DEPARTMENT OF CHEMISTRY

Bachelor of Science
CHEMISTRY MAJOR
(Business Option)
2005-2006

This degree program prepares students for a career as a professional chemist in chemical industry by providing students with a formal education in chemistry and a basic education in business. This program is designed more for those students interested both the scientific and the business side of chemical industry, i.e. marketing, sales, finance, management, etc. Students completing this degree program will be prepared to pursue employment in chemistry, graduate studies in chemistry, or the Master of Business Administration degree.

FACULTY ADVISOR: Dr. Philip Crawford

CAREER OPPORTUNITIES:

The chemical industry employs 60% of all chemists. The majority will be involved in research and product development (R & D), sales, management, or marketing. Many work in quality control analysis, and testing products. Others may work in areas such as industrial hygiene and safety or regulatory work for environmental compliance. Because chemical industries deal in the "business of chemistry", advancement opportunities in industry are greatest for chemists "with formal M.B.A. training in areas such as marketing, finance, manufacturing, product planning, logistics, business strategy, corporate development, and organization/management." (Sunil Kumar, "M.B.A. Opportunities for Chemists", *In Chemistry*, 12 (4), 2003) Many marketing managers, plant managers, senior sales executives, corporate development directors, and general managers in chemical industry are chemists or chemical engineers who have obtained the M.B.A. degree. Thus, chemists with an understanding of business are well equipped to meet the challenges of a career in the chemical industry, as well as pursue other career options.

Academic institutions employ about 25% of all chemists. Ph.D.'s are required for most academic positions at the college or university level. High schools require the B.S. in education degree plus subject matter certification.

Government employs about 10% of all chemists. Federal, state, and local government agencies hire chemists for a variety of jobs including basic research, testing work needed to enforce government regulations, technical program managers, and writers and editors of government regulations and technical documents.

A smaller percentage of chemists (5%) work in nontraditional fields. Some are patent lawyers, science writers, information specialists, technical librarians, technical consultants, or business owners.

EMPLOYMENT OUTLOOK/SALARY:

In 2000, chemists and materials scientists held about 92,000 jobs in the U.S.A. This number is expected to grow by 10-20% by 2010. Much of this job growth will be concentrated in pharmaceutical companies and in firms that specialize in research and testing services. Median starting salaries for BS chemists are currently around $32,000 according to the ACS salary survey. (ACS data shows a direct relationship between GPA and starting salaries for BS chemists, i.e. those with higher GPA's generally start at higher salaries.) Median salary for all employed BS chemists was $59,700 according to the ACS 2003 salary survey.

HIGH SCHOOL PREPARATION FOR MAJOR:

Ideal: 4 units English, 3 units of Science (Biology, Chemistry, Physics), and Math through Trigonometry and Pre-calculus.

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Proposed Requirements for B.S. Chemistry Major - Business

	Credit Hours
University Studies Core Curriculum	**27***
University Studies Interdisciplinary Courses	**6***
UI-100 First Year Seminar	**3**
Required Courses (pre-requisites)	**60**
CH185/005/085 General Chemistry I (MA095 or equiv)	5**
CH186 General Chemistry II (CH185)	3
CH187 Qualitative Analysis (CH186 pre or co)	2
CH271 Quantitative Analysis (CH187), offered Fall only	4
CH341 Organic Chemistry I (CH186)	4
CH342 Organic Chemistry Laboratory I (CH341 pre or co)	1
CH343 Organic Chemistry II (CH342 pre or co)	3
CH344 Organic Chemistry Laboratory II (CH343 pre or co)	2
CH311 Physical Chemistry I (CH271, PH121 or PH231, MA240 pre or co), offered Fall only	4
CH312 Physical Chemistry II (CH311), offered Spring only	3
CH313 Physical Chemistry Laboratory (CH312 pre or co), offered Spring only	3
CH498 Professional Presentation in Chemistry (UI433) (NOTE 1)	1
MA140 Analytical Geometry and Calculus I (MA133 and MA134 or equiv)	5**
MA145 Analytical Geometry and Calculus II (MA140)	4
MA240 Analytical Geometry and Calculus III (MA145)	3
PH120/020 Introductory Physics I (MA133 and MA134 or equiv.)	5
PH121/021 Introductory Physics II (PH120)	5
OR	
PH230/030 General Physics I (MA145 pre or co)	5
PH231/031 General Physics II (MA240 pre or co and PH230)	5
UI443 Professional Experience in Chemistry, offered Spring only	3**
Required courses for Business Concentration	**30**
AC221 Principles of Financial Management (MA134, AD101, soph. standing)	3
AC222 Principles of Managerial Accounting (AC221)	3
IS175 Information Systems I (MA134) (This course subs for AD101 in the prerequisites listed for business courses.)	3
EC215 Principles of Microeconomics (AD101, MA134)	3**
EC225 Principles of Macroeconomics (MA134, EC215* or AG245)	3
FI361 Financial Management (AC222, EC225)	3
QM257 Business Statistics (MA139, AD101 or equivalent) **OR**	3
MA223 Elementary Probability and Statistics (MA134 or equivalent)	3
MG301 Management and Organizational Behavior (junior standing)	3
MI375 Management Information Systems (MG301 pre or co, AD101, junior standing)	3
MK301 Principles of Marketing (Junior Standing)	3
EN100 English Composition	0-3
WP003 75 Hour Writing Exam	0
Minimum Degree Requirement	**126-129**

*Does not include hours for University Studies courses included in core curriculum.
**University Studies course

Notes:

1. Required courses offered in both Fall and Spring semesters unless otherwise specified.
2. **Completion of an experiential learning project (undergraduate research, internship) in the major is required of all graduates effective Spring of 2003. Requirement met by completion of CH498 Professional Presentation in Chemistry. Consult with your departmental advisor.**
3. Upon completion of the Chemistry with business emphasis degree program, students may apply directly to the MBA program at Southeast. For more information about the MBA degree program, contact the MBA office in the Robert A. Dempster Hall at Southeast Missouri State University.

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Suggested 8 Semester Sequence

First Semester	**Hrs.**	**Second Semester**	**Hrs.**
UI100 First Year Seminar	3	CH186 General Chemistry II	3
CH185 Gen. Chem. I Lec	5	CH187 Qualitative Analysis	2
CH085 Gen. Chem. I Lab	+	MA140 Analyt. Geom. & Calc. I	5
CH005 Gen. Chem. I Rec.	+	EN140 Rhet. & Crit. Thinking	3
University Studies Elective	3	EC215 Principles of Microeconomics	3
EN100 English Comp	3		
IS175 Informaton Systems	3		
Third Semester*	**Hrs.**	**Fourth Semester**	**Hrs.**
CH341 Organic Chemistry I	4	CH343 Organic Chem. II	3
CH342 Organic Chemistry II Lab	1	CH344 Organic Chem. I Lab	2
PH230 General Physics I Lec	5	PH231 General Physics II Lec	5
PH030 General Physics I Lab	+	PH031 General Physics II Lab	+
or		**or**	
PH120 Intro. Physics I Lec	5	PH121 Intro. Physics II Lec	5
PH020 Intro. Physics I Lab	+	PH021 Intro. Physics II Lab	+
MA145 Analyt. Geom. & Calc. II	4	University Studies Electives	3
EC225 Principles of Macroeconomics	3	AC221 Principles of Financial Management	3

Fifth Semester	**Hrs.**	**Sixth Semester**	**Hrs.**
CH271 Quantitative Analysis	4	University Studies Electives	9
University Studies Electives	6	UI443 Professional Experiences in Chemistry	3
AC222 Principles of Managerial Acct.	3	FI361 Financial Management	3
MA240 Analyt. Geom. & Calc. III	3	QM257 Business Statistics	3
		or	0
		MA223 Elem. Probability and Statistics	
		WP003 75 Hour Writing Exam	
Seventh Semester	**Hrs.**	**Eighth Semester**	**Hrs.**
CH311 Physical Chemistry I	4	CH312 Physical Chemistry II	3
UI3XX University Studies**	3	CH313 Physical Chemistry Lab	3
University Studies Electives	3	UI3XX University Studies	3
MG301 Management and Org. Behavior	3	CH498 Professional Presentation in Chem	1
MI375 Management Information Syst.	3	MK301 Principles of Marketing	3

*Since all chemistry courses numbered 200 and above may only be offered one semester a year, it is strongly recommended that all chemistry majors consult with a chemistry staff member before the end of their Freshman year.

**UI331 Biochemistry I (3) will count as both a chemistry elective and UI3XX University Studies course.