PHYSICAL SCIENCES DEPARTMENT

101 Science Bldg.
(435) 652-7760
http://dixie.edu/science/

To find faculty & staff phone numbers and email addresses, please consult the College Directory http://www.dixie.edu/directory/directory.php.

Department Chair
Pete VanValkenburg

Department Secretary
Kathi Steadward

Faculty

Professor
Dr. David Feller (Chemistry)
Dr. Victor Hasfurther (Engineering)

Associate Professor
Kelly Bringhurst (Geology)
Dr. Robert Cowan (Chemistry)
Dr. Jerry Harris (Geology)
Steve Sullivan (Physics)
Pete VanValkenburg (Geology)

Assistant Professor
Dr. Rico Del Sesto (Chemistry)

Course Prefixes

• CHEM, ENGR, GEO, GEOG, PHYS, SCI

Degrees & Certificates

• Bachelor of Science in Physical Science Composite Teaching (Secondary Education)
• Associate of Pre-Engineering (APE)
• Associate of Applied Science in General Technology

Physical Sciences Program Description

The Dixie State College Physical Sciences department offers a variety of courses in Chemistry, Engineering, Geology, Geography, and Physics that allows students to better understand and appreciate the natural world and our place in it. Many of these courses fulfill the General Education Physical Science requirement for all students. Coursework in the Physical Sciences also fulfills prerequisites and requirements for students planning to pursue careers in medicine, dentistry, pharmacy, optometry, engineering, chiropractics, physical therapy, physician’s assistant, veterinary medicine, nursing, dental hygiene and other fields.

Bachelor of Science in Physical Science

The Bachelor of Science in Physical Science Composite Teaching with Secondary Education Licensure prepares students for careers in secondary education. Graduates will be qualified to teach Chemistry and Physics. One additional Biology course and lab (BIOL 2220/25 General Ecology / Lab) would add an Earth Science endorsement to a graduate’s portfolio.

Pre-Engineering Program Description

Pre-Engineering is a 70 credit degree program that prepares a student to complete the first two years of most bachelor’s degree programs in engineering (e.g. Aerospace, Architectural, Biomedical, Chemical, Civil, Computer, Electrical, Environmental, Industrial, Mechanical, Petroleum, etc). With appropriate planning, Pre-Engineering coursework completed at DSC will transfer to all the Utah universities and most other universities with 4-year engineering degree programs. Each field of engineering requires different coursework. However, the first two years are similar in the courses required. Usually, the transfer student will need to take two or three courses not available at Dixie State College, but these are not pre-requisites to the last two years of most engineering programs. The student will have fulfilled his General Education requirements and thus will be on schedule for the last two years upon transfer.

Engineering is an exciting major in terms of professional career opportunities, job satisfaction, and compensation. The first two years of all engineering programs are filled with challenging Mathematics, Physics, Chemistry, and Engineering courses. Dixie State College is a great place to take your first two years because of its small class size, caring and knowledgeable professors, and a positive, friendly atmosphere.

Bachelor of Science in Physical Science Composite Teaching

Secondary Education Licensure

122 credits

The Bachelor of Science in Physical Science Composite Teaching degree has five basic components:

1. General Education and Institutional requirements (some may be included in program requirements)
2. Physical Science Core requirements
3. Math and Science Core requirements
4. Computer Science Elective requirements
5. Math and Science Elective requirements

Institutional Requirement in Computer Literacy

Complete one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 1200</td>
<td>Computer Literacy</td>
<td>3</td>
</tr>
<tr>
<td>CIS 1201</td>
<td>Computer Literacy Exam</td>
<td>0</td>
</tr>
<tr>
<td>CS1400/CS1410</td>
<td>Computer Programming</td>
<td>6</td>
</tr>
</tbody>
</table>
**General Education Requirements**

Complete the following:

- ENGL 1010 Intro to Writing 3
- ENGL 2010 Intermediate Writing 3

Complete one of the following:

- LIB 1000 Information Literacy Exam 0
- LIB 1010 Information Literacy 1

Complete the following:

- Mathematics GE course 3-5
- Life Sciences GE course 3-5
- Physical Sciences GE course 3-5
- Laboratory Science GE course 0-1
- Fine Arts GE course 3
- Literature/Humanities GE course 3
- Exploration GE course 3-5
- Two (2) Global & Cultural Perspectives GE courses 0-6

Complete one of the following American Institutions GE courses (SET requirement):

- HIST 1700 American Civilization 3
- POLS 1100 American Government 3

Complete one of the following Social & Behavioral Sciences GE courses (SET requirement):

- FCS 1500 Human Development / Lifespan 3
- PSY 1010 General Psychology 3
- PSY 1100 Human Development / Lifespan 3

**Core Requirements**

Complete the following Chemistry requirements:

- CHEM 1210/15 Principles of Chemistry I / Lab 4/1
- CHEM 1220/25 Principles of Chemistry II / Lab 4/1

Complete one of the following:

- CHEM 2310/15 Organic Chemistry I / Lab 4/1
- CHEM 3000 Quantitative Analysis 3

Complete the following Geology requirements:

- GEO 1110/15 Physical Geology / Lab 3/1
- GEO 1220/25 Historical Geology / Lab 3/1
- GEO 3060 Environmental Geology 3

Complete the following Physics requirements:

- PHYS 1040/45 Elementary Astronomy / Lab 3/1
- PHYS 2210/15 Physics for Scientists/Eng I / Lab 4/1
- PHYS 2220/25 Physics for Scientists & Engineers II 4/1
- PHYS 3710 Modern Physics 3

Complete the following Math/Science support courses:

- BIOL 1610/15 Principles of Biology I / Lab 4/1
- MATH 1210 Calculus I 5
- MATH 1220 Calculus II 4
- SCI 2600 Laboratory Safety 1
- SCI 3570 Foundations of Science / Science Ed 3
- SCI 4800R Independent Research 1

**Science Elective Requirements**

Complete one of the following:

- CHEM 3510 Biochemistry 3
- PHYS 3400 Classical Mechanics 3

**Secondary Education Pre-Professional Courses**

Complete the following pre-professional courses:

- EDUC 1010 Foundations/Intro to Education 3
- EDUC 2010 Intro to Exceptional Learners 3
- EDUC 2400 Foundations of Multicultural & ESL 3
- EDUC 2500 Tech / Educ. / Electronic Portfolio 3
- EDUC 3110 Educational Psychology 3

**Secondary Education Teaching (SET) Program Admission**

To be admitted to the SET program and enroll in Professional courses, students must have completed all pre-professional Education classes with 3.0 or higher GPA with no D credit and students must pass the appropriate PRAXIS II content area subject test(s). In addition, one of the following must be completed:

- Students with BA/BS degrees in progress must have completed at least 95% of major coursework and have approval of major academic content area department advisor
- Students with completed BA/BS or higher degrees must have their transcripts reviewed by content area department advisor

**Secondary Education Professional Requirements**

**Semester I**

Complete the following:

- SCED 3720 Reading / Writing in Content Areas 3
- SCED 4100 Curriculum, Instruction, Assessment 3
- SCED 4600 Classroom Management 3

Complete one of the following:

- SCI 4700 Secondary Sci Teaching Methods 3
- SCED 4700 Content Methods Course 3

**NOTE:**

Students who complete BIOL 2220 General Ecology (3) and BIOL 2225 General Ecology Lab (1) will also meet the requirements for an Earth Science endorsement.
Semester II

Complete the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCED 4900</td>
<td>Secondary Student Teaching</td>
<td>10</td>
</tr>
<tr>
<td>SCED 4989</td>
<td>Student Teacher Seminar</td>
<td>2</td>
</tr>
</tbody>
</table>

Graduation Requirements

1. Complete a minimum of 122 college-level credits (1000 and above).
2. Complete at least 40 upper-division credits (3000 and above).
3. Complete at least 30 upper-division credits at DSC for institutional residency.
4. Cumulative GPA 2.75 or higher.
5. Grade C- or higher in each pre-professional and professional Education and Secondary Education course.
6. 3.0 GPA in pre-professional and professional courses.

Associate of Pre-Engineering

70 credits

The Associate of Pre-Engineering degree has four basic components:

1. General Education & Institutional Requirements
2. Math and Science Requirements
3. Engineering Science Requirements
4. Elective Requirements

General Education & Institutional Requirements

All DSC General Education and Institutional requirements must be fulfilled. A previously earned degree may fulfill those requirements, but courses must be equivalent to DSC’s minimum General Education standards in American Institutions, English, and Mathematics.

Institutional Requirement in Computer Literacy

Complete one of the following:

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<tr>
<td>CIS 1201</td>
<td>Computer Literacy Exam</td>
<td>0</td>
</tr>
<tr>
<td>CS 1400/CS 1410</td>
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<td>6</td>
</tr>
</tbody>
</table>

General Education Requirements

Complete the following:

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<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENGL 1010</td>
<td>Intro to Writing</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 2010</td>
<td>Intermediate Writing</td>
<td>3</td>
</tr>
</tbody>
</table>

Complete one of the following:

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<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIB 1000</td>
<td>Information Literacy Exam</td>
<td>0</td>
</tr>
</tbody>
</table>

Lib 1010 Information Literacy 1

Complete the following:

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics GE course</td>
<td></td>
<td>3-5</td>
</tr>
<tr>
<td>American Institutions GE course</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Life Sciences GE course</td>
<td></td>
<td>3-5</td>
</tr>
<tr>
<td>Physical Sciences course</td>
<td></td>
<td>3-5</td>
</tr>
<tr>
<td>Laboratory Science GE course</td>
<td></td>
<td>0-1</td>
</tr>
<tr>
<td>Fine Arts GE course</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Literature/Humanities GE course</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences GE course</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Exploration GE course</td>
<td></td>
<td>3-5</td>
</tr>
<tr>
<td>Two (2) Global &amp; Cultural Perspectives GE courses</td>
<td></td>
<td>0-6</td>
</tr>
</tbody>
</table>

Math and Science Requirements

Complete the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1210/15</td>
<td>Principles of Chemistry I / Lab</td>
<td>4/1</td>
</tr>
<tr>
<td>MATH 1210</td>
<td>Calculus I</td>
<td>5</td>
</tr>
<tr>
<td>MATH 1220</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 2210</td>
<td>Multivariable Calculus</td>
<td>3</td>
</tr>
<tr>
<td>MATH 2270</td>
<td>Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 2280</td>
<td>Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 2210/15</td>
<td>Physics Scientists &amp; Engineers I/Lab</td>
<td>4/1</td>
</tr>
</tbody>
</table>

Complete one of the following sets of courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1220/25</td>
<td>Principles of Chemistry II / Lab</td>
<td>4/1</td>
</tr>
</tbody>
</table>

OR

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 2220/25</td>
<td>Physics for Sci &amp; Engineers II / Lab</td>
<td>4/1</td>
</tr>
</tbody>
</table>

Pre-Engineering Requirements

Complete the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 1050</td>
<td>Intro to Engineering Design</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 2010</td>
<td>Statics</td>
<td>3</td>
</tr>
</tbody>
</table>

Elective Requirements

Complete at least six (6) credits from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1220, CHEM 1225, CHEM 2310, CHEM 2315, CHEM 2320, CHEM 2325, CS 1400, CS 1410, CS 3005, ENGR 2030, ENGR 2140, ENGR 2300, ENGR 2250, ENGR 2255, ENGR 1810R, ENGR 1820R, MATH 2200, MATH 3400, MATH 3500, PHYS 2220, PHYS 2225, Drafting/Design Software packages</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graduation Requirements

1. Complete a minimum of 70 college-level credits (1000 and above).
2. Complete at least 20 lower-division credits at DSC for institutional residency.
3. Cumulative GPA 2.0 or higher.
Associate of Applied Science in General Technology
Business Emphasis
63 - 68 credits

The Associate of Applied Science in General Technology with a Business Emphasis degree has 4 basic components:

1. General Education & Institutional Requirements
2. General Requirements
3. Business Emphasis Requirements
4. Credit awarded for specialty hours for a certificate of completion document through an approved articulation agreement between DSC and a third party as outlined in R473. Credit will not be awarded until all other program requirements have been met.

General Education & Institutional Requirements
All DSC General Education and Institutional requirements must be fulfilled. A previously earned degree may fulfill those requirements, but courses must be equivalent to DSC’s minimum General Education standards in American Institutions, English, and Mathematics.

Institutional Requirement in Computer Literacy
Complete one of the following:
- CIS 1200 Computer Literacy 3
- CIS 1201 Computer Literacy Exam 0
- CS1400/CS1410 Computer Programming 6

General Education Requirements
Complete the following:
- ECON 1010 Economics of Social Issues 3
- ENGL 1010 Intro to Writing 3
Complete one of the following:
- LIB 1000 Information Literacy Exam 0
- LIB 1010 Information Literacy 1
Complete the following:
- American Institutions GE course 3
- Global & Cultural Perspectives GE course 3

General Requirements
Complete one of the following:
- MATH 1030 Quantitative Reasoning 3
- MATH 1040 Intro to Statistics 3
- MATH 1050 College Algebra / Pre-Calculus 4
- MATH 1080 Math of Technology 3
- STAT 2040 Business Statistics 4

Business Emphasis Requirements
Complete the following:
- ACCT 1010 Applied Business Accounting 3
- BUS 1370 Human Relations 3
- COMM 2110 Interpersonal Communication 3
- FIN 1750 Personal Finance 3
- MGMT 2600 Entrepreneurship 3
- MKTG 2550 Marketing Essentials 3

Technical Speciality
Complete the following: 30
Credit awarded for specialty hours for a certificate of completion document through an approved articulation agreement between DSC and a third party as outlined in R473. Credit will not be awarded until all other program requirements have been met.

Graduation Requirements
1. Complete a minimum of 63 college-level credits (1000 and above).
2. Complete at least 20 lower-division credits at DSC for institutional residency.
3. Cumulative GPA 2.0 or higher.