### For Transfer to Cal Poly San Luis Obispo or other CSU

<u>Note</u>: While these instructions are designed for Cal Poly transfers, a student going to another CSU should be able to get the Curriculum List, perhaps the Flow Chart and other pertinent information, from that CSU's web site.

#### The steps of this project are:

- □ 1. Obtain an **SEP** from an AHC Counselor.
- □ 2. Visit **www.assist.org** for **articulation agreements** with your university.
- Get the Curriculum List (list of required courses and G.E. Areas) and Course Flow Chart for your major.
- □ 4. Get your major's General Education Requirements.
- □ 5. Get your major's **Transfer Selection** Criteria.
- □ 6. Verify SEP and assist.org course info using the AHC Coursework tables on *Page 9*.
- □ 7. Schedule the rest of your time at AHC (*Page 11*).
- □ 8. Turn in the required packet listed at right.

If you are transferring within a year's time, or are in high school, see me for modified instructions for this assignment.

### WHAT TO TURN IN

- □ 0. **Tues. 10/16**: <u>Copy of your SEP</u> (the counselorgenerated list of courses for your major)
- The day the project is due: STAPLED & IN ORDER:
  - □ a. **PAGE 9:** AHC Coursework Tables (Step 6).
  - □ b. PAGE 11: MY SCHEDULE (Step 7) that YOU filled out (do not turn in a schedule a counselor may have created; make your own schedule so you have ownership of it by physically writing it down).
  - $\Box$  c. <u>a copy of your SEP</u> (*Step 1*).
  - □ d. assist.org printout: ARTICULATIONS AGREEMENT for your major (Step 2).
  - □ e. <u>Cal Poly web site printouts</u>: CURRICULUM LIST and COURSE FLOW CHART for your major (Step 3).
    - ... if not Cal Poly, there should be equivalent pages on <u>your university's</u> web site.

Keep copies of *Page 9*, *Page 11* and your *SEP* for reference while I have your packet.

**<u>Do not</u> turn in** *Pages* **1–8** of this packet; keep them for your reference.

### Complete the Following Eight Steps:

# **1. Student Education Plan (SEP)**

If you do not have an SEP – or if your SEP is over a year old – or it is for a major/university you are no longer planning on – make an appointment with Angelica Enriquez in the STEM Center (in W-22), Christine Reed in the MESA Center (W-21), Ashley Brackett at the University Transfer Center (A-205), or with a counselor at the Counseling Center (Building A) to plan out the courses that you will take at AHC. The course requirements for engineering and science majors are different than for most majors, so ask for a counselor that works with *engineering students* (or *your major*).

During your appointment(s), you and your counselor should generate an SEP.

### <u>Make a copy of your SEP to turn in</u>. Keep a copy for yourself.

# 2. Web Site: www.assist.org

**Go to the web site:** <u>www.assist.org</u>. Assist lists *articulation agreements* between California Community Colleges and California public universities. *Articulation* means how a course at one school counts for credit at another school. For example, ENGR152 (Statics) at AHC counts as ME211 at Cal Poly or ME14 at UCSB.

In the <u>**Transfer Information**</u> window (Figure 1), select:

- 1. Academic Year: ... the latest year
- 2. Institution: .....Allan Hancock College
- 3. Agreements with Other Institutions:

To: California Polytechnic University, San Luis Obispo

or your CSU

### Select View Agreements

On the next page (Figure 2), making sure you <u>View</u> <u>Agreement by</u> Major, select:

Aerospace Engineering, B.S. or <u>your</u> major;

Transfer Information	
Academic Year	?
2019-2020	-
Institution	?
Select an Institution	-
Agreements with Other Institutions	?
Select an Institution	-
View Agreements	
<b>Looking for transferability lists?</b> Select a community college.	

Figure 1 Transfer Information window.

Note: The University/Major on your SEP and the University/Major on Assist should match, otherwise the work done later will not make sense.

2016-2017 to California Polytechnic University, San from Allan Hancock College	Agreement by Major
View Agreement by:	Aerospace Engineering, B.S.
Q Search	To: California Polytechnic University, San Luis Obispo   From: Allan Hancock College ACADEMIC YEAR 2016-2017
III All Majors	View Agreement Download Agreement
A 💿 Aerospace Engineering, B.S. 🔉	* For UC campus and major information not currently available, visit the
O Agricultural & Environmental Plant Sciences, B.S.	* For CSU campus and major information not currently available, visit the CSU Updates website.
O Agricultural Business, B.S.	
O Agricultural Communications, B.S.	ASSIST does not take the place of a counselor on your campus. It is intended to help students and counselors work together to establish an appropriate path toward transferring from a public California community
O Agricultural Science, B.S.	college to a public California university.

Select **View Agreement** (Figure 2). This will open up a PDF of the *articulation agreement* between Allan Hancock College and Cal Poly (or your transfer university), for your major. The *articulation agreement* lists the AHC courses that are equivalent to the university courses.

### Print out the articulation agreement for your major/university.

#### assist.org is only a start...

- you need to look at the current university catalog and consult your Engineering Instructor and/or a counselor for details.
- University curriculum is always changing, and **assist.org** is not always up-to-date.
- The AHC Engineering professor attempts to keep current by attending meetings every semester, communicating directly with university staff, and checking other sources. However, you should always double-check with university sources.

# **3.** Curriculum List; Flowchart

Get the CURRICULUM LIST for your major:

**a.** Go to the Cal Poly catalog web site:

http://catalog.calpoly.edu/

**b.** Select the following link at the top of the page:

### **Degree Flowcharts**

- **c.** Select your *Catalog Year* (for the year you started college, or you may choose a later catalog) from the pull-down menu.
- **d.** Select your *Major* (e.g., Mechanical Engineering) and *Concentration* (if applicable). The *Flowchart* and *Curriculum Sheet* buttons should appear:

Degree Flowcharts and Curriculum Sheets				
Catalog Year	2017 - 20	019 🔽		
Major	Mechanic	cal Engineering	~	
Concentration or Option General			~	
Flowchart Transfer Flowchart Curriculum Sheet				
Flowcharts marked (*) are for unofficial emphasis or track options.				
Figure 3 Flowchart and Curriculum Sheet for 2017-2019. Use the most recent catalog year available.				

The *Flowchart* plots out the courses a student would take during the ideal four-year course of study at the university. The *Flowcharts* generally include not only the term each course should be taken in, but the pre-requisites for each course.

The *Curriculum Sheet* (*Curriculum List*) is a list of the MAJOR COURSES, SUPPORT COURSES and G.E. AREAS – along with their **unit values** – that you must satisfy to graduate. The order that this courses are taken in are not provided.

- e. Select the **Flow Chart** (a .pdf file should open).
- f. Select the Curriculum Sheet (a .pdf file should open).

### Print out the Flow Chart for your major.

### Print out the Curriculum Sheet (list of courses) for your major.

### Note:

Most departments at Cal Poly have a *course flow chart* – the order in which to take the courses – for the ideal 4year schedule. The curriculum sheets and course flow charts for Cal Poly Engineering disciplines can be also found at the College of Engineering's (COE) Advising Center web site. For other STEM majors, the flow charts are at the College of Science and Mathematics (CSM) Center site, and at the College of Architecture and Environmental Design (CAED) Advising Center site:

- COE Advising Center: <u>http://eadvise.calpoly.edu/</u>
- CSM Advising Center: <u>http://www.csmadvising.calpoly.edu/</u>
- CAED Advising Center: <u>http://www.caed.calpoly.edu/content/current/caed-advising</u>

For COE and CSM, the Curriculum Sheets and Flow Charts are under the <u>Majors</u> link. For CAED, the major links are at the bottom right "Department Advising" links.

# 4. General Education

Your G.E. courses at AHC should be listed on your SEP.

<u>WARNING</u>: The G.E. curriculum <u>IGETC</u> and other standard G.E. patterns are NOT appropriate for most engineering majors. CHECK the G.E. requirements for <u>your</u> major at your transfer institution. If you are an engineering major and have been told that you must complete IGETC or another general G.E. pattern, get a second opinion ASAP.

Engineers do not take as many G.E. courses as other majors. Completing your STEM (Science, Technology, Engineering and Math) courses at AHC is of primary concern. You would be too far behind in STEM courses if universities allowed you to transfer without sufficient STEM preparation. In short, if all you do is complete your G.E.'s, you will **not** get into an engineering major.

In addition, engineering colleges generally want you to take G.E.'s during your time at the 4-yr school to help bring balance to a schedule otherwise filled with engineering courses.

Again, it is NOT necessary for engineers to become "G.E.-certified" by completing IGETC, etc. However, if your schedule is such that you will be here for 3 or more years, and you can fit the courses into your schedule, it would not hurt to spend the time to become "G.E.-certified." You never know if your plans will change, and you will be better educated.

Watch your unit count, especially in terms of financial aid, etc.

### To investigate your GENERAL EDUCATION (G.E.) REQUIREMENTS:

**a.** Go to the Cal Poly General Education Program site:

### http://www.ge.calpoly.edu/

- **b.** Investigate the following links:
  - Program Overview
  - Program Requirements & Courses

Note that different majors have different G.E. Requirements.

**c.** A list of Cal Poly courses that satisfy each G.E. Area (Areas A–F) is can be retrieved from the GE Education Program page by following the

### • Program Requirements & Courses link

and then selecting the course/description link to the **2017-19 online catalog** (or LATEST catalog)



*Figure 4* General Education links.

<u>Or</u>, from the Online Catalog's front page (<u>http://catalog.calpoly.edu/</u>), from the links at the right side of the page, select General Requirements – Bachelor's Degree, and then select General Education:

# General Requirements – Bachelor's Degree GRADUATION REQUIREMENTS GENERAL EDUCATION USCP CHOICE OF CATALOG



Direct link: http://catalog.calpoly.edu/generalrequirementsbachelorsdegree/

# 4b. G.E. and Transferring.:

All students must take, at minimum, the "Golden Four" G.E. courses TO TRANSFER to a CSU:

G. E. Area A1:	English Composition/Expository Writing
	(Cal Poly: Engl 134; AHC: Engl 101).
G. E. Area A2:	Oral Communication/Speech
	(Cal Poly: SCOM101 or 102; AHC Speech 101).
G. E. Area A3:	Critical Thinking and Writing*.
	(AHC: Engl 103 or Phil 114).
C E Arres D1	Moth (as a 11 as for a straight and a straight a straig

G. E. Area B1: Math (no problem for engineering majors, satisfied by course requirements).

You should also take a few more courses to fill in lower division G.E.'s. Please **confirm with a counselor** that you have the necessary G.E. courses to transfer to Cal Poly SLO, and that they satisfy appropriate areas. Avoid G.E. courses that do not count towards transfer, or that do not count towards Cal Poly graduation (unless the course helps towards your A.A. degree, or you otherwise want to take it). Courses that help you improve your writing skills are always beneficial.

### \*IMPORTANT NOTE about G.E. Area A3:

While there are other courses at AHC that satisfy G.E. A3, it is <u>highly recommended</u> that you take either **Engl 103** or **Phil 114**, since <u>both</u> courses also satisfy admission requirements to the University of California.

# **5. Transfer Selection Criteria**

A summary of items Cal Poly looks for when selecting Transfer Students can be found at:

http://admissions.calpoly.edu/

Select the link at the top......Apply

Then, in the right menu, under Applicants, select: ......**Transfer** 

This will take you to a page with links relevant to transfer students. Select **Selection Criteria** to go to the transfer selection page. Or you may go immediately here:

### http://admissions.calpoly.edu/applicants/transfer/criteria.html

**These are courses that you should plan on completing in order to maximize your chance of being accepted to Cal Poly**. Failing to complete the Transfer Selection Criteria courses – no matter what your grades are – significantly reduces your transfer chances. The set of courses make up the largest part of your transfer "score" to Cal Poly. **Consider "Desired" course as "Required".** 

### Print your major's Selection Criteria for your own reference.

There is no need to turn it in, but it should be used to help decide what courses you should be take at AHC. <u>You should consider "Desired" courses as "Required"</u>.

# 6. AHC Coursework – Verify SEP and ASSIST, Course History

On *Page 9* of this handout, fill out your name, transfer university and major. Complete the Major and Support Course tables using the information from your SEP and your assist.org agreement. Your University and Major for you SEP and assist.org pages must match.

ADD TO or MODIFY the tables to fit your particular major:

- list <u>all</u> courses on assist.org that are offered at AHC (courses that articulate)
- list <u>all</u> 100-level courses given on your SEP.

In the tables, under the appropriate column, indicate (mark) with an "x" the courses that:

- are listed on your assist.org agreement.
- are listed on your SEP.
- you have successfully completed, or are in progress (IP).

Fill in the table of G.E. courses that you are planning to take at AHC to help fulfill Cal Poly's G.E. and writing requirements.

If a course listed in the table is <u>not</u> on your assist.org agreement, leave the table cell (box) blank. Likewise, if it is <u>not</u> on your SEP or you have not taken it, leave the cell blank.

<u>Check the tables</u>. If your SEP and ASSIST columns do not agree, you should figure out what is going on. Did you miss something from the SEP or ASSIST? Is the SEP wrong? Is ASSIST wrong? Are your SEP and ASSIST printout for the same major and university? (every major and university is generally different).

### 7. Schedule the rest of your time at AHC on "MY SCHEDULE"

On *Page 11*, fill in *your* schedule for the rest of your time at AHC.

Refer to **Page 10** for semesters when relevant courses are usually offered, and to **Page 12** for current AHC engineering course descriptions.

Note that some AHC Physics and nearly all AHC Engineering courses are offered only <u>once per year</u> (see bottom of *Page 10*, and bottom of *Page 11*).

# 8.What to Turn In

See upper right of **Page 1**.

Make sure the pages are turned-in *in order*, and *stapled*.

# 9. Feedback and Grading

I will read your AHC Coursework Tables (*Page 9*) to check that you reviewed the SEP and ASSIST pages, that you marked the courses listed on them as specified in *Step 6*, and that you <u>added</u> any AHC courses on ASSIST or 100-level courses from your SEP not already listed on the Coursework Tables.

I will also review your "My Schedule" (*Page 11*) to ensure that you are taking the appropriate courses in the correct order, and are not taking more courses than needed.

### You will be marked off for the following:

- If pages are missing or out of order (see upper right of **Page 1**).
- If you turn in Pages 1–8 of this packet. I do not need it
- If you do not add (write-in) courses to the Tables that are listed on ASSIST.org that articulate between AHC and your university.
- If you do not add (write-in) 100-level courses to the Tables that are listed on your SEP.
- If you do not mark "x" for <u>all</u> courses listed on your ASSIST.org printout
- If you do not mark "x" for <u>all</u> courses listed on your SEP.
- If you do not put sufficient effort into the project (e.g., if I do more work on the tables than you do, etc.)

Please view the SEP Assignment Rubric on the ENGR 100 webpage!

### *AHC Coursework* Major and Support Courses, G.E. Courses **for transfer to Cal Poly** or other **CSU**

The following tables list **AHC courses** usually required for an engineering degree.

Courses marked with an asterisk (\*) are pre-requisite courses that will **not** be listed on **assist.org**, but you must take to get to the advanced courses. They should be on your **SEP** if needed.

*Note: IGETC* and other G.E. curricula are NOT generally appropriate for engineering majors. CHECK the G.E. requirements for your major.

MATH	On ASSIST	On SEP	Completed
MATH 331*	n/a		
141 or 121,131*	n/a		
MATH 123			
MATH 181			
MATH 182			
MATH 183			
MATH 184			

CHEMISTRY	On ASSIST	On SEP	Completed
CHEM 120*	n/a		
CHEM 150			
CHEM 151			

PHYSICS	On ASSIST	On SEP	Completed
PHYS 110*	n/a		
PHYS 161			
PHYS 162			
PHYS 163			

SCIENCE	On ASSIST	On SEP	Completed
BIO 100			
GEOL 100			

ENGINEERING SUPPORT	On ASSIST	On SEP	Completed
MT 109			
WLD 106			

Name		
Transfer University	Major	

### **INSTRUCTIONS:**

For your particular case, <u>ADD TO or MODIFY</u> the tables to include:

- <u>ALL</u> AHC courses on assist.org that articulate.
- <u>ALL</u> AHC 100-level classes listed on your SEP.

In the appropriate columns, place an "x" next to <u>ALL</u> courses that:

- are listed on your assist.org printout.
- are listed on your SEP.

• you have **successfully completed/are in progress**. Otherwise, leave the box blank.

ENGINEERINGOn ASSISTOn SEPCompletedENGR 100ENGR 126ENGR 152ENGR 154ENGR 156\*\*ENGR 161/162ENGR 170/171

\*\*ENGR 156 = CE204/207 at CP.

COMP. SCI.	On ASSIST	On SEP	Completed
CS 111			
CS 112			

### GENERAL EDUCATION, ENGLISH, etc.

List **all** AHC G.E. and English courses (and any other course) that you plan on taking that will help in your transition to the next school.

#### Add courses to the table as needed.

Course	On ASSIST	On SEP	Completed
ENGL 101			
ENGL 103			
PHIL 114			
SPEECH 101			
ENGL 104			

# **AHC Course Offerings by Semester**

The following are courses usually required by **STEM** (Science/Technology/Engineering/Math) majors. The perquisite for each course has been listed, along with the academic terms that they are *typically* offered (**F**: Fall; **S**: Spring; **U**: Summer; and **Y**: Yes; **N**: No; **S**: Sometimes; **A**: As needed).

While the list has been checked, you should **always** *double-check* the current *Allan Hancock College Catalog* and each semester's *Allan Hancock College Schedule of Classes*. If you find an error, please let me know. Thank you.

Матн	Pre-Requisites	F	S	U
MATH 311	MATH 521 or 531	Y	Y	Y
MATH 321	MATH 309 OR MATH 311	Y	Y	Y
MATH 331	MATH 309 or MATH 311	Y	Y	Y
MATH 121	MATH 331	Y	Y	S
MATH 123	MATH 309 OR MATH 331	Y	Y	Y
MATH 131	MATH 331	Y	Y	Y
MATH 141	MATH 331	Y	Y	Y
MATH 181	MATH 141 OR (MATH 121 AND MATH 131)	Y	Y	Y
MATH 182	MATH 181	Y	Y	Ν
MATH 183	MATH 182	Y	Y	Ν
MATH 184	MATH 182	Y	Y	Ν

CHEMISTRY	Pre-Requisites	F	S	U
CHEM 120	MATH 311	Y	Y	Y
<b>CHEM 150</b>	CHEM 120 (or equivalent) AND MATH 331	Y	Y	N
CHEM 151	CHEM 150	Y	Y	Ν
CHEM 180	CHEM 151	Α	Ν	Ν
CHEM 181	CHEM 180	Ν	Α	Ν

PHYSICS	Pre-Requisites	F	S	U
PHYS 110	MATH 121, 141 or 181+	Y	Y	Y
PHYS 141	MATH 141 OR concurrent MATH 121	Y	Ν	N
PHYS 142	PHYS 141	Ν	Y	Ν
PHYS 161	PHYS 110 AND concurrent MATH 182	Y	Y	N
PHYS 162	PHYS 161 and MATH 182	Ν	Y	Ν
PHYS 163	PHYS 161 and MATH 182	Y	Ν	Ν

SCIENCE	Pre-Requisites	F	S	U
BIO 100	Advisory: Elig. for ENGL 101	Y	Y	Y
BIO 150	CHEM 150	Y	Y	Ν
BIO 154	MATH 331 & BIOL 100 or 150	Ν	Y	Ν
BIO 155	BIOL 150	Y	Ν	Ν
<b>GEOL 100</b>	n/a	Y	Y	N

Engineering Support	Pre-Requisites	F	S	U
ET 100	n/a	Y	Y	S
ET 140	ET 100 or equivalent	Y	Y	Ν
ET 145	ET 140	Y	Y	Ν
MT 109	n/a	Y	Y	Ν
WLD 106	n/a	Y	Y	S

Engineering	Pre-Requisites	F	S	U
ENGR 100	Advisory: ENGL 514 OR eligibility for ENGL 101	Y	Y	N
ENGR 124	MATH 181	Y	Ν	Ν
ENGR 126	MATH 181	Ν	Y	Ν
ENGR 152	PHYS 161 AND MATH 182	Y	Ν	Ν
ENGR 154	ENGR 152 AND MATH 182	Ν	Y	Ν
ENGR 156*	ENGR 152	Ν	Y	Ν
ENGR 161/162	PHYS 161 AND CHEM 150	Y	Ν	Ν
ENGR 170/171	PHYS 163 AND MATH 182	N	Y	N

\*ENGR 156 = CE204/207 at CP.

COMPUTER SCI.	Pre-Requisites	F	S	U
CS 111	MATH 331 Advisory: CS 102	Y	Y	Y
CS 112	CS 111	Y	Y	Ν
CS 131	CS 111	Y	Y	Ν
CS 161	MATH 181 AND CS 111	Y	Y	Ν
CS 181	CS 111	Ν	Ν	S

\*Please check current schedule or contact CS faculty.

#### **ENGLISH, SPEECH, GENERAL EDUCATION**

	Pre-Requisites	F	S	U
ENGL 101	ENGL 514 OR START placement	Y	Y	Y
ENGL 103	ENGL 101	Y	Y	Y
ENGL 104	ENGL 101	Ν	Ν	Y
SPEECH 101	n/a	Y	Y	Y
SPEECH 102	n/a	Y	Y	Y
PHIL 114	ENGL 101	Y	Y	Y

	N I v				Name						
		L DCHE	DULE		University	~		Major			
Using your 5 12 of this as by-semester may need to Put it in a pla This is <u>your</u> Make sure 1 Soon-to-be tr your first ter your first ter transfer insti are on track. look at their	SEP and assist signment (or t r plan for the r be modified w tee where you c "Road Map" ft the AHC Engi the AHC Engi AHC Engi the AHC Engi the AHC Engi the AHC E	t.org informati the AHC <i>Catalo</i> rest of your tim ith time, so keej can see it often ( or the next few s neering Profes re out what cour isfer university. v.assist.org, yc r engineering in puirements chang onsult your cou	ion, and Pages g), develop a ne at AHC. Th ne at AHC. Th p it up to date. (your bedroom semesters. Eng sor reviews yo reses you will ta List them. Jur counselor, structor to ens ge, so you shou inselor and inst	<i>s 10</i> and semester- he plan h door?). gineers: our plan. ake during your urre you uld always tructor.	<ul> <li>Hints for ST</li> <li>Take Math Finish Math Rath 181 a Physics and</li> <li>Take Chemi and Physic Their math strict as oth and Physics advanced of improves y(</li> <li>Don't be afr Instructors i help you ge</li> </ul>	<b>EM majors</b> every semester h 181 as soon as and 182 open the l Engineering cc <b>istry, Compute</b> <b>istry, Compu</b>	i possible. e doors to ourses. <b>r Science</b> <b>s possible</b> . e not as Chem 150 quisites for duisites for cience cing skills. help. are here to want to go.	<ul> <li>Take engineer Engr. 124: Ex and Engineeri (drafting and welding WLL These courses and tools to he in internships more you lear you will be, an are to employ.</li> <li>Make sure you G.E./support of Engl 103, Spe</li> </ul>	<b>ing support con</b> <i>ing Technology (</i> CAD in ET100, CAD in ET100, 106; machining elp you succeed and in your care n, the better an 6 nd the more attri ers. fulfill the neces courses (e.g., En ech 101, etc.).	DJD 8/2018 <b>Irrses:</b> <i>Matlab</i> ; courses 140, 145, MT 109). MT 109). th skills in school, eer. The engineer active you sary gl. 101,	
	<u>List</u> classe	s by <u>discipline</u> a	<b>S</b> i and <u>number</u> ; e	CHEDUL.	<b>E BY SE</b> 0; MATH 181;	MESTER PHYS 161; EI	NGR 152. W <sup>ε</sup>	ttch the pre-red	uisites.		
Fall 2019	Spring 2020	Summer 2020	Fall 2020	Spring 2021	Summer 2021	Fall 2021	Spring 2022	Summer 2022	Fall 2022	Spring 2023	
NOTE: C	urrently, the fol courses are off	llowing AHC P ered <u>once per y</u>	Physics and En <u>vear</u> .	ıgineering {	FALL ONI	LY ENGI	R 124; 152; 161	&162 PI	HYS 141; 163		
				•	O DVINIO O	INTI : FINCE	K 120; 124; 130	; T/U&T/T FI	1X3 142; 102		

Page 11 of 12

#### **ENGR 100** – Introduction to Engineering

(1 unit) – **Fall, Spring** | *Advisory*: Concurrent enrollment in ENGL 514 or eligibility for ENGL 101.

This course provides an overview of the engineering profession and educational path in order for students to evaluate engineering as a career choice. The course is also applicable for science, mathematics and architecture majors. The engineering branches are introduced, along with their relationships to science and other fields of study. The education process and strategies for engineering and science students to reach their full academic potential are explored. Course topics include professional duties, responsibilities, employment opportunities, the engineering design process and problem solving. Students will develop a study plan and research technical topics. Guest speakers include working engineers and university representatives.

GR/P/NP (Grade or Pass/Not Pass). CSU, UC unit credit. *Note*: This course is not a transfer requirement, but is meant as an intro to engineering education and the engineering profession. It articulates to some universities and to some majors.

#### **ENGR 152** – Statics

(3 units) – Fall | *Pre-req.: Math 182* and (*Phys 161* or 141). A first course in engineering mechanics: properties of forces, moments, couples and resultants; two- and three-dimensional force systems acting on engineering structures in equilibrium; analysis of trusses, and beams; distributed forces, shear and bending moment diagrams, center of gravity, centroids, friction, and area and mass moments of inertia. Optional additional topics include fluid statics, cables, Mohr's circle and virtual work.

GR (Grade). CSU, UC unit credit. C-ID ENGR 130.

#### ENGR 154 – Dynamics

(3 units) – **Spring** | *Pre-req.: Engr. 152* and *Math 182*. Fundamentals of kinematics and kinetics of particles and rigid bodies. Topics include kinematics of particle motion; Newton's second law, work-energy and momentum methods; kinematics of planar motions of rigid bodies; work-energy and momentum principles for rigid body motion; Introduction to mechanical vibrations (optional).

GR. CSU, UC unit credit. C-ID ENGR 230

#### **ENGR 156** – Strength of Materials

(4 units) – **Spring** | *Pre-req.: Engr.* 152.

This course is a study of stresses, strains and deformations associated with axial, torsional and flexural loading of bars, shafts and beams, as well as pressure loading of thin-walled pressure vessels. The course also covers stress and strain transformation, Mohr's Circle, ductile and brittle failure theories, and the buckling of columns. Statically indeterminate systems are also studied. GR. CSU, UC unit credit. C-ID ENGR 240.

#### **ENGR 161** – *Materials Science*

(3 units) – **Fall** | *Pre-req.: Phys. 161* and *Chem. 150.* This course presents the internal structures and resulting behaviors of materials used in engineering applications, including metals, ceramics, polymers, composites, and semiconductors. The emphasis is upon developing the ability both to select appropriate materials to meet engineering design criteria and to understand the effects of heat, stress, imperfections, and chemical environments upon material properties and performance.

GR. CSU, UC unit credit. C-ID ENGR 140.

#### **ENGR 162** – *Materials Science Lab*

(1 unit) – Fall | Co-req.: Engr 161 (or prior completion). Laboratory to parallel ENGR 161. This course is the experimental exploration of the connections between the structure of materials and materials properties. Laboratories provide opportunities to directly observe the structures and behaviors discussed in the lecture course (ENGR 161), to operate testing equipment, to analyze experimental data, and to prepare reports. GR. CSU, UC unit credit. C-ID ENGR 140L

### ENGR 170 – Electric Circuit Analysis

(3 units) – **Spring** | *Pre-req.: Math 182* and *Phys 163. Advisory: Concurrent enrollment in Engr 171.* An introduction to the analysis of electrical circuits. Use of analytical techniques based on the application of circuit laws and network theorems. Analysis of DC and AC circuits containing resistors, capacitors, inductors, dependent sources, operational amplifiers, and/or switches. Natural and forced responses of first and second order RLC circuits; the use of phasors; AC power calculations; power transfer; and energy concepts. Most engineering majors are required to complete the associated course (ENGR 171); the laboratory course should be taken concurrently. GR. CSU, UC unit credit. C-ID ENGR 260.

#### ENGR 171 – Electric Circuit Lab

(1 unit) - Spring | Pre-req.: Math 182 and Phys 163.

Advisory: Concurrent enrollment in Engr 170. An introduction to the construction and measurement of electrical circuits. Basic use of electrical test and measurement instruments including multimeters, oscilloscopes, power supplies, and function generators. Use of circuit simulation software. Interpretation of measured and simulated data based on principles of circuit analysis for DC, transient, and sinusoidal steady-state (AC) conditions. Elementary circuit design. Practical considerations such as component value tolerance and non-ideal aspects of laboratory instruments. Construction and measurement of basic operational amplifier circuits. The associated lecture course (ENGR 170) should be taken concurrently.

GR. CSU, UC unit credit. C-ID ENGR 260L

#### Short-courses

### **ENGR 124** – Excel for Science & Engineering

(1 unit) – **Fall** | Pre-req.: Math 181. An introduction to Excel as used in science and engineering.

Students use math operations, functions, statistics and graphs to analyze and display data and to differentiate and integrate. Basic application problems are solved.

P/NP. CSU unit credit.

#### ENGR 126 – MATLAB for Science & Engineering

(1 unit) - Spring | Pre-req.: Math 181.

An introduction to Matlab as used in science and engineering. Students create and manipulate matrices, program script, and m-files; generate 2-d and 3-d plots; and solve ODEs. Basic application problems are solved.

GR. CSU, UC unit credit.

**Engr 124** and **126** are designed as Lecture/Lab format to allow students to learn these important tools. Prepare for upper-division studies and your future professional work.