy Manual for definitions and procedures. The instructor reserves the right to award zero credit in the event of academic misconduct.

*Special Needs:* Students with disabilities are encouraged to contact the Disability Resources Department (DRD) to verify their eligibility for appropriate accommodations and provide me with the Authorization for Academic Accommodations letter. Except for unusual circumstances, request for academic accommodations are to be made during the first three weeks of the semester.

**Getting Help:** Ask for help as soon as you need it: come see me during office hours or e-mail me, I respond within 48 hours; go to the Tutorial Center (Doyle Library 4251), or the MESA Student Study Center (Bertolini 4832 ). **Do not fall behind!** Catching up is difficult and often impossible!

**Disclaimer:** This syllabus is intended to give you guidance in what may be covered during the semester and will be followed as closely as possible. However, I reserve the right to modify, supplement and make changes as the course needs arise.

## Important Dates:

Class begins .....	1/17/2018
Last day to add without instructor's approval .....	1/21/2018
Last day to drop for refund .....	1/28/2018
Last day to add with instructor's approval .....	2/4/2018
Last day to drop without W .....	2/4/2018
Last day to drop with W .....	4/22/2018
Last day of classes .....	5/17/2018
Final exam .....	5/24/2018

**Tentative Schedule (it may change):**

TUESDAY	THURSDAY	LAB
<div style="border: 1px solid black; display: inline-block; padding: 2px;">Jan 16th</div> <b>No Class</b> PDA	18th Velocity & Acceleration 2.1 - 2.4	
23rd Free Fall & Motion With Constant Acceleration 2.5 - 2.8	25th Vectors 3.1 - 3.4	Lab 1: Uncertainty in Measurement
30th Motion in 2D 4.1 - 4.3	<div style="border: 1px solid black; display: inline-block; padding: 2px;">Feb 1st</div> Projectile & Circular Motion 4.4 - 4.5	Lab 2: Motion
6th Relative Motion & Review 4.6	8th Newton's Laws 5.1 - 5.5	Lab 3: Projectile Motion
13th <b>Exam 1</b> Chapters 1 - 4	15th <b>No Class</b> Flex Day	Lab 4: Computation
20th Newton's Laws and Applications 5.6 - 5.8	22nd Friction, Drag & Circular Motion 6.1 - 6.4	Lab 4: Computation
27th Work by Constant Force & Scalar Product 7.1 - 7.3	<div style="border: 1px solid black; display: inline-block; padding: 2px;">Mar 1st</div> Work by Varying Force & Kinetic & Potential Energy 7.4 - 7.6	Lab 5: Force Table
6th Conservative and Nonconservative Forces & Energy Diagrams 7.7 - 7.9	8th Catch Up/Review	Lab 6: Air Resistance
13th <b>Exam 2</b> Chapters 5 - 7.6	15th Conservation of Energy 8.1 - 8.5	Lab 7: Atwood Machine
20th <b>No Class</b> Spring Break	22nd <b>No Class</b> Spring Break	<b>No Labs</b> Spring Break
27th Linear Momentum & Impulse 9.1 - 9.3	29th Collisions & Center of Mass 9.4 - 9.6	Lab 8: Conservation of Energy
<div style="border: 1px solid black; display: inline-block; padding: 2px;">Apr 3rd</div> Center of Mass & Systems of Particles 9.6 - 9.9?	5th Catch Up/Review	Lab 9: Collisions

TUESDAY	THURSDAY	LAB
10th <b>Exam 3</b> Chapters 7 - 9	12th Rotational Motion 10.1 - 10.3	Lab 10: Springs and Energy
17th Torque, Rotational Inertia & Newton's 2 <sup>nd</sup> Law 10.4 - 10.6	19th Energy in Rotational Motion & Rolling Motion 10.7 - 10.9	Lab 11a: Moment of Inertia
24th Vector Nature of Torque & Angular Momentum 11.1 - 11.3	26th Conservation of Angular Momentum & Gyroscopes 11.4 - 11.5	Lab 11b: Moment of Inertia
May 1st Equilibrium & Elasticity 12.1 - 12.4	3rd Catch Up/Review	Lab 12: Static Equilibrium
8th <b>Exam 4</b> Chapters 10 - 12	10th Law of Universal Gravitation 13.1 - 13.3	Lab 13: TBA
15th Kepler's Laws & Gravitational Potential Energy 13.4 - 13.5	17th Planets, Orbits & Energy 13.6	TBA
22nd	24th <b>Final Exam</b> 10:00-12:45pm & 1-3:45pm	