

**San José State University
Mechanical Engineering Department**

**ME 165
(3-units)**

**Computer-Aided Design in Mechanical Engineering
Section 01 (24417)
Section 02 (25366)
Spring 2022**

Course and Contact Information

Instructor: Dr. Susan M. Bowley

Office Location: Online only

Telephone: (202) 538-4432 (Mobile/Cell)

Email: susan.bowley@sjsu.edu

Office Hours: **Online Live (via Zoom):**
Mondays 4:30pm-5:30pm (After Class)
Anytime via email (preferred);
By Appointment (Email me to setup)

Class Days/Time: **Online Live (via Zoom) and Pre-Recorded – Classes/Quizzes/Exams:**
Section 01: Mondays 1:30-4:15pm
Section 02: Tuesdays 1:30-4:15pm

Classroom (Canvas): Section 01: <https://sjsu.instructure.com/courses/1472817>
Section 02: <https://sjsu.instructure.com/courses/1472036>

Prerequisites*: ME 020, CE 112, ME 130 or MATH 129A

*** You must turn in an unofficial transcript with the prerequisites highlighted (or equivalent courses indicated) by the date specified on Canvas, or you will be dropped from the class.**

Course Format – Technology Intensive, Hybrid, and Online Courses

This is an online class only with no on-campus meetings. You must have reliable Internet connectivity, a Windows-based computer (running Windows 10), a downloaded copy of **SolidWorks 2021 (serial number provided via Canvas)**, and all required textbooks (print or eBook) in order to participate and successfully pass this course. All course materials developed by your instructor are the intellectual property of the instructor and are to be used for private, study purposes only, and cannot be shared publicly or uploaded without the instructor's prior approval. **All Exams are given via Zoom and live during class meeting times and are proctored by your Faculty Instructor. Quizzes and Live Lecture Sessions are also done via Zoom. You must have a reliable internet connection and working web camera for all online Zoom sessions. Please refer to the Online Policies section below for additional**

details. A free equipment loan program is available to Students via <https://www.sjsu.edu/learnanywhere/equipment/index.php>.

Canvas Course Website

All materials for this course will be available inside the Canvas course website noted above, however **textbook materials must be downloaded from the publisher's website.** Course materials will include: Syllabus, Assignments, Handouts, Videos, and Course Notes. You are responsible for regularly checking for due dates of Assignments and Course Materials through the Canvas course website.

Course Description

Theory and application of CAD. 2-dimensional and 3-dimensional modeling, commercial CAD software. Application to finite element analysis.

Prerequisite: ME 020, CE 112, and either ME 130 or MATH 129A, with a grade of C- or better in each. Allowed Declared Majors: Aerospace Engineering, Mechanical Engineering

Course Goals and Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

1. Describe the role of computer-aided design in practice of mechanical engineering, as well as the basic requirements of software and hardware for computer-aided design.
2. Exercise proficiency in creating computer-aided design models for mechanical engineering parts, drawings, and assemblies, using modern commercial CAD software.
3. Utilize analysis tools such as finite element methods and mechanism modeling in conjunction with computer-aided design software tools for advanced design of mechanical engineering components.

Required Texts/Readings

Textbooks:

1. **REQUIRED – [Beginner's Guide to SOLIDWORKS 2021 – Level I. Parts, Assemblies, Drawings, PhotoView 360 and SimulationXpress.](#)**

By Alejandro Reyes MSME, CSWE, CSWI

Net Price: \$42.00

Published January 8, 2021

792 Pages

Binding: Paperback

Printing: Black and White

Print ISBN: 978-1-63057-386-7 | ISBN 10: 1630573868

eBook ISBN: 978-1-63056-637-1

2. **REQUIRED – [Official Guide to Certified SOLIDWORKS Associate Exams: CSWA, CSWA-SD, CSWSA-FEA, CSWA-AM SOLIDWORKS 2019 – 2021.](#)**

By David C. Planchard CSWP

Net Price: \$36.00

Published November 24, 2020

464 Pages

Binding: Paperback

Printing: Black and White
Print ISBN: 978-1-63057-421-5 | ISBN 10: 163057421X
eBook ISBN: 978-1-63056-634-0

3. REQUIRED – Analysis of Machine Elements Using SOLIDWORKS Simulation 2021

By Shahin S. Nudehi Ph.D., P.E., John R. Steffen Ph.D., P.E.

Net Price: \$38.00

Available June 16, 2021

550 Pages

Binding: Paperback

Printing: Black and White

Print ISBN: 978-1-63057-379-9 | ISBN 10: 1630573795

eBook ISBN: 978-1-63056-645-6

Other technology requirements / equipment / material:

- **A Serial Number and instructions to download the 2021 Educational Version of SolidWorks will be provided to all students registered in the Canvas course. You must have this version to complete exercises for this class. This student license is good for 1-year.**
- Webcam or working cell phone camera are required for all Live Classes/Quizzes/Exams.
- A PC running Windows 10 is required.
- **Reliable internet connectivity is required. If this may be an issue, Students must inform the Instructor as soon as possible to assist you in determining alternatives.**
- **My.SolidWorks.Com Access. Access after Serial Number Provided.**

Online Policies (applies to all Live Classes/Quizzes/Exams):

- **Arrive 15 minutes early.**
- Webcam or cell phone cameras are required to be on and showing each student during each session. Please contact your instructor in advance if you have any concerns.
- Each session will be recorded, including the webcam images, and may be posted to the Canvas class site. You will be provided with a consent form to complete prior to these recordings being shared in Canvas. Please contact your instructor in advance if you have any concerns.
- Students are not allowed to record any course materials without advance permission from your Instructor. If recordings are allowed, any recordings are to be used for student's private study purposes only and cannot be shared. Students who violate these policies will be referred to the Student Conduct and Ethical Development Office.
- Your Instructor may use students' videos and recordings for further investigation if cheating is suspected and recordings may become part of the student's administrative disciplinary record.
- If students experience unexpected interruptions during any session, including Quizzes and Exams, students should contact the Instructor immediately.

Zoom Classroom Etiquette:

1. **Arrive 15 minutes early.**
2. **Mute your Microphone:** To help keep background noise to a minimum, make sure you mute your microphone when you enter a Zoom session and when you are not speaking.
3. **Be Mindful of Background Noise and Distractions:** Find a quiet place to attend class to the greatest extent possible.
 - Avoid video setups where people may be walking behind you, or people talking/making noise, etc.
 - Avoid activities that could create additional noise, such as shuffling papers, listening to music in the background, etc.
4. **Position your Camera Properly:** Be sure your webcam is in a stable position and focused at eye level.
5. **Limit your Distractions and Avoid Multitasking:** You can make it easier to focus on the session by turning off notifications, closing or minimizing running apps, and putting your cell phone away (unless you are using to access Zoom).
6. **Use Appropriate Virtual Backgrounds:** If using a virtual background, it should be appropriate and professional and should not suggest or include content that is objectively offensive or demeaning.

Online Exams/Quizzes:

Testing Environment:

- **Arrive 15 minutes early.**
- **Canvas interface is required (under "Quizzes").**
- **Zoom registration may be required.**
- **Only one computer monitor is allowed (no dual monitors).**
- **No earbuds, headphones, or headsets are allowed.**
- **The environment must be free of any other people beyond the student taking the exam.**
- **No other web browser or windows besides Canvas or the test environment should be open.**

- **All students will be required to share their computer desktop and webcam.**
- **A workplace that is clear of clutter (i.e. remove reference materials, notes, textbooks, cell phones, tablets, smart watches, additional monitors, etc.)**
- **A well-lit environment where each student's face and eyes are visible. Avoid backlight from a window or other light source opposite the camera.**
- **Personal calculators – only if indicated by the Instructor in advance.**
- **Students must remain in the testing environment throughout the duration of the test. If a bathroom break is needed you must inform the Instructor prior to leaving the test environment.**
- **Any emergency situations (such as loss of internet) must be reported to your instructor via email immediately.**

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the [current academic calendar](http://www.sjsu.edu/academic_programs/calendars/academic_calendar/) web page located at http://www.sjsu.edu/academic_programs/calendars/academic_calendar/. The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes. Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

Course Requirements and Assignments

Course Assignments are provided through the Canvas course site. All materials are directly aligned with course learning outcomes noted above. The Detailed Tentative Course Schedule noted below indicates materials to be covered.

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus. **Therefore, you should plan to spend at least 9-10 hours per week on this 3-unit course.**

Final Examination or Evaluation

Final Exam will be administered via Zoom and Canvas and will take place on:

Section 01 (Mondays): Friday May 20, 12:15pm-2:30pm

Section 02 (Tuesdays): Monday May 23, 12:15pm-2:30pm

Grading Information

Design Projects	20%
Exam 1 – CSWA	30%
Exam 2 – CSWA-S (FEA)	30%
Final Exam	20%
TOTAL	100%
Extra Credit	+0-5%

Grading Policy:

A+ above 100%	A from 100% to 94%	A- from 93% to 90%
B+ from 89% to 87%	B from 86% to 84%	B- from 83% to 80%
C+ from 79% to 77%	C from 76% to 74%	C- from 73% to 70%
D+ from 69% to 67%	D from 66% to 64%	D- from 63% to 60%
F below 60%		

This course must be passed with a C- or better as a CSU graduation requirement.

Class Meetings, Class Participation, Quizzes, Design Projects, Exams, and Extra Credit:

- 1. Class Meetings:** These are a combination of live sessions that meet at the scheduled day and time via online sessions and pre-recorded sessions that you need to watch on your own time.
- 2. Class Participation:** This is an evaluation of your participation during live class meetings through submission of in-class work done via interactions with peers and your instructor live during class.
- 3. Quizzes:** These will provide periodic evaluation of your course progress and help prepare you for the Exams. All Quizzes are via Canvas and Proctored.
- 4. Design Projects:** These are an evaluation of your design skills, creativity, and application of skills covered in this course and involve Manufacturing and creating a working physical prototype. These are intended to add to your professional/career portfolio.
- 5. Exams:** There will be **Two (2) Exams via Canvas and a testing application**. There are no make-up exams. **Exams will be cumulative, closed book and closed notes and are Proctored. If you do not attend an Exam, you will receive zero credit.**
 - **Exam 1 – CSWA (Certified SolidWorks Associate) Exam (3 hours)**
 - **Your Exam 1 grade will be your score on the certification exam (currently out of 240 points).**
 - **Exam 2 – CSWA-Simulation (Finite Element Analysis) Exam (2 hours)**
 - **Your Exam 2 grade will be your score on the certification exam (currently out of 100 points).**

6. **Final Exam:** The Final Exam will be cumulative, taken via Canvas, and Proctored.
 - If you **PASS (>70%) BOTH** Exam 1 – CSWA Exam, **AND** Exam 2 – CSWA-Simulation Exam, **you do NOT need to attend the Final Exam and you will receive 100% on the Final Exam. Also, you will be provided with a FREE Certification Voucher for another SW Certification Exam (ONE of the following: CSWP – Professional, CSWA – Additive Manufacturing, CSWA – Electrical, or CSWA – Sustainability)**
 - If you **FAIL (<70%) EITHER** Exam 1 – CSWA Exam, **OR** Exam 2 – CSWA-Simulation Exam, **you must take/attend the Final Exam.**
 - If you **must attend/take the Final Exam** and if you **do not attend**, you will receive a **zero on the Final Exam.**
7. **Extra Credit:** Assigned during the semester at instructor’s discretion. All Extra Credit assignments will be due as indicated in Canvas.
8. The only way to learn is through practice, so make time to complete work regularly and on time.
9. **All Submissions will be through the Canvas website and must have your Initials_Assignment_Date format (e.g. SMB-HW1-Ex1-2.3.21). Be sure the file name is NOT excessively long otherwise it cannot be reviewed, and you will receive a zero grade. No ZIP files are allowed unless specifically indicated in the Assignment. If you submit a ZIP file when not allowed, you will receive a zero grade.**
10. No makeup exams or final exams will be given except for emergency situations.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs’ [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>”

Academic integrity

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The [University’s Academic Integrity policy](http://www.sjsu.edu/senate/S07-2.htm), located at <http://www.sjsu.edu/senate/S07-2.htm>, requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sa.sjsu.edu/judicial_affairs/index.html) is available at http://www.sa.sjsu.edu/judicial_affairs/index.html.

Instances of academic dishonesty will not be tolerated. **Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person’s ideas without giving proper credit) will result in a failing grade and sanctions by the University.** For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU’s Academic Policy S07-2 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment

with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with the [Accessible Education Center](http://www.sjsu.edu/aec) (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability.

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Tentative Course Schedule

Subject to Change via Canvas course website

Week	Date	Topics, Readings, Assignments, Deadlines
1	1/31/22	<ul style="list-style-type: none"> • Canvas Class Opens (1/26/22) • Prerequisites: Submit proof of Prerequisites • ACCESS MYSOLIDWORKS.COM • Download and install SolidWorks 2021 (Provided individually once Prerequisites verified by Instructor) <p>Lecture: Introduction/Orientation to Course and Online Format; Overview of Part Modeling and Engineering Drawings; Chapter 2, Level I Textbook Suggested Work (completed on your own, NO Submission):</p> <ul style="list-style-type: none"> • SW Tutorials 1; Level I Text – Chapter 2: Part Modeling
2	2/7/22	<p>Lecture: Chapter 2, Level I Textbook Suggested Work (completed on your own, NO Submission):</p> <ul style="list-style-type: none"> • Level I Text – Chapter 2: Part Modeling
3	2/14/22	<p>Lecture: Chapter 3 and 4, Level I Textbook Suggested Work (completed on your own, NO Submission): Level I Text – Chapter 3: Special Features: Sweep, Loft and Wrap, Chapter 4: Detail Drawings</p>
4	2/21/22	<p>Lecture: Chapter 5 and 6, Level I Textbook Suggested Work (completed on your own, NO Submission):</p> <ul style="list-style-type: none"> • Level I Text – Chapter 5: Assembly Modeling, Chapter 6: Assembly and Design Table Drawings
5	2/28/22	<p>Lecture: Overview of CSWA Certification Exam (Exam 1); Chapter 2 and 3, Official Guide to Certified SW Associate Exams Text Suggested Work (completed on your own, NO Submission):</p> <ul style="list-style-type: none"> • Official Guide to Certified SW Associate Exams Text – Chapter 2: CSWA Introduction & Drafting Competencies and Chapter 3: Basic Part & Intermediate Part Creation & Modification
6	3/7/22	<p>Lecture: Chapter 4 and 5, Official Guide to Certified SW Associate Exams Text Suggested Work (completed on your own, NO Submission):</p> <ul style="list-style-type: none"> • Official Guide to Certified SW Associate Exams Text – Chapter 4: Advanced Part Creation & Modification and Chapter 5: Assembly Creation & Modification
7	3/14/22	<p>Lecture: Review for CSWA Certification Exam (Exam 1) – Parts, Drawings & Assemblies; TangixTesterPro Download and Install (Personal Computer); CSWA Sample Exam (via TaxgixTesterPro Application)</p>
8	3/21/22 and 3/22/22	<p>Exam 1 – CSWA Exam (3 hours)</p>
9	3/28/22-4/1/22	<p>SPRING BREAK – NO CLASSES</p>
10	4/4/22	<p>Lecture: Overview and Introduction to Finite Element Analysis (FEA) Methods; Overview of SolidWorks Simulation Analysis Add-On; Chapters 1 and 2, Analysis of Machine Elements Text Suggested Work (completed on your own, NO Submission):</p> <ul style="list-style-type: none"> • SW Sim Tutorials 1 • Analysis of Machine Elements Text – Chapters 1 & 2

Week	Date	Topics, Readings, Assignments, Deadlines
11	4/11/22	Lecture: Chapter 3 and 4, Analysis of Machine Elements Text Suggested Work (completed on your own, NO Submission): <ul style="list-style-type: none"> • SW Sim Tutorials 2 • Analysis of Machine Elements Text – Chapters 3 & 4
12	4/18/22	Lecture: Chapter 5, and 6, Analysis of Machine Elements Text Suggested Work (completed on your own, NO Submission): <ul style="list-style-type: none"> • Analysis of Machine Elements Text – Chapters 5 & 6
13	4/25/22	Lecture: Chapter 7, Analysis of Machine Elements Text Suggested Work (completed on your own, NO Submission): <ul style="list-style-type: none"> • Analysis of Machine Elements Text – Chapter 7
14	5/2/22	Lecture: Overview of CSWA-S Certification Exam (Exam 2) – SW Simulation/FEA Focus; Chapter 7, Official Guide to Certified SW Associate Exams Text Suggested Work (completed on your own, NO Submission): <ul style="list-style-type: none"> • Official Guide to Certified SW Associate Exams Text – Chapter 7: Certified SolidWorks Simulation Associate – Finite Element Analysis (CSWA-S) Exam
15	5/9/22 and 5/10/22	Exam 2 = CSWA-Simulation Exam (2 hours)
16	5/16/22 – Last Day of Classes (Monday)	Lecture: Review for Final Exam - Cumulative
Final Exam	*Final Exam will be administered via Zoom and Canvas and will take place on: Section 01 (Mondays): Friday May 20, 12:15pm-2:30pm Section 02 (Tuesdays): Monday May 23, 12:15pm-2:30pm *ONLY students who do not obtain a “Passing Score” (>70%) on BOTH CSWA Exam AND CSWA/S Exam MUST take the Final Exam.	