

The Stuff You Will Actually Read3 Keys to Success in Studying Engineering:

- 1) Effort = Work Hard
- 2) Approach = Work Smart (Study Groups, 50% to 100% of the time you study)
- 3) Attitude = Think Positively

Auto-Forward your SBCC PipeLine E-mail (to be kept up-to-date on important Engineering info)

Sign up for AlertU.com (to be alerted via text messaging to your cell phone if SBCC is closed due to fire, power outage, etc. – easy to sign up on your PipeLine login page).

**Santa Barbara City College**

1/24/2012

SYLLABUS:**Engineering 116, Dynamics**

4 Units, Spring 2012, Section CRN # 55496

- Bring this syllabus to class **every day!!!**
- If you lose your syllabus, print your own copy from the Engineering web site (listed below). Solutions to the Course Work (CW) are posted on the web site.
- All your **work** must be written in **pencil** – **notes & corrections** must be written in **pen**.

INSTRUCTOR:

Dr. Nick Arnold

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PS 118

Phone:

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Web Site:

<http://science.sbcc.edu/physics/engineering/> (**SOLUTIONS POSTED HERE**)

Office Hours:

Tues.: 12:20-12:45 & 1:45-2:10 PM; Wed.: 2:05-2:55 PM;  
Thurs.: 12:20-12:45 & 1:45-2:10 PM; Fri.: 2:05-2:55 PM.CLASS MEETINGS:

TThF 11:10-12:20 PM in PS 128

TEXT(S):Engineering Mechanics, 6th Ed, Dynamics, Meriam & Kraige, 2007, Wiley,**ISBN-13:** 978-0471739319 or **ISBN-10:** 0471739316ENGR 116, Dynamics, Bookstore Packet, Nick ArnoldSUGGESTIONS FOR STUDYING:

- **This class is essentially an upper-division or university level class (i.e., more in-depth study and more challenging problems). → If you are not ahead, then you are behind! Note also that ENGR 115 (Statics) is a Prerequisite.**

- Attend class regularly – this is one of the highest indicators of student success!

- **Read the book before it is covered in class (Reading Questions will be assigned).**

- Spend time solving the assigned problems – work additional problems if needed.

- **Work in STUDY GROUPS!!!**

- If you miss a class, get the notes from a Study Group partner (make arrangements early in the semester).
- See me during office hours for help or clarifications.
- Check your SBCC Pipeline account (you can set up a forwarding address) for updates.

**PREREQUISITE(S):** Engineering 115 (Statics) and Math 160 (Calculus II).

**COURSE DESCRIPTION:**

Study and analysis of motions of particles and rigid bodies. Velocity, acceleration, relative motion, work, energy, impulse, and momentum. Vector mathematics where appropriate.

Student Learning Outcomes (SLO's) are results at the end of the semester that we want students to know after finishing the course (with a grade of 'C' or better), and for faculty to measure, for the sole purpose of improving student attainment of these desired competencies. SLO's are to be over-arching – i.e., general ideas that usually cover more than one specific course topic.

**SLO's for ENGR 116**

SLO #	Description	Measure
1	Develop analysis methods to examine and evaluate kinematic (motion) quantities of particles and rigid bodies (velocity, acceleration, radius of curvature, relative motion, first and second derivatives).	Reading Questions/Graded Problems/Course Work assignments, quizzes, Exams 1, 2 and 4.
2	Apply Newton's second law, work-energy, and impulse-momentum methods to evaluate reaction forces and subsequent motion of particles and rigid bodies acted upon by force-couple systems.	Reading Questions/Graded Problems/Course Work assignments, quizzes, Exams 3 and 5.
3	Analyze the behavior of oscillatory systems.	Reading Questions/Graded Problems/Course Work assignments, quizzes.
4	Develop teamwork and technical writing skills to be successful on an engineering design team.	"Table Climber" design project.

**“SBCC students with disabilities who are requesting accommodations for classes, college activities or tests should use the following SBCC procedure. (NOTE: This procedure also includes student requests to bring into classes personal service attendants who are not SBCC employees. This procedure also includes student requests to bring service animals into classes.)**

**[1] Contact Disabled Student Programs and Services (DSPS).**

**[2] Submit documentation of your disability to the DSPS office.**

**[3] Communicate with a DSPS counselor regarding options for services and accommodations.**

**[4] Reach written accommodation agreement with the DSPS counselor and your instructor.**

**Contact: DSPS office (805) 965-0581 x 2364, SS Building, room 160, [dspshelp@sbcc.edu](mailto:dspshelp@sbcc.edu)**

**SBCC requests you complete this process at least ten working days before your accommodation is needed, in order to allow DSPS staff time to provide your accommodation.”**

**GRADING:**

Reading Questions/Graded Problem(s)/Course Work <sup>1</sup>	10%	A: 90–100%
Quizzes/Computer <sup>2</sup>	25%	B: 80–89%
Exams <sup>3</sup>	60%	C: 70–79%
<u>Team Project</u> <sup>4</sup>	5%	D: 60–69%
Total	100%	F: 0–59%

You are required to do all of your work in pencil (assignments, quizzes, and exams) – notes and corrections must be done in pen.

<sup>1</sup> Reading Questions/Graded Problem(s)/Course Work will be weighted equally:

- Reading Questions (RQ) will be assigned each day to help focus your reading of the textbook concepts before the next class meeting.
- Graded Problem(s) (GP): One or more problems will not have the solutions posted on the ENGR web site, and (in general) will not have an answer in the text – these problems will be corrected and scored.
- Course Work (CW) will be not be corrected, but will be examined and scored as follows:

check+	10 points	all problems completed, organized and neat
check	8 points	all problems completed
check–	6 points	problems not completed

It is your responsibility to confirm that you have done the CW correctly (by asking questions in class, comparing your work to other students, etc.)

All CW must conform to the following standards: Name, class, and assignment number in the upper right corner of the page, and the problem assignment just above the top line of the page. For example:

<b>First &amp; Last Name</b> <b>ENGR 116</b> <b>CW #2</b>	<b>Problems 2/ 1, 5, 9, 22</b>
<b>2/1</b> Info Given: ....	

The **RQ/GP/CW** must be **stapled in that order** as a **single assignment**, using **standard 8.5”x11” paper**, and **not** folded. I recommend that you purchase a small stapler and carry it with you. Please identify the Assignment and Assignment # for the GP in the same standard as the CW. Please write on only one side of each sheet.

<sup>2</sup> The quizzes will be on recent material, and most or all of the quizzes will not be announced. You will be allowed to view your class notes for taking quizzes. There will also be computer assignments in MatLab that will be counted as part of your overall quiz score.

<sup>3</sup> One sheet of notes (one side only) is allowed for exams (only formulas — solved problems are not allowed). The sheet of notes must be stapled to the exam. The Final will count as one exam. All calculations must begin with a defining equation for full credit.

<sup>4</sup> If you miss the date of the "Team Project", you will have to make it up by doing a special report.

**WEEKLY COMMITMENT:**

4 hours in class plus approximately 8 to 12 hours of reading and assignments.

**ATTENDANCE POLICY:**

The instructor may drop you after a total of 3 absences. If you decide to drop this class, it is your responsibility to withdraw prior to the deadlines published in the schedule of classes.

**POLICY ON CHEATING:**

You are encouraged to work together in solving assigned problems, but you must generally write the answers in your own words. **NEW: ZERO TOLERANCE POLICY for cheating on exams, quizzes, or computer assignments – you will receive an “F” in the class – don’t take any chances – I will not waste my time and other student’s time.**

**CALCULATORS:**

Students may use any calculator for Course Work (CW) assignments, quizzes, and exams – however, you may not use any built-in or written programs to compute or check calculations.

**POLICY ON MAKE-UPS:**

Assignments (Reading Questions/Graded Problem(s)/Course Work) will be accepted late, but only counted as 50% maximum credit, and it will not be graded, just scanned for completeness. Some number (TBD – To Be Determined) of your lowest scoring Course Work’s and Reading Questions will not be counted.

Computer assignments will be accepted late, with a penalty as follows:

- **-10%** if turned in **within 1 week** after the due date.
- **-20%** if turned in **more than 1 week** after the due date.

No make-up quizzes allowed. However, some number (TBD) of your lowest scoring quizzes will not be counted — therefore, if you miss a quiz, that quiz will not be used in determining your quiz total; however, if you miss more than the number of quizzes not counted, zero scores will be counted for the missed quizzes.

No make-up or early exams allowed. However, there may be opportunities to re-take a missed or low-scoring exam, at the discretion of the instructor (if you miss an exam and/or re-take by verified medical or other emergencies, then a make-up exam may be given at the discretion of the instructor). The Final will be counted as one exam. The Final may be essentially a re-take of the last exam – if that is the case, if you do well on the last exam, you may not have to take the final (however, you will still be responsible for the all of the material covered up to the final, including CW/RQ/GP assignments, computer assignments, and quizzes).

**POLICY ON CELL PHONES:**

The ringing of cell phones, pagers, etc., disrupts class or lab and is discourteous to everyone. Please turn them off before entering class or lab, and do not use them in either place

**ADDITIONAL REFERENCES:**

- Engineering Mechanics, Dynamics, Riley & Sturges, 1995, Wiley.

**Great Reference! Older editions are perfectly okay to use, and will cost less on Amazon.com**

- Engineering Mechanics, Dynamics, Bedford & Fowler, 1995, Addison Wesley.
- Vector Mechanics for Engineers, Dynamics, 6th Ed, Beer & Johnston, 1997, McGraw Hill.
- 700 Solved Problems in Vector Mechanics for Engineers : Dynamics, Shelley, 1991, WCB/McGraw-Hill.

**SCHEDULE (AT A GLANCE):**

Wk.	Date	Material Covered (Approx.)
1	1/24	1.1-1.7
	1/26	2.1-2.2 (attempt all of the assignment for 2.2 by Friday, but will be given more time if needed)
	1/27	2.2 (continued) <b>Demo for MatLab #1.</b>
2	1/31	2.3-2.4
	2/2	2.5 (attempt all of the assignment for 2.5 by Friday, but will be given more time if needed)
	2/3	2.5 (continued) <b>Demo for MatLab #2.</b>
3	2/7	2.6 (the assignment for 2.6 won't be due until next week, after Exam 1)
	2/9	2.6 (continued)
	2/10	(In class work)
4	2/14	2.7
	2/16	(In class work)
	<del>2/17</del>	Holiday
5	2/21	2.8
	2/23	2.9
	2/24	3.1-3.4
6	2/28	<b>Exam 1: Chapters 1 &amp; 2</b>
	3/1	3.5
	3/2	3.6-3.7
7	3/6	3.7 (continued)
	3/8	3.8-3.9
	3/9	(In class work)
8	3/13	3.10
	3/15	3.12
	3/16	4.1-4.2, <b>Table Climber Design Begins.</b>
9	3/20	4.3-4.5
	3/22	5.1-5.2, <b>Table Climber Design Status Report #1 Due. Table Jumper Video</b>
	3/23	<b>Exam 2: Chapter 3.</b>
	<del>3/27</del>	<b>Spring Break</b>
	<del>3/29</del>	
	<del>3/30</del>	
10	4/3	5.2 (continued)
	4/5	5.3
	4/6	5.4, <b>Table Climber Design Status Report #2 Due.</b>
11	4/10	5.5
	4/12	5.6
	4/13	<b>B.1, Table Climber Design Status Report #3 Due.</b>
12	4/17	6.1-6.3
	4/19	6.4, <b>Table Climber Design Status Report #4 Due.</b>
	4/20	<b>Exam 3: Chapter 5.</b>
13	4/24	6.5
	4/26	6.6
	4/27	<b>Table Climber Testing. Table Climber Project Report due.</b>
14	5/1	6.8
	5/3	8.1-8.2
	5/4	<b>Exam 4: Chapter 6.</b>
15	5/8	8.3
	5/10	(In class work)
	5/11	(In class work)
F	5/15	-----
	5/17	<b>Final: Chapter 6 &amp; Chapter 8.</b>
	5/18	<b>SBCC Commencement</b>

**Final, Thursday 5/17/2012, 11:00 AM – 1:00 PM (Chapter 6 & Chapter 8)**

SCHEDULE (DETAILED) WITH ASSIGNMENT DUE DATES:TEXT: Engineering Mechanics, 6th Ed, Dynamics, Meriam & Kraige, 2007, Wiley.

<u>Week #</u>	<u>Due Date</u>	<u>CW #</u>	<u>Sect.</u>	<u>Page</u>	<u>Assignment</u>	<u>Graded Problem</u>	<u>Reading Questions</u>
1	1/24				First day; no assignment due.		
	1/26	1	1.8	18	1/ 1, 2 (for 180lbs=>m=5.59slugs, w=801N, m=81.6kg), 7, 13	1/12	2.1-2.2
	1/27				Demo for MatLab Assignment #1		
2	1/31	2	2.2	31	2/ 1, 5, 9, 22 MatLab Assignment #1 due.	2/28	2.3-2.4
	2/2	3	2.4	48	2/ 62, 69, 80, 100**	2/76	2.5
	2/3				Demo for MatLab Assignment #2		
3	2/7	4	2.5	60	2/ 101, 103, 105, 117 (hints in class for graded problem) MatLab Assignment #2 due.	2/126	2.6
	2/9				(In class work)		
	2/10				(In class work)		
4	2/14	5	2.6	73	2/135, 138, 147, 161	2/154	2.7
	2/16	6	2.7	86	2/173, 174, 176, 182 (use radians)	2/178	2.8
	2/17						
5	2/21				(In class work)		
	2/23	7	2.8	95	2/189, 192, 206	2/190	2.9
	2/24	8	2.9	104	2/213, 219, 228	2/222	3.1-3.4
6	2/28				<b>Exam 1: Chapters 1 &amp; 2</b>		
	3/1	9	3.4	131	3/2, 7, 17, 23	3/26	3.5
	3/2	10	3.5	144	3/49, 57, 61, 67	3/52	3.6
7	3/6	11	3.6	168	3/104, 105, 114, 126	3/116	3.7
	3/8	12	3.7	184	3/147, 151, 163	3/158	3.8-3.9
	3/9				(In class work)		
8	3/13	13	3.9	199	3/183, 193, 208, 222	3/188	3.10
	3/15	14	3.10	215	3/227, 233, 237	3/236	3.12
	3/16	15	3.12	227	3/251, 252, 262 Table Jumper Video	3/254	4.1-4.5
9	3/20	16	4.5	286	4/3, 7	4/6	
	3/22	17	4.5	287	4/10, 16 Table Climber Status Report #1 due.	4/14	5.1-5.2
	3/23				<b>Exam 2: Chapter 3</b>		
Spring Break	3/27						
	3/29						
	3/30						
10	4/3						
	4/5	18	5.2	339	5/2, 4, 23	5/18	5.3
	4/6	19	5.3	348	5/29, 36, 37 Table Climber Status Report #2 due.	5/48	5.4

\*\* Harder problems that will add to your understanding – do **not** have to be completed, but should at least be attempted.SCHEDULE (DETAILED) WITH ASSIGNMENT DUE DATES (Continued on next page):

**SCHEDULE (DETAILED) WITH ASSIGNMENT DUE DATES (Continued):**TEXT: Engineering Mechanics, 6th Ed, Dynamics, Meriam & Kraige, 2007, Wiley.

Week #	Due Date	CW #	Sect.	Page	Assignment	Graded Problem	Reading Questions
11	4/10	20	5.4	363	5/59, 60, 63, 83	5/66	5.5
	4/12	21	5.5	374	5/96, 100, 111	5/102	5.6
	4/13	22	5.6	386	5/123, 129, 145 (hint: find $\bar{a}_B$ 2 ways and equate) Table Climber Status Report #3 due.	5/128	B.1
12	4/17	23	B.1	670	B/ 3, 27	B/30	6.1-6.3
	4/19	24	6.3	432	6/3, 12, 17 (hints in class for graded problem). Table Climber Status Report #4 due.	6/4	6.4
	4/20				<b>Exam 3: Chapter 5</b>		
13	4/24	25	6.4	444	6/37, 44, 50 (hint for graded problem: in vertical position, $R_t=0$ if impact occurs at the center of percussion)	6/54	6.5
	4/26	26	6.5	461	6/75, 79, 104**	6/80	6.6
	4/27				Table Climber Testing. Table Climber Project Report due.		
14	5/1	27	6.6	479	6/118, 128	6/136	6.8
	5/3	28	6.8	506	6/173, 185, 188	6/182	8.1-8.2
	5/4				<b>Exam 4: Chapter 6</b>		
15	5/8	29	8.2	611	8/ 3, 5, 43	8/4	8.3
	5/10	30	8.3	629	8/ 48, 51	8/52	
	5/11				(In class work)		
F	5/15				-----		
	5/17				<b>Final Exam (11:00 AM - 1:00 PM)</b>		
	5/18				----- Commencement		

**Final, Thursday 5/17/2012, 11:00 AM – 1:00 PM (Chapter 6 & Chapter 8)**\*\* Harder problems that will add to your understanding – do **not** have to be completed, but should at least be attempted.

Note: This syllabus is a guideline for how the course will be conducted. Changes to the syllabus will be kept to a minimum. However, the instructor may make changes as necessary.