

For Transfer to **UC Santa Barbara** or other UC

Note: While these instructions are designed for UCSB transfers, a student going to another UC should be able to get the Curriculum List, the Flow Chart and other pertinent information, from that UC'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.
- ☐ 3. Get the **Curriculum List** (list of required courses and G.E. Areas) and **Course Flow Chart/Term-by-Term Schedule** (if available) for your major.
- ☐ 4. Get your major's **General Education Requirements**.
- ☐ 5. Get the **Transfer Admission Guarantee** for your major.
- ☐ 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, see me for modified instructions for this assignment.

WHAT TO TURN IN

- ☐ 0. **Tuesday, 10/20: Copy of your SEP** (the counselor-made list of courses for your major)

The day the project is due: **Tuesday, 11/03.**

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).
- ☐ c. **a copy of your SEP** (Step 1).
- ☐ d. **assist.org printout: ARTICULATIONS AGREEMENT** for your major (Step 2).
- ☐ e. **UCSB web site printouts:**
CURRICULUM LIST and TRANSFER ADMISSIONS for your major (Steps 3 and 5)
... if not UCSB, they should be equivalent pages on your university's web site.

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

DO NOT 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.

 **Make a copy of your SEP to turn in.** Keep a copy for yourself.

2. Web Site: www.assist.org

Go to the web site: www.assist.org. 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 **Transfer Information** window (Figure 1), select:

1. Academic Year: ...***the latest year***
2. Institution:**Allan Hancock College**
3. Agreements with Other Institutions:
**To: University of California,
Santa Barbara**
or your UC

Select **View Agreements**

On the next page (Figure 2), making sure you **View Agreement by Major**, select:

Electrical Engineering, B.S.
or **your major**;

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

Figure 1 Transfer Information window.

Figure 2 www.assist.org Articulation Agreement selection page

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

Each major at a university has a *Curriculum List*. The *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.

Each major – especially in STEM fields – generally has a *Flowchart* or *Term-by-Term Schedule* that plots out the courses a student would take during the ideal four-year course of study at the university.

Engineering and Computer Science majors should look at UCSB's College of Engineering publications (.PDF files) at:

<https://engineering.ucsb.edu/undergraduate/academic-advising/gear-publications>



Figure 3 UCSB College of Engineering GEAR Publications page

The College of Engineering's publication *General Engineering Academic Requirements – GEAR* – has the 4-year curriculum for each major, General Education information, and other info. The direct link to the 2020–21 *GEAR* is:

<https://engineering.ucsb.edu/sites/default/files/docs/20-21%20GEAR%20for%20Web.pdf>

Pages 46–55 of *GEAR* give the *Curriculum List* and *Term-by-Term Schedule* for each of UCSB's Engineering majors. **Download *GEAR* to investigate details of your major, courses, etc.**

 **Print out the Curriculum List (list of courses) for your major.**

 **Print out the Flow Chart/Term-by-Term Schedule for your major.**

For other UCSB STEM Majors:

- a. Go to UCSB's online catalog:

<http://my.sa.ucsb.edu/catalog/Current/>

- b. Search the Catalog for your major in the undergraduate Major Director link in the left menu,
Or a list of all majors is: <https://my.sa.ucsb.edu/catalog/Current/UndergraduateDegreeList.aspx>

- c. Visit the Online Catalog's Department web site for your major.

- d. Find the **Curriculum List for your major** – likely under the **Undergraduate Program** tab. On the Undergraduate Program tab, select the PDF of the requirements for your major.

Bachelor of Science – *name of major* (Requirements – PDF)

- e. Download the Requirements .pdf.
- f. Often the Requirements just give Course Numbers. You should research the catalog further to see exactly what the courses are part of your program. Investigate the details of the courses in the **Course** tab.
- g. Find the **Flowchart/Term-by-Term Schedule** (if it exists) and print it.
You might find it on the Department's regular website.
- h. Visit the regular Department web site for your major.

 **Print out the Curriculum List (list of courses) for your major.**

 **Print out the Flow Chart for your major (if available).**

e.g., for **Biological Sciences** (see next page for image)

- b. Search UCSB's online catalog for **Biology (Biological Sciences)**
- c. The Online Catalog department link for: **Molecular, Cellular and Developmental Biology**:
<http://my.sa.ucsb.edu/catalog/Current/CollegesDepartments/ls-intro/mcdb.aspx>

- d. Select the **Undergraduate Program** tab (Figure 4) and download the **Curriculum List** for Biological Science from the link:

Bachelor of Science—Biological Sciences (Requirements - PDF)

Direct Link:

<https://my.sa.ucsb.edu/catalog/Current/CollegesDepartments/ls-intro/mcdb.aspx?DeptTab=Undergraduate>

.... KEEP LEARNING ABOUT YOUR MAJOR.

UNIVERSITY OF CALIFORNIA, SANTA BARBARA
GENERAL CATALOG 2020-2021

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RESEARCH AT UCSB
ACADEMIC POLICIES AND PROCEDURES

Colleges and Departments > College of Letters and Science > Academic Departments > Molecular, Cellular, and Developmental Biology

Molecular, Cellular, and Developmental Biology

Division of Mathematical, Life, and Physical Sciences
Life Sciences & Technology Building, Rm. 3308
Telephone: (805) 893-3512
Undergraduate Information (805) 893-5191
Graduate Information (805) 893-8499
Undergraduate e-mail: mcdb-ugrad@lifesci.ucsb.edu
Graduate e-mail: mcdb-gradadv@lifesci.ucsb.edu
Website: lifesci.ucsb.edu/MCDB
Department Chair: Stephen J. Poole

Overview Faculty Undergraduate Program Graduate Program Courses Learning Outcomes

Overview

The Department of Molecular, Cellular, and Developmental Biology (MCDB) offers the bachelor of science degree in four departmental majors—biochemistry-molecular biology, cell and developmental biology, microbiology, and pharmacology. In

Figure 4 UCSB online catalog page for Molecular, Cellular and Developmental Biology.

For those looking at other University of California Campuses and Majors:

- Search the online catalog for your UC/major.
- Visit the Department web site for your major.
- **Get the Curriculum List and Term-by-Term Schedule/Flow Chart** (if the Schedule or Flow Chart is available for your major).

In other words, follow the same general guidelines to the get the needed information.

Regardless of your major, for STEP 3:

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

Print out the Flow Chart for your major (if available).

4. General Education

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

WARNING: The G.E. curriculum *IGETC* and other standard G.E. patterns are NOT appropriate for most engineering majors. CHECK the G.E. requirements for your 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 General Education Requirements

Go back to assist.org and select Allan Hancock College/UCSB (or your UC). Under View Agreements by (Figure 5), select:

General Education / Breadth Agreements

Then select:

College of Engineering General Education Requirements

Or, if not an engineering or computer science major:

General Education / Breadth

Select **View Agreement** to see the GE agreement.

 **Print out the General Ed. Requirements.**

For entrance into the University of California, you must take at least **two English composition courses** at AHC. Acceptable AHC courses are **Engl 101 and one of the following**: Engl 102, Engl 103 or Phil 114.

Engineers must also take four more G.E. courses. See the AHC G.E. courses you can take at **assist.org**.

Please **confirm with a counselor** that you have the necessary G.E. courses to transfer to UCSB, and that they satisfy appropriate areas. Avoid G.E. courses that do not count towards transfer, or that do not count towards UC 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.

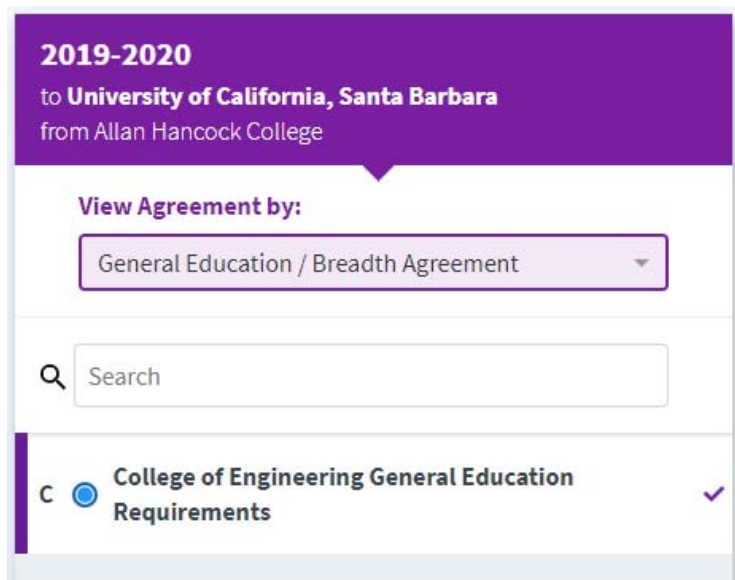


Figure 5 General Education selection.

5. Transfer Eligibility and Selection

STEM majors at UCSB (and other UC's) are impacted, so taking the right courses is important. The UCSB Admissions Answer page for transfers is:

<http://admissions.sa.ucsb.edu/applying/transfer>

The UCSB page for **Selective Majors for Transfer** is:

<http://admissions.sa.ucsb.edu/applying/transfer/selective-majors>

The *Transfer Admission Guarantee* **NO LONGER** applies for UCSB Engineering majors.

<http://www.admissions.ucsb.edu/TAGInfo.asp>

There is a *Transfer Admission Planner* (TAP) to help track your transfer progress.

<https://uctap.universityofcalifornia.edu/students/>

 **Print out or bookmark any pertinent UCSB transfer site.**

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 all courses on assist.org that are offered at AHC (courses that articulate)
- list all 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 not on your assist.org agreement, leave the table cell (box) blank. Likewise, if it is not on your SEP or you have not taken it, leave the cell blank.

Check the tables. 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 once per year (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 added 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 all courses listed on your ASSIST.org printout
- If you do not mark “x” for all 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 UC Santa Barbara / UC

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

ENGINEERING SUPPORT	On ASSIST	On SEP	Completed

Name:	
University	Major

INSTRUCTIONS:

For your particular case, **ADD TO or MODIFY the tables to include:**

- **ALL** AHC courses on **assist.org** that articulate.
- **ALL** AHC 100-level classes listed on your **SEP**.

In the appropriate columns, place an “x” next to ALL 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.

ENGINEERING	On ASSIST	On SEP	Completed
ENGR 100			
ENGR 126 [†]			
ENGR 152			
ENGR 154			
ENGR 156			
ENGR 161/162			
ENGR 170/171			

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

[†] AHC's ENGR126 currently articulates directly with UCSB's ENGR3 (Intro to Programming).

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 course to the table as needed.

GENERAL EDUCATION	On ASSIST	On SEP	Completed
ENGL 101			
ENGL 103			
PHIL 114			

AHC Course Offerings by Semester

DJD 7/2020

The following are courses usually required by **STEM** (Science/Technology/Engineering/Math) majors. The prerequisite 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.

MATH	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	N
MATH 183	MATH 182	Y	Y	N
MATH 184	MATH 182	Y	Y	N

CHEMISTRY	Pre-Requisites	F	S	U
CHEM 120	MATH 311	Y	Y	Y
CHEM 150	CHEM 120 (or equivalent) AND MATH 331	Y	Y	N
CHEM 151	CHEM 150	Y	Y	N
CHEM 180	CHEM 151	Y	N	N
CHEM 181	CHEM 180	N	Y	N

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

SCIENCE	Pre-Requisites	F	S	U
BIO 100	Advisory: Elig. for ENGL 101	Y	Y	Y
BIO 150	CHEM 150	Y	Y	N
BIO 154	MATH 331 & BIOL 100 OR 150	N	Y	N
BIO 155	BIOL 150	Y	N	N
GEOL 100	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	N
ET 145	ET 140	Y	Y	N
MT 109	n/a	Y	Y	N
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	N	N
ENGR 126	MATH 181	N	Y	N
ENGR 152	PHYS 161 AND MATH 182	Y	N	N
ENGR 154	ENGR 152 AND MATH 182	N	Y	N
ENGR 156*	ENGR 152	N	Y	N
ENGR 161/162	PHYS 161 AND CHEM 150	Y	N	N
ENGR 170/171	PHYS 163 AND MATH 184 (Math 184 concurrent or before)	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	N
CS 131	CS 111	Y	Y	N
CS 161	CS 111	Y	Y	N
CS 181	CS 111, Advisory: CS 112	N	N	S

*Please check current schedule or contact CS faculty.

ENGLISH, SPEECH, GENERAL EDUCATION

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

<h1>MY SCHEDULE</h1>		Name
		Major
		University

DJD 7/2020

Using your *SEP* and assist.org information, and *Pages 10* and *12* of this assignment (or the *AHC Catalog*), develop a semester-by-semester plan for the rest of your time at AHC. The plan may need to be modified with time, so keep it up to date.

Put it in a place where you can see it often (your bedroom door?). This is your “Road Map” for the next few semesters. **Engineers: Make sure the AHC Engineering Professor reviews your plan.**

Soon-to-be transfers: Figure out what courses you will take during your first terms at your transfer university. List them.

Continue to check with www.assist.org, your counselor, your transfer institution and your engineering instructor to ensure you are on track. University requirements change, so you should always look at their websites and consult your counselor and instructor.

Hints for STEM majors

- **Take Math every semester.**
Finish Math 181 as soon as possible. Math 181 and 182 open the doors to Physics and Engineering courses.
- **Take Chemistry, Computer Science and Physics 110 as soon as possible.**
Their math requirements are not as strict as other courses, and Chem 150 and Physics 110 are pre-requisites for advanced courses. Comp. Science improves your logical thinking skills.
- **Don't be afraid to ask for help.**
Instructors and counselors are here to help you get to where you want to go.
- **Take engineering support courses:**
Engr. 124: Excel; Engr. 126: Matlab; and Engineering Technology courses (drafting and CAD in ET100,140, 145, welding WLD106; machining MT109). These courses provide you with skills and tools to help you succeed in school, in internships and in your career. The more you learn, the better an engineer you will be, and the more attractive you are to employers.
- Make sure you fulfill the necessary G.E./support courses (e.g., Engl. 101, Engl 103, Speech 101, etc.).

SCHEDULE BY SEMESTER

List classes by discipline and number; e.g., CHEM 150; MATH 181; PHYS 161; ENGR 152. Watch the pre-requisites.

Fall 2020	Spring 2021	Summer 2021	Fall 2021	Spring 2022	Summer 2022	Fall 2022	Spring 2023	Summer 2023	Fall 2023	Spring 2024

NOTE: Currently, the following AHC Physics and Engineering courses are offered once per year.

FALL ONLY ENGR 124; 152; 161&162 PHYS 141; 163
SPRING ONLY .. ENGR 126; 154; 156; 170&171 PHYS 142; 162

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 184* 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.

* Please fill out a pre-requisite appeal for Math 184 ([only](#) Math 184). Math 184 concurrent is OK.

ENGR 171 – Electric Circuit Lab

(1 unit) – **Spring** | *Pre-req.:* Math 184* 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

* Please fill out a pre-requisite appeal for Math 184 ([only](#) Math 184). Math 184 concurrent is OK.

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.