

Career Planning Guide Effective April 2006 for

Bioengineering and Chemical pre-Engineering Pathway

Length of Program: 100 - 102 credits

Goal: Associate of Science (AS) Degree

Official Designation: AS-T Bio/Chem E/MRP. Exit Code of O and CIP of 14.0701

South Seattle Community College

6000 16th Ave SW

Seattle, Washington 98106-1499

<http://www.southseattle.edu/>

Academic Offices (206) 768-6600

General Academic Advising:

(206)-764-5387

advisorsouth@sccd.ctc.edu

Quarterly Costs – check current schedule:

<http://www.southseattle.edu/services/tuition.htm>

Class schedule and District catalog:

<http://www.southseattle.edu/programs/classCat/>

Engineering Faculty Contact:

Mike Steffancin (206)-768-6486

msteffancin@sccd.ctc.edu

RSB 189

PROGRAM DESCRIPTION

Bioengineers are concerned with the application of engineering sciences, methods, and techniques to problems in medicine and biology. Bioengineering encompasses two closely related fields of interest: the application of engineering sciences to understand how animals and plants function; and the application of engineering technologies to design and develop new devices, including diagnostic or therapeutic instrumentation, or the formulation of synthetic biomaterials, the design of artificial tissues and organs, and the development of new drug delivery systems. Chemical engineers are concerned with transforming raw materials into useful products, such as gasoline, pulp and paper, pharmaceuticals, and energy. Environmental processes, such as waste disposal and recycling, are other areas of increasing interest. The Bioengineering and Chemical Engineering Pathway Associate of Science (AS) degree program prepares students for transfer to Bioengineering and Chemical Engineering programs at four-year colleges and universities and will give students basic skills needed by all engineers. The curriculum also develops other job related skills such as communications, human relations and technical report writing. Credits earned with the AS degree at South Seattle Community College can be applied toward the first two years of a four-year bachelor's degree in engineering.

PROGRAM OUTCOMES

Students who successfully complete this program will show:

- An ability to apply knowledge of mathematics and scientific principles to engineering problems.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to think critically in evaluating information, solving problems and making decisions.
- An ability to function on diverse, multi-disciplinary teams.
- An ability to access and evaluate information from a variety of sources including the Internet.
- An understanding of professional and ethical responsibility.
- An ability to communicate effectively with written, oral, and visual means.
- The broad education necessary to understand the impact of engineering solutions in a global and societal context.
- A recognition of the need for and an ability to engage in life-long learning.
- An ability to use modern engineering techniques, skills, and technology including computing and programming tools necessary for engineering practice.

CAREER OPPORTUNITIES

The employment outlook for Engineers is very good. Graduates can be employed in private industry as well as various governmental departments, consulting services, and technical sales. Nationwide, the average starting salary for graduates with a Bachelor's degree in Engineering in 2008 varies from \$50,940 to \$63,616 depending on the field studied. Source: National Association of Colleges and Employers.

Associate of Science

Bioengineering and Chemical pre-Engineering Pathway

CURRICULUM

100 - 102 credits are required for the AS degree. All classes are 5 credits unless otherwise listed.

BASIC REQUIREMENTS (20 credits):

- ENGL& 101 – Composition
- MATH& 151 – Calculus I
- MATH& 152 – Calculus II
- MATH& 153 – Calculus III

DISTRIBUTION REQUIREMENTS (15 credits):

A course in Economics is recommended.

Visual, Literary and Performing Arts (5 - 10 credits)

- Language and Speech
- Literature/History of Ideas
- Music, Art and Drama

Individuals, Cultures and Societies (5 - 10 credits)

- Individuals and Societies
- United States Culture
- Global Studies

MAJOR AREA OF STUDY (55 - 57 credits):

- CHEM& 161[†], 162, 163 (6 cr. each)
- CHEM& 241 (4 cr), CHEM& 251 (3 cr)
- BIOL& 211 or CHEM& 242 (4cr) + CHEM& 252 (3 cr)
- CSC 142[‡] (or ENGR 142[‡])
- MATH 238
- PHYS& 221, 222, & 223

ELECTIVES (10 credits):

Courses may not be used to satisfy other requirements. Choose two from the list below.

Selection should be made based on advisor recommendation, given the branch of engineering that the student plans to pursue.

BIOL& 211 College Biology I
 BIOL& 212 College Biology II
 CHEM& 242 (4 cr) + CHEM& 252 (3 cr) Organic Chem. II + lab
 ENGR& 204 Fundamentals of Electrical Engineering
 ENGR& 230 Technical Writing (3 cr)
 ENGR& 224 Thermodynamics
 MATH 220 Linear Algebra
 MATH 224 Vector Calculus

Footnotes:

[†]CHEM139 is a prerequisite for CHEM& 161

[‡]CSC 110 is a prerequisite for CSC/ENGR 142

SAMPLE COURSE PLAN

By starting in the Fall and taking a full-time load, students may complete the curriculum in six quarters, though many students find they need to take summer classes. Certain higher-level classes are only offered once a year, **so be sure to consult with advisors here at SSCC and at the 4-year institution you will attend to plan your schedule.**

FRESHMAN YEAR:

First quarter

- MATH& 151 Calculus I
- ENGL& 101 Composition
- CHEM& 161 Chemistry I

Second quarter

- MATH& 152 Calculus II
- CSC 142 Computer Programming for Engineers
- CHEM& 162 Chemistry II

Third quarter

- CHEM& 163 Chemistry III
- MATH& 153 Calculus III
- PHYS& 221 Engineering Physics I

SOPHOMORE YEAR:

First quarter

- Distribution Requirement (5 credits)
- CHEM& 241 + CHEM& 251 Organic Chemistry + lab (7 cr)
- PHYS& 222 Engineering Physics II

Second quarter

- Distribution Requirement (5 cr)
- BIOL& 211 College Biology
- ENGR& 204 Fund. of Electrical Engineering
- PHYS& 223 Engineering Physics III

Third quarter

- Distribution Requirement (5 cr)
- BIOL& 212 College Biology II
- ENGR& 230 Technical Writing
- MATH& 238 Differential Equations



ASSOCIATE OF SCIENCE DEGREE IN BIOENGINEERING AND CHEMICAL ENGINEERING

Note: Students must have a minimum 2.0 GPA for graduation and must take a minimum of 30 credits at SSSC. Final quarter must be at SSSC.

Name	SID#				
No course fulfills more than one requirement Basic Requirements: 20 credits	Course Credit	Credit Earned	Grade	College	Quarter
ENGL& 101	5				
MATH& 151	5				
MATH& 152	5				
MATH& 153	5				
Areas of Knowledge Distribution Requirements: 15 credits					
Visual, Literary, and Performing Arts (Humanities and Arts): 5 – 10 credits					
Individuals, Cultures, and Society (Social Sciences): 5 – 10 credits					
Major Area of Study: 55 - 57 credits					
CHEM&161	6				
CHEM&162	6				
CHEM&163	6				
CHEM& 241	4				
CHEM& 251	3				
BIOL& 211 (5 cr) or CHEM& 242 (4 cr) + CHEM& 252 (3 cr)	5 - 7				
CSC 142 or EGR 142	5				
MATH 238	5				
PHYS& 221	5				
PHYS& 222	5				
PHYS& 223	5				
Electives: 10 credits Choose two classes from the list.					
Courses may not be used to satisfy other requirements. Selection should be made based on advisor recommendation, given the four-year institution that the student plans to attend.					
BIOL& 211 College Biology I	5				
BIOL& 212 College Biology II	5				
CHEM& 242 + CHEM& 252 Organic Chemistry + lab	7				
ENGR& 230 Technical Writing	5				
ENGR& 224 Thermodynamics	5				
ENGR& 204 Fundamentals of Electrical Engineering	5				
MATH 220 Linear Algebra	5				
MATH 224 Vector Calculus	5				

Total Credits Required: 100 - 102

Evaluator _____

Date _____