SAINT FRANCIS UNIVERSITY

BIOLOGY DEPARTMENT

STUDENT HANDBOOK

2015 – 2016 Academic Year

Table of Contents

2015 - 2016 ACADEMIC CALENDAR

FALL SEMESTER 2015

International students arrive	Wednesday, August19, 2015
Freshman class arrives	Thursday, August 20
New Student Orientation	Thursday-Sunday, August 20-23
Upperclass residents move-in	Sunday, August 23
Classes begin, 8:00 a.m.	Monday, August 24
Last day for schedule change	Tuesday, September 1
Last day for P/F grading option	Tuesday, September 1
"Reaching Every Door" (compressed classes)	Wednesday, October 7
Mid-semester grades due +	Friday, October 9
Mid-semester break	Saturday - Tuesday, Oct.17-20
Classes resume	Wednesday, October 21
Last day to withdraw from a course	Monday, November 2
Registration for Spring Semester 2016	Monday-Friday, Nov. 9-13
Thanksgiving break	Wednesday-Sunday, Nov. 25-29
Classes resume	Monday, November 30
Last day of classes	Friday, December 4
Final examinations	Monday - Saturday, Dec. 7-12
Residence halls close	Saturday, December 12, noon

SPRING SEMESTER 2016

Residents move-in	Sunday, January 10, 2016
Classes begin, 8:00 a.m.	Monday, January 11
Last day for schedule change	Tuesday, January 19
Last day for P/F grading option	Tuesday, January 19
Mid-semester grades due +	Friday, February 26
Mid-semester break	Saturday-Sunday, February 27-March 6
Classes resume	Monday, March 7
Easter Break	Thursday – Monday, March 24-28
Classes resume	Tuesday, March 29
Last day to withdraw from a course	Tuesday, March 29
Registration for Fall Semester 2016	Monday- Friday, April 11-15
Last day of classes *	Wednesday, April 27
Final examinations	Thursday – Wednesday, April 28 - May 4
Residence halls close	Wednesday, May 4, noon
Commencement	Sunday, May 8

*To ensure that each course meets the required number of times during spring semester 2016, classes that ordinarily meet on Thursdays will also meet on Tuesday, April 26. Classes that ordinarily meet on Fridays will also meet on Wednesday, April 27.
+Dates for faculty to submit grades on-line.

SUMMER SESSION 2016

First day of Summer Session	Monday, May 9
Memorial Day – University holiday	Monday, May 30
Independence Day – University holiday	Monday, July 4
Last day of Summer Session	Saturday, August 20

A WELCOME MESSAGE FROM THE DEPARTMENT CHAIRPERSON

August 24, 2015

Dear Biology Major:

Welcome to the Biology Department at Saint Francis University. This "Biology Department Student Handbook" should serve as a valuable resource for you during your course of study. The handbook contains information about the faculty in the department, the requirements for the various concentrations, and reminders and advice on how to be a successful student in your chosen career field. However, the handbook is a working manual to be used in conjunction with the University Catalog and frequent consultations with your academic advisor.

I would like to thank Ms. Shelley Kirkpatrick for the many hours she spent compiling and revising this handbook.

Sincerely,

Marian G. Langer, Ph. D
Chair

GOALS OF FRANCISCAN HIGHER EDUCATION AT SAINT FRANCIS UNIVERSITY

Saint Francis University, grateful for the Franciscan heritage of the institution and open to the living spirit of Saint Francis of Assisi, strives to incorporate these Franciscan values into the life and work of the community.

1. A HUMBLE AND GENEROUS ATTITUDE TOWARD LEARNING

Aware that all talents of mind and heart are gifts of God, the source of all good, and realizing that knowledge is not a personal possession intended solely for self-advancement, as members of the Saint Francis community we strive to share our abilities and skills generously with others. We seek not the power and prestige of knowledge nor the desire to control or dominate but to serve. We strive for excellence without arrogance, willingly sharing our knowledge and wisdom, and humbly learning from one another. As a community of learners seeking the truth together, we encourage the free and open exchange of ideas and responsible action.

2. REVERENCE FOR ALL LIFE AND FOR THE GOODNESS OF ALL HUMANITY

As children of God, we are brothers and sisters to each other, to all humanity, and to all God's creatures. Thus we strive to show reverence for all human life and for life in all its forms, to treat all people with dignity and respect, and to work together for the common good. In a spirit of charity, we care for and support each other, helping to bind the wounds of those who suffer and bearing one another's burdens. We also care for the earth which is our home and work to protect and preserve it for future generations.

3. A GLOBAL VISION

As citizens of the earth and as brothers and sisters in the global community, we embrace all classes of people and respect all cultures, all races, and all religions. We strive to resolve conflict non-violently and to work for justice within our community, our society, and our world. We work to build up God's people everywhere, to bring reconciliation, and to act as instruments of peace in the communities we serve.

4. SERVICE TO THE POOR AND THE NEEDY

In the spirit of Saint Francis, the poverello, we strive to be compassionate to all and especially to the poor and disenfranchised. Recognizing our own dependence on God and on others, and trusting in His providence, we engage in active service to the poor and to those with special needs such as the elderly and youth, the ill and the imprisoned. With gratitude to those who share their means to help us accomplish our Franciscan mission, we seek also to exercise a wise and careful stewardship of the institution's resources. We commit ourselves to honesty and integrity in our work, accept personal responsibility for our actions, and exercise high ethical standards in our personal and professional lives.

5. RESPECT FOR THE UNIQUENESS OF INDIVIDUAL PERSONS

In imitation of Francis of Assisi, who was open to human personality in all its variety and who saw the image of God multiplied but never monotonous, we recognize that each individual person is a unique combination of God-given abilities. We know that each person expresses the goodness of God in a particular way. Every member of the University community thus deserves to be treated respectfully and each should treat others with respect. Students especially should be accorded as much personal attention as possible. With education of the whole person as our goal, we endeavor to foster the intellectual, physical, social, and spiritual growth of Saint Francis students and to prepare them not just for productive careers but for fruitful lives.

6. A COMMUNITY OF FAITH AND PRAYER

The Saint Francis community, while respecting the religious beliefs and traditions of others, seeks to listen to the Word of God and to observe the Gospel of Jesus Christ. The University strives to promote the spiritual growth and development of its member and invites all to gather in prayer and worship and, when possible, to participate in the Eucharist and in the sacramental life of the Church. The University is devoted to the Catholic Church and its leaders and strives to serve the educational and spiritual needs of the Church's clergy, religious, and laity.

7. THE SPIRIT OF SIMPLICITY AND JOY

Imitating Francis, who called himself the herald of the Great King and the troubadour of God, the Saint Francis community celebrates life in simplicity and joy. With good humor and common sense, we share our stories and teach by good example. We also extend courtesy and hospitality to all guests and to all who wish to join this community.

8. FRANCISCAN PRESENCE

The University gratefully acknowledges the vision, sacrifice, and zeal of our Franciscan founders and of the friars who have served the campus community loyally over the years. We strive to emulate the Franciscan values evident in their ministry. Franciscan presence also encompasses all men and women of good will who have been associated with the University and whose lives and work exemplify the ideals of Saint Francis. We encourage and promote these values for future generations, knowing that as long as the spirit of Francis of Assisi continues to animate this community of learners, Saint Francis University will be graced with Franciscan presence.

BIOLOGY DEPARTMENT VISION

To meet the challenges of teaching biological sciences in the 21st century, the Biology Department anticipates new facilities. These new facilities will enable us to update both our teaching and undergraduate research, as well as to attract potential students into our programs. Biology Department faculty will continue to investigate new enrollment initiatives and write grant proposals to modernize laboratories for teaching and research. Faculty will work together as a team to build a learning environment that supports the needs of a diverse student group. The faculty will remain current in their respective fields and bring new discoveries into the classroom. These efforts will require University support for release time, sabbaticals, grant writing opportunities, and program development.

BIOLOGY DEPARTMENT MISSION

The Biology Department of Saint Francis University is committed to excellence in undergraduate education by offering a broad-based curriculum complete with current knowledge and the technical skills required for professional biologists. Through strong faculty mentoring, classroom instruction, laboratory experiences, undergraduate research opportunities, internships, professional affiliations, and extracurricular activities, we help our students to:

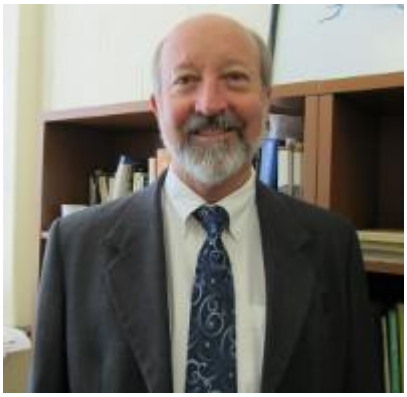
- Gain an understanding of and appreciation for the biological sciences,
- Build valuable technical, analytical, and critical thinking skills,
- Develop communication skills to effectively relate knowledge and ideas to both the scientific community and the general public,
- Prepare for their futures in graduate and professional schools, or in the job market as professional biologists, teachers, or medical technologists,
- Integrate their broad knowledge in biology and the liberal arts to make informed decisions as active, learned citizens in society.

In addition, we support the liberal arts tradition by offering courses for non-majors that instill the ability to think and converse rationally on a wide diversity of current scientific topics. We also serve as resource persons for the University community and the larger non-academic community.

BIOLOGY DEPARTMENT LEARNING OBJECTIVES

1. Employ the scientific method, including the use of discipline-specific techniques, to discover and validate biological knowledge.
2. Demonstrate scientific literacy through reading, writing, presenting, and discussing research.
3. Demonstrate knowledge of how atoms and molecules contribute to the structure and function of living systems.
4. Demonstrate basic knowledge of molecular genetics and the inheritance of traits.
5. Explain how cells and organisms sense and control their internal environment, and how they respond to change.
6. Describe how evolution by natural selection explains the unity and diversity of life on earth.
7. Articulate interactions of organisms at the populations, community, and ecosystem levels.

BIOLOGY DEPARTMENT FACULTY AND STAFF



Dr. Charles MacVean
Dean, School of Sciences
Science Center 027
(814) 471-1156
cmacvean@francis.edu

Dr. Marian Langer
Chair, Biology Department
Professor/Coordinator for Pre-Podiatry Concentration/Co-Coordinator Interdisciplinary Neuroscience Minor
Science Center 108
(814) 472-3080
mlanger@francis.edu

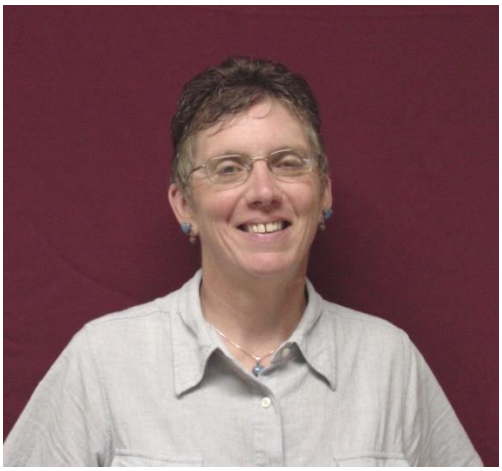
Courses taught:
- Comparative Anatomy Lecture & Lab
- Developmental Biology Lecture & Lab
- Human Anatomy & Physiology I & II Lecture & Labs
- Neuroscience

Dr. Gail Drus
Assistant Professor
Science Center 112
(814) 471-1267
gdrus@francis.edu

Courses taught:
- BIOL 110 lab
- BIOL 111 lecture
- Science 101

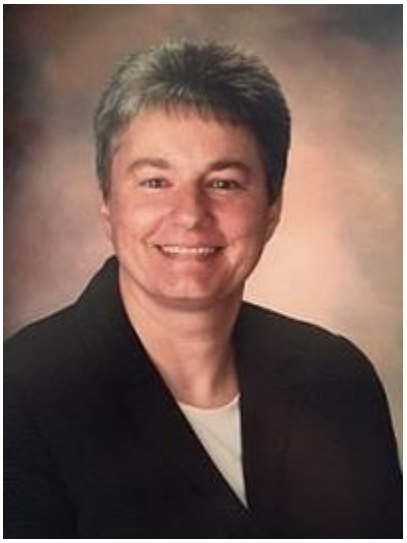
Ms. Kelly Garanich
Instructor
Science Center 104
(814) 472 -3987
kgaranich@francis.edu

Courses taught:
Biology 110 Lab
Biology 111 Lecture & Lab
Human Anatomy & Physiology I & II Lecture & Lab
Biology Freshman Seminar



Mrs. Loretta Johnson
Instructor
Science Center 118
(814) 472-3898
ljohnson@francis.edu

Courses taught:
Biology 111
Clinical Microbiology Labs
Human Anatomy & Physiology I & II Lecture & Labs

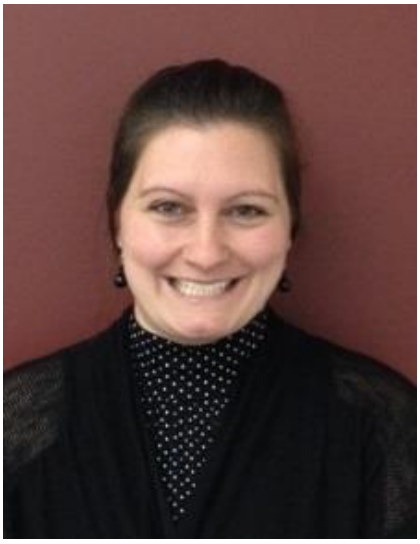


Ms. Shelley Kirkpatrick
Assistant Professor
Science Center 117
(814) 472-3179
skirkpatrick@francis.edu

Courses taught:
Human Biology
Conservation Biology
Human Anatomy & Physiology I & II Lecture & Labs
Marine Biology Lab
Biology Senior Seminar

Dr. Lane Loya
Associate Professor/Coordinator of Environmental Sciences Concentration
Science Center 114
(814) 472-3094
lloya@francis.edu

Courses taught:
- Biology 110 Lecture
- Biology 111 Lecture & Lab
- Ecology Lecture & Lab
- Invertebrate Zoology Lecture & Lab
- Environmental Chemistry
- Problems in Environmental Science

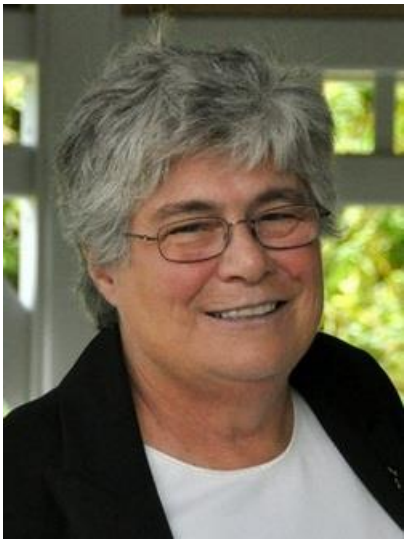


Dr. Amanda Martino
Visiting Assistant Professor
Science Center 116
(814) 471- 1203
amartino@francis.edu

Courses taught:
- Biology 111 Lecture & Lab

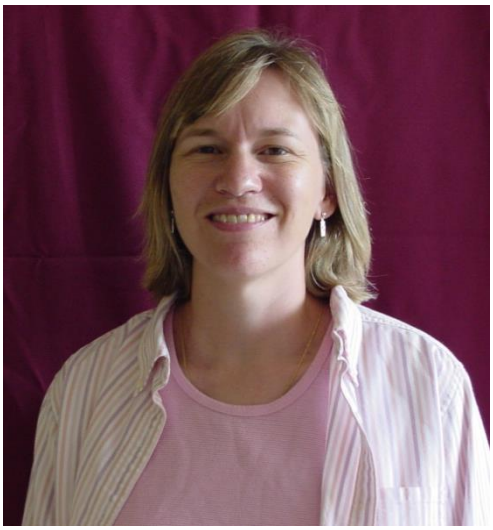
Dr. Justin Merry
Associate Professor
Science Center 109
(814) 471-1105
jmerry@francis.edu

Courses taught:
- Biology 111 Lecture
- Human Anatomy & Physiology I & II Lecture & Lab
- Animal Behavior Lecture & Lab
- Neuroscience
- Science 101
- Biology Junior Seminar



Dr. Devonna Sue Shoemaker
Professor Emeritus
Science Center 103
(814) 472-3321
smorra@francis.edu

Courses taught:
Field Biology
Animal Nutrition
Animal Care & Handling



Dr. Sue Reimer
Professor/Coordinator of Molecular Biology Concentration
Science Center 110
(814) 472-3086
sreimer@francis.edu

Courses taught:
Human Heredity
Biology 111 Lecture
Genetics Lecture & Lab
Cell and Molecular Biology Lecture & Lab
Biochemistry

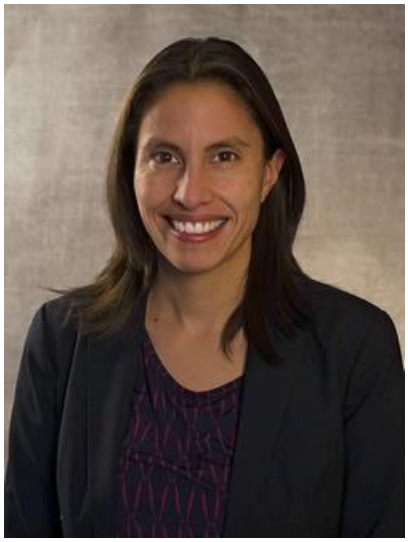
Mr. Andrew Scanlan
Visiting Instructor of Biology
Science Center 102
(814) 471-1105
amscanlan@francis.edu

Courses taught:
Environmental Science
Biology 111 Lecture & Lab

Ms. Beverly Smith
Administrative Assistant
Science Center 107
(814) 472-3089
bsmith@francis.edu

Dr. John Trimble
Professor/Coordinator of Biochemistry Concentration
Science Center 113
(814) 472-3319
jtrimble@francis.edu

Courses taught:
- Biology 111
- Human Biology
- Clinical Microbiology Lecture & Lab
- General Microbiology Lecture & Lab
- Cell and Molecular Biology Lecture & Lab
- Evolution



Dr. Irene Wolf
Assistant Professor
Science Center 111
(814) 471-1170
iwolf@francis.edu

Courses Taught:
- Biology 111 Lecture & Lab
- Human Anatomy & Physiology I & II Lecture & Lab
- Vertebrate Physiology Lecture & Lab
- Biology Sophomore Seminar

BIOLOGY DEPARTMENT FACILITIES

The Biology Department is housed in Science Center. All of our administrative/faculty offices and laboratories are located on the First Floor. Here are some of the main rooms that you will use in our Department during your years at SFU:

Science Center 107 – Biology Administrative Office. The reception office of the Faculty Support Specialist is located here. This is the place to go for many of your general questions, to pick up forms, get information on post-graduate exams, work-study time cards, etc.

Science Center 105 – Multidisciplinary Environmental Research Laboratory

Science Center 115 – Laboratory for Biology I and Biology II courses

Science Center 119 – Biology student zone

Science Center 123 – Laboratory for General Microbiology and Clinical Microbiology courses

Science Center 126 – Laboratory for Developmental Biology, Genetics, and Cell & Molecular Biology courses

Science Center 127 – Cell Culture Room

Science Center 128 – Undergraduate research laboratory

Science Center 129 – Dark room

Science Center 130 – Marine Biology Laboratory

Science Center 133 – Ecology Laboratory

Science Center 135 – Laboratory for Anatomy & Physiology, Comparative Anatomy, and Vertebrate Physiology courses

Science Center 034 – Vivarium

Greenhouse – Facility for the care and propagation of plants for the Biology II course and the Department in general

Lake Saint Francis Watershed Trail – This 1.5 mile path is located in the forest just behind the SFU campus and was designed to provide access to the school's quieter, more natural areas. Saint Francis students are welcome to use the trail for fitness, relaxation, and even to enrich their academic experience. Many of the classes at Saint Francis incorporate use of the watershed trail into the curriculum. To increase knowledge of the local ecology, the trail is lined with thirty interpretive signs that explain the features of the landscape.

BIOLOGY DEPARTMENT PROGRAM CHECKSHEETS

On the following pages you will find checksheets for the various programs and concentrations available within the Biology Department. You should become familiar with the requirements of your particular major. This will assist you when working with your academic advisor and also help to ensure that you meet all requirements necessary for successful progression through your major and for graduation from Saint Francis University.

BI-A (BIOLOGY - B.A.)

Bachelor of Arts, Biology (B.A.)

Course No.	Description	Cr.
First Year	**Fall**	
□ BIOL 110	Evolution, Ecol, & Plant Biol.	4
□ CHEM 101	Chemistry Principles I	4
□ MATH 121	Calculus/Geom I	3
or 112	Calculus	
□ ENGL 103	Writing for Discipline	3
□ HIST xxx	History Elective	3
□ CORE 103	Fall Comm. Enrich. Series	0
□ BIOL 131	Biology Freshman Seminar	0
Total Credits		**17**
Second Year	**Fall**	
□ BIOL xxx	Biology Cluster Course	3-4
□ CHEM 201	Organic Chemistry I	4
□ ENGL 104	Intro to Literature	3
□ PHIL 205	Reason and Responsibility	3
□ GETM I	Ethics Outer Core (I)	3
□ CORE 211	Personal Wellness	0
Total Credits		**16-17**
Third Year	**Fall**	
□ BIOL 301	Genetics	4
□ PHYS 104	Intro to Physics I	4
or 121	Gen. Physics I	
□ LANG xxx	Foreign Lang. (102 or higher)	3
□ SOC SCI	Elective	3
□	Free Elective for Minor	3
□ BIOL 331	Biology Junior Seminar	0
□ EXAM 301	Writing Competency	0
Total Credits		**17**
Fourth Year	**Fall**	
□ BIOL xxx	Biology Elective	2
□	Free Elective for Minor	3
□	Free Elective for Minor	3
□	Free Elective	3
□	Free Elective	2
Total Credits		**13**

Course No.	Description	Cr.
First Year	**Spring**	
□ BIOL 111	Molecules, Cells, & Anim. Phys.	4
□ CHEM 102	Chemistry Principles II	4
□ Statistics	Statistics Course (see note)	3-4
□ CORE 113	Gen Ed 1st Year Seminar	3
□ CORE 104	Spring Comm. Enrich. Series	0
□ RLST 105	Francis and Global Issues	3
Total		**17-18**
Second Year	**Spring**	
□ BIOL xxx	Biology Cluster Course	3-4
□ BIOL xxx	Biology Cluster Course	3-4
□ SOC SCI	Elective	3
□ GETM III	Div & Comm Outer Core (III)	3
□ FNAR xxx	Fine Arts Elective	3
□ CORE 212	Community & Global Wellness	0
□ BIOL 231	Biology Sophomore Seminar	0
Total		**15-17**
Third Year	**Spring**	
□ BIOL xxx	Biology Elective	4
□ GETM IV	Soc Sys Outer Core (IV)	3
□	Free Elective for Minor	3
□	Free Elective for Minor	3
□	Free Elective	3
Total		**16**
Fourth Year	**Spring**	
□ BIOL 402	Evolution	3
□ BIOL 431	Biology Senior Seminar	1
□	Free Elective for Minor	3
□	Free Elective	3
□ CORE 407	Keystone Seminar	3
□ EXAM 401	Dept. Comp. Exam	0
Total		**13**

****Sequence of courses may be altered with consent of advisor.*

Biology Clusters

F = Fall; S = Spring; Su = Summer; AN = As Needed

At least 1 course is required from each cluster.

Ecology Cluster
- BIOL 203 – Ecology (F)
- BIOL 208 – Animal Behavior (F)
- BIOL 220 – Conservation Biology (S)
- BIOL 320 – Natural History of Vertebrates (AN)
- BIOL 322 – Field Biology (S,Su)
- BIOL 326 – Freshwater Aquatic Biology (F)

Molecules and Cells Cluster
- BIOL 302 – General Microbiology (S)
- BIOL 305 – Immunology (S)
- BIOL 401 – Cell & Molecular Biology (F)
- BIOL 405 – Biochemistry (S)
- BIOL 430 – Adv. Lab. Methods Molec. Bio. (S)

Organismal Biology Cluster
- BIOL 204 – Invertebrate Zoology (F)
- BIOL 211 – Comparative Anatomy (F)
- BIOL 212 – Developmental Biology (S)
- BIOL 218 – Marine Biology (S)
- BIOL 306 – Animal Nutrition (F)
- BIOL 403 – Advanced Botany (F)
- BIOL 406 – Vertebrate Physiology (S)

Biology Elective Courses:

Any of the cluster courses above
- BIOL 420-424 – Biology Research
- Any 300-, 400-, or 500-level Biology course

Statistics Requirement can be fulfilled by:
- BIOL 315 – Biostatistics (S)
- MATH 215 – Introductory Statistics (F,S)
- STAT 205 – Essentials of Statistics (F,S)

Notes:

A minor (beyond gen. ed. thematic minor), double-major, or pre-law concentration is <u>REQUIRED</u> for this degree.

Consider undergraduate research

Job Shadow during summer

BI-S (BIOLOGY - B.S.)

Bachelor of Science, Biology (B.S.)

Course No.	Description	Cr.
First Year	**Fall**	
□ BIOL 110	Evolution, Ecol, & Plant Biol.	4
□ CHEM 101	Chemistry Principles I	4
□ MATH 121	Calculus/Geom I	3
or 112	Calculus	
□ ENGL 103	Writing for Discipline	3
□ HIST xxx	History Elective	3
□ CORE 103	Fall Comm. Enrich. Series	0
□ BIOL 131	Biology Freshman Seminar	0
Total Credits		**17**
Second Year	**Fall**	
□ BIOL xxx	Biology Cluster Course	3-4
□ CHEM 201	Organic Chemistry I	4
□ ENGL 104	Intro to Literature	3
□ PHIL 205	Reason and Responsibility	3
□ GETM I	Ethics Outer Core (I)	3
□ CORE 211	Personal Wellness	0
Total Credits		**16-17**
Third Year	**Fall**	
□ BIOL 301	Genetics	4
□ PHYS 104	Intro to Physics I	4
or 121	Gen. Physics I	
□ LANG xxx	Foreign Lang. (102 or higher)	3
□ SOC SCI	Elective	3
□	Free Elective	3
□ BIOL 331	Biology Junior Seminar	0
□ EXAM 301	Writing Competency	0
Total Credits		**17**
Fourth Year	**Fall**	
□ BIOL xxx	Biology Elective	4
□ BIOL xxx	Biology Elective	4
□	Free Elective	3
□	Free Elective	3
Total Credits		**14**

Course No.	Description	Cr.
First Year	**Spring**	
□ BIOL 111	Molecules, Cells, & Anim. Phys.	4
□ CHEM 102	Chemistry Principles II	4
□ Statistics	Statistics Course (see note)	3-4
□ RLST 105	Francis and Global Issues	3
□ CORE 113	Gen Ed 1st Year Seminar	3
□ CORE 104	Spring Comm. Enrich. Series	0
Total Credits		**17-18**
Second Year	**Spring**	
□ BIOL xxx	Biology Cluster Course	3-4
□ CHEM 202	Organic Chemistry II	4
□ SOC SCI	Elective	3
□ GETM III	Div & Comm Outer Core (III)	3
□ FNAR xxx	Fine Arts Elective	3
□ CORE 212	Global & Community Wellness	0
□ BIOL 231	Biology Sophomore Seminar	0
Total Credits		**16-17**
Third Year	**Spring**	
□ BIOL xxx	Biology Cluster Course	3-4
□ PHYS 105	Intro to Physics II	4
or 122	Gen. Physics II	
□ GETM IV	Soc Sys Outer Core (IV)	3
□	Free Elective	3
□	Free Elective	3
Total Credits		**16-17**
Fourth Year	**Spring**	
□ BIOL 402	Evolution	3
□ BIOL 431	Biology Senior Seminar	1
□ BIOL xxx	Biology Elective	2
□	Free Elective	3
□ CORE 407	Keystone Seminar	3
□ EXAM 401	Dept. Comp. Exam	0
Total Credits		**12**

****Sequence of courses may be altered with consent of advisor.*

Biology Clusters

F = Fall; S = Spring; Su = Summer; AN = As Needed

At least 1 course is required from each cluster.

Ecology Cluster
- BIOL 203 – Ecology (F)
- BIOL 208 – Animal Behavior (F)
- BIOL 220 – Conservation Biology (S)
- BIOL 320 – Natural History of Vertebrates (AN)
- BIOL 322 – Field Biology (S,Su)
- BIOL 326 – Freshwater Aquatic Biology (F)

Molecules and Cells Cluster
- BIOL 302 – General Microbiology (S)
- BIOL 305 – Immunology (S)
- BIOL 401 – Cell & Molecular Biology (F)
- BIOL 405 – Biochemistry (S)
- BIOL 430 – Adv. Lab. Methods Molec. Bio. (S)

Organismal Biology Cluster
- BIOL 204 – Invertebrate Zoology (F)
- BIOL 211 – Comparative Anatomy (F)
- BIOL 212 – Developmental Biology (S)
- BIOL 218 – Marine Biology (S)
- BIOL 306 – Animal Nutrition (F)
- BIOL 403 – Advanced Botany (F)
- BIOL 406 – Vertebrate Physiology (S)

Biology Elective Courses:

Any of the cluster courses above, or
- BIOL 420-424 – Biology Research, or
- Any 300-, 400-, or 500-level Biology course

Statistics Requirement can be fulfilled by:
- BIOL 315 – Biostatistics (S)
- MATH 215 – Introductory Statistics (F,S)
- STAT 205 – Essentials of Statistics (F,S)

Suggestions:
- Consider undergraduate research
- Job Shadow during summer
- If pursuing graduate school, prepare for graduate school entrance exams during summer after junior year.

BI-E (BIOLOGY - SECONDARY EDUCATION – B.S.)

Bachelor of Science, Biology: Secondary Education Concentration (BI-SE)

****Course sequence may be altered with advisor consent*

Course No.	Description	Cr.	Course No.	Description	Cr.
First Year	**Fall**		**First Year**	**Spring**	
□ BIOL 110	Evolution, Ecol, & Plant Biol.	4	□ BIOL 111	Molecules, Cells, & Anim. Phys.	4
□ CHEM 101	Chemistry Principles I	4	□ CHEM 102	Chemistry Principles II	4
□ ENGL 103	Writing for Discipline	3	□ HIST xxx	History Elective	3
□ RLST 105	Francis and Global Issues	3	□ CORE 113	Gen Ed 1st Year Seminar	3
□ PSYC 101	Introduction to Psychology	3	□ EDUC 150	Educational Psychology	3
□ CORE 103	Fall Comm. Enrich. Series	0	□ CORE 104	Spring Comm. Enrich. Series	0
□ BIOL 131	Biology Freshman Seminar	0			
Total Credits		**17**	**Total**		**17**
Second Year	**Fall**		**Second Year**	**Spring**	
□ BIOL xxx	Biology Cluster Course	3-4	□ BIOL xxx	Biology Cluster Course	3-4
□ CHEM 201	Organic Chemistry I	4	□ CHEM 202	Organic Chemistry II	4
□ ENGL 104	Intro to Literature	3	□ Statistics	Statistics Course (see note)	3-4
□ MATH 121	Calculus/Geom I	3	□ EDUC 333	Read. & Writ. In Content Area	3
or MATH	Calculus		□ PHIL 205	Reason and Responsibility	3
□ EDUC 101	Foundations of Education	3	□ CORE 212	Community & Global Wellness	0
□ CORE 211	Personal Wellness	0	□ BIOL 231	Biology Sophomore Seminar	0
Total Credits		**16-17**	**Total**		**16-18**
Third Year	**Fall**		**Third Year**	**Spring**	
□ BIOL 301	Genetics	4	□ BIOL 302	General Microbiology	4
□ PHYS 104	Intro to Physics I	4	□ PHYS 105	Intro to Physics II	4
or 121	Gen. Physics I		or 122	Gen. Physics II	
□ EDUC 430	Middle & High Sch.	3	□ BIOL 402	Evolution	3
□ EDUC 205	Intro to Special Education	3	□ BIOL 431	Biology Senior Seminar	1
□ GETM I	Ethics Outer Core (I)	3	□ LANG xxx	Foreign Lang. (102 or higher)	3
□ BIOL 331	Biology Junior Seminar	0	□ EDUC 429	Middle / Secondary Methods	2
□ EXAM 301	Writing Competency	0	□ EXAM 401	Dept. Comp. Exam	0
Total Credits		**17**	**Total**		**17**
Fourth Year	**Fall**		**Fourth Year**	**Spring**	
□ BIOL xxx	Biology Elective	3-4	□ EDUC 412	Student Teaching	12
□ GETM III	Div & Comm Outer Core (III)	3	□ CORE 407	Keystone Seminar	3
□ GETM IV	Soc Sys Outer Core (IV)	3			
□ FNAR xxx	Fine Arts Elective	3			
□ SOC SCI	Elective	3			
Total Credits		**15-16**	**Total**		**15**

Biology Clusters

F = Fall; S = Spring; Su = Summer; AN = As Needed

At least 1 course is required from each cluster.
Note: BIOL 302 is required and satisfies the Molecules and Cells Cluster requirement.

Ecology Cluster
BIOL 203 – Ecology (F)
BIOL 208 – Animal Behavior (F)
BIOL 220 – Conservation Biology (S)
BIOL 320 – Natural History of Vertebrates (AN)
BIOL 322 – Field Biology (S,Su)
BIOL 326 – Freshwater Aquatic Biology (F)

Molecules and Cells Cluster
BIOL 302 – Gen. Microbiology (S) (required)
BIOL 305 – Immunology (S)
BIOL 401 – Cell & Molecular Biology (F)
BIOL 405 – Biochemistry (S)
BIOL 430 – Adv. Lab. Methods Molec. Bio. (S)

Organismal Biology Cluster
BIOL 204 – Invertebrate Zoology (F)
BIOL 205 – Human Anatomy & Phys I (F)
BIOL 206 – Human Anatomy & Phys II (S)
BIOL 211 – Comparative Anatomy (F)
BIOL 212 – Developmental Biology (S)
BIOL 218 – Marine Biology (S)
BIOL 306 – Animal Nutrition (F)
BIOL 403 – Advanced Botany (F)
BIOL 406 – Vertebrate Physiology (S)

Secondary Education Elective Course:
Any of the cluster courses above, or
BIOL 420-424 – Biology Research, or
Any 300-, 400-, or 500-level Biology course

Statistics Requirement can be fulfilled by:
BIOL 315 – Biostatistics (S)
MATH 215 – Introductory Statistics (F,S)
STAT 205 – Essentials of Statistics (F,S)

Many Secondary Ed. students opt to take BIOL 205 & 206 Human Anatomy & Physiology

BI-PR (PRE-PROFESSIONAL CONCENTRATION - B.S.)

Bachelor of Science, Biology: Pre-Professional Concentration (BI-PR)					
Course No.	**Description**	**Cr.**	**Course No.**	**Description**	**Cr.**
First Year	**Fall**		**First Year**	**Spring**	
□ BIOL 110	Evolution, Ecol, & Plant Biol.	4	□ BIOL 111	Molecules, Cells, & Anim. Phys.	4
□ CHEM 101	Chemistry Principles I	4	□ CHEM 102	Chemistry Principles II	4
□ MATH 121	Calculus/Geom I	3	□ Statistics	Statistics Course (see note)	3-4
□ HIST xxx	History Elective	3	□ RLST 105	Francis and Global Issues	3
□ CORE 103	Fall Comm. Enrich. Series	0	□ CORE 113	Gen Ed 1st Year Seminar	3
□ BIOL 131	Biology Freshman Seminar	0	□ CORE 104	Spring Comm. Enrich. Series	0
			□ ENGL 103	Writing for Discipline	3
Total Credits		**14**	**Total Credits**		**17-18**
Second Year	**Fall**		**Second Year**	**Spring**	
□ BIOL 211	Comp. Vertebrate Anat.	4	□ BIOL 406	Vertebrate Physiology	4
□ CHEM 201	Organic Chemistry I	4	□ CHEM 202	Organic Chemistry II	4
□ ENGL 104	Intro to Literature	3	□ SOC SCI	Elective	3
□ PHIL 205	Reason and Responsibility	3	□ PHIL 312	Health Care Ethics	3
□ GETM III	Div & Comm Outer Core (III)	3	□ FNAR xxx	Fine Arts Elective	3
□ CORE 211	Personal Wellness	0	□ CORE 212	Community & Global Wellness	0
			□ BIOL 231	Biology Sophomore Seminar	0
Total Credits		**17**	**Total Credits**		**17**
Third Year	**Fall**		**Third Year**	**Spring**	
□ BIOL 301	Genetics & lab	4	□ BIOL 302	General Microbiology	4
□ PHYS 104	Intro to Physics I	4	□ PHYS 105	Intro to Physics II	4
or 121	Gen. Physics I		or 122	Gen. Physics II	
□ BIOL 401	Cell & Molecular Biology	4	□ GETM IV	Soc Sys Outer Core (IV)	3
□ SOC SCI	Elective	3	□ BIOL 405	Biochemistry	3
□ BIOL 331	Biology Junior Seminar	0	□	Free Elective	3
□ EXAM 301	Writing Competency	0			
Total Credits		**15**	**Total Credits**		**17**
Fourth Year	**Fall**		**Fourth Year**	**Spring**	
□ BIOL xxx	Biology Elective	4	□ BIOL 402	Evolution	3
□ LANG xxx	Foreign Lang. (102 or higher)	3	□ BIOL 431	Biology Senior Seminar	1
□	Free Elective	3	□	Free Elective	3
□	Free Elective	3	□	Free Elective	3
□	Free Elective	3	□ CORE 407	Keystone Seminar	3
			□ EXAM 401	Dept. Comp. Exam	0
Total Credits		**16**	**Total Credits**		**13**

****Sequence of courses may be altered with consent of advisor.*

Biology Elective Course:

Students should take one of the following:

BIOL 203 – Ecology (F)
BIOL 208 – Animal Behavior (F)
BIOL 212 – Developmental Biology (S)
BIOL 398 or 399 – Biology Internship
Any 400- or 500- level Biology Course

Statistics Requirement can be fulfilled* by:

BIOL 315 – Biostatistics (S)
MATH 215 – Introductory Statistics (F,S)
STAT 205 – Essentials of Statistics (F,S)

** Students are encouraged to check with relevant professional schools to verify mathematics and statistics entrance requirements.*

Notes:

BIOL 212 Developmental Biology is recommended.
Consider undergraduate research.
Job Shadow during summer after freshman and sophomore years.
Prepare for graduate school entrance exams during summer after junior year.
MATH 205 is recommend over BIOL 315 for students that will apply to schools that require two semesters of college mathematics.
MATH 122 (taken as free elective) is required for PHYS 121

BI-PPRO+ (Doctor of Optometry from PCO at Salus University)
3+4 Accelerated Program – B.S.

Phase I (at Saint Francis University)

	FALL			SPRING	
			First Year		
Course No.	**Description**	**Cr.**	**Course No.**	**Description**	**Cr.**
BIOL 110	Evolution, Ecol., & Plant Bio.	4	BIOL 111	Molecules, Cells, & Anim. Phys	4
CHEM 101	Chemistry Principles I & lab	4	CHEM 102	Chemistry Principles II & lab	4
MATH 121	Calculus/Geom I		MATH 122	Calculus/Geom II	
Or 111	Finite Math	3	or 112	Calculus	3
ENGL 103	Writing for Discipline	3	HIST XXX	History Elective	3
RLST 105/205	Franciscan Goals Today or Faith/Franciscanism	3	CORE 113	Gen Ed 1st Year Seminar	3
CORE 103	Fall Comm. Enrich. Series	0	CORE 104	Spring Comm. Enrich. Series	0
BIOL 131	Biol Freshman Seminar	0			
Total Credits		**17**	**Total Credits**		**17**

****In the Sophomore year, students will need to apply in January to appear before the Pre-professional committee. Summer before /early fall of Junior year, application for admission to the PA College of Optometry at Salus University must be completed. See your advisor about completing your Career Statement and resume**.

			Second Year		
BIOL 211	Comp Vert Anat & lab	4	BIOL 406	Vert Physiology & lab	4
CHEM 201	Organic Chemistry I & lab	4	CHEM 202	Organic Chemistry II & lab	4
ENG 104	Intro to Literature	3	PSYCH 101	Intro to Psychology	3
PHIL 205	Reason and Responsibility	3	PHIL 312	Health Care Ethics	3
GETM III	Div & Comm Outer Core (III)	3	FNAR XXX	Fine Arts Elective	3
CORE 211	Personal Wellness	0	CORE 212	Comm. & Global Wellness	0
			BIOL 231	Biol Sophomore Seminar	0
Total Credits		**17**	**Total Credits**		**17**
			Third Year		
BIOL 301	Genetics & lab	4	BIOL 302	Gen Microbiology & lab	4
PHYS 104	Intro to Physics I & lab	4	PHYS 105	Intro to Physics II & lab	4
or 121	Gen Physics I & lab		or 122	Gen Physics II & lab	
BIOL 401	Cell & Mol Bio & lab	4	GETM IV	Soc Sys Outer Core (IV)*	3
SOC SCI	Elective	3	BIOL 405	Biochemistry	3
BIOL 331	Biology Junior Seminar	0	STAT 205	Essentials of Statistics	3
EXAM 301	Writing Competency	0	CORE 407	Keystone Seminar	3
LANG XXX	Foreign Lang. (102 or higher)	3			
Total Credits		**18**	**Total Credits**		**17**

Phase II is completed at Salus University. After successfully completing the first year of Phase II, students receive their B.S. from Saint Francis University.

Note: Sequence of courses may be altered with advisor's approval. It is suggested that some courses be taken during a summer session.

* Suggestions for courses in Gen Ed Them Minor IV, include: PSYC 201, 302. 305, 314

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BI-LCPH (B.S. + PharmD from Lake Erie College of Osteopathic Medicine)
3+3 or 3+4 Accelerated Program

Phase I (at Saint Francis University) - students must notify the Biology Dept chair of their intent to participate in this agreement upon entry into SFU

	FALL			SPRING	
			First Year		
Course No.	**Description**	**Cr.**	**Course No.**	**Description**	**Cr.**
BIOL 110	Evolution, Ecol., & Plant Bio.	4	BIOL 111	Molecules, Cells, & Anim. Phys	4
CHEM 101	Chemistry Principles I & lab	4	CHEM 102	Chemistry Principles II & lab	4
MATH 121	Calculus/Geom I		STAT 205	Essentials of Statistics	3
Or 111	Finite Math	3			
ENGL 103	Writing for Discipline	3	HIST XXX	History Elective	3
RLST 105/205	Franciscan Goals Today or Faith/Franciscanism	3	CORE 113	Gen Ed 1st Year Seminar	3
CORE 103	Fall Comm. Enrich. Series	0	CORE 104	Spring Comm. Enrich. Series	0
BIOL 131	Biol Freshman Seminar	0			
Total Credits		**17**	**Total Credits**		**17**

****In the Sophomore year, students will need to apply in January to appear before the Pre-professional committee. Summer before /early fall of Junior year, application for admission to the LECOM School of Pharmacy must be completed. See your advisor about completing your Career Statement and resume. If part of the agreement, you should already have received an interview at LECOM and would not be required to take the PCAT.**

			Second Year		
BIOL 211	Comp Vert Anat & lab	4	BIOL 406	Vert Physiology & lab	4
CHEM 201	Organic Chemistry I & lab	4	CHEM 202	Organic Chemistry II & lab	4
ENG 104	Intro to Literature	3	PSYCH 101*	Intro to Psychology	3
PHIL 205	Reason and Responsibility	3	PHIL 312	Health Care Ethics	3
GETM III	Div & Comm Outer Core (III)	3	FNAR XXX	Fine Arts Elective	3
CORE 211	Personal Wellness	0	CORE 124	Comm. & Global Wellness	0
			BIOL 231	Biol Sophomore Seminar	0
Total Credits		**17**	**Total Credits**		**17**
			Third Year		
BIOL 301	Genetics & lab	4	BIOL 302	Gen Microbiology & lab	4
PHYS 104	Intro to Physics I & lab	4	PHYS 105	Intro to Physics II & lab	4
or 121	Gen Physics I & lab		or 122	Gen Physics II & lab	
BIOL 401	Cell & Mol Bio & lab	4	GETM IV	Soc Sys Outer Core (IV)*	3
SOC SCI*	Elective	3	BIOL 405	Biochemistry	3
BIOL 331	Biology Junior Seminar	0			
EXAM 301	Writing Competency	0	CORE 407	Keystone Seminar	3
LANG XXX	Foreign Lang. (102 or higher)	3			
Total Credits		**18**	**Total Credits**		**17**

Phase II is completed at LECOM. After successfully completing the first year of Phase II, students receive their B.S. from Saint Francis University.

Note: Sequence of courses may be altered with advisor's approval.
* Economics is required and either PSYC 101 or Sociology as the second social science elective

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2+3/2+4 Pharm.D. Program in Pharmacy at LECOM
(no degree from SFU)

Phase I (at Saint Francis University)

FALL			SPRING		
First Year					
Course No.	**Description**	**Cr.**	**Course No.**	**Description**	**Cr.**
BIOL 110	Evolution, Ecol., & Plant Biol.	4	BIOL 111	Molecules, Cells, & Anim Phys	4
CHEM 101	Chemistry Principles I & lab	4	CHEM 102	Chemistry Principles II & lab	4
MATH 112	Calculus	3	STAT 205	Essentials of statistics	
ENGL 103	Writing for Discipline	3	HIST XXX	History Elective	3
RLST 105/205	Franciscan Goals Today or Faith/Franciscanism	3	CORE 113	Gen Ed 1st Year Seminar	3
CORE 103	Fall Comm. Enrich. Series	0	CORE 104	Spring Comm. Enrich. Series	0
BIOL 131	Biol Freshman Seminar	0			
Total Credits		**17**	**Total Credits**		**17**
Second Year					
PHYS 104	Intro to Physics I & lab	4			
or 121	Gen Physics I & lab		ECON 101	Principles of Ecomomics	3
CHEM 201	Organic Chemistry I & lab	4	CHEM 202	Organic Chemistry II & lab	4
ENG 104	Intro to Literature	3		Gen Ed Elective*	3
PHIL 205	Reason and Responsibility	3	PHIL 312	Health Care Ethics	3
PSYC 101	Introduction to Psychology		FNAR XXX	Fine Arts Elective	3
Or SOC 101	Introduction to Sociology	3	BIOL 231	Biol Sophomore Seminar	0
CORE 211	Personal Wellness	0	CORE 124	Comm. & Glob Wellness	0
Total Credits		**17**	**Total Credits**		**16**

Phase II is completed at LECOM. Upon completion of Phase II the student will receive the Pharm.D. from LECOM but receives no degree from SFU.

Note: Sequence of courses may be altered with advisor's approval.
* This needs to be a non-science & non-math course

POD (BIOLOGY- 3+4 PODIATRY PROGRAM – B.S.)

Bachelor of Science, Biology, 3+4 Podiatry Program (POD)

****Sequence of courses may be altered with consent of advisor.*

Course No.	Description	Cr.	Course No.	Description	Cr.
First Year	**Fall**		**First Year**	**Spring**	
□ BIOL 110	Evolution, Ecol, & Plant Biol.	4	□ BIOL 111	Molecules, Cells, & Anim. Phys.	4
□ CHEM 101	Chemistry Principles I	4	□ CHEM 102	Chemistry Principles II	4
□ MATH 121	Calculus/Geom I	3	□ MATH 121	Calculus/Geom II	3
or MATH	Finite Mathematics		or MATH	Calculus	
□ ENGL 103	Writing for Discipline	3	□ RLST 105	Francis and Global Issues	3
□ HIST xxx	History Elective	3	□ CORE 113	Gen Ed 1st Year Seminar	3
□ CORE 103	Fall Comm. Enrich. Series	0	□ CORE 104	Spring Comm. Enrich. Series	0
□ BIOL 131	Biology Freshman Seminar	0			
Total Credits		**17**	**Total Credits**		**17**
Second Year	**Fall**		**Second Year**	**Spring**	
□ BIOL 211	Comp. Vertebrate Anat.	4	□ BIOL 406	Vertebrate Physiology	4
□ CHEM 201	Organic Chemistry I	4	□ CHEM 202	Organic Chemistry II	4
□ ENGL 104	Intro to Literature	3	□ PSYC 101	Introduction to Psychology	3
□ PHIL 205	Reason and Responsibility	3	□ PHIL 312	Health Care Ethics	3
□ GETM III	Div & Comm Outer Core (III)	3	□ FNAR xxx	Fine Arts Elective	3
□ CORE 211	Personal Wellness	0	□ CORE 212	Community & Global Wellness	0
			□ BIOL 231	Biology Sophomore Seminar	0
Total Credits		**17**	**Total Credits**		**17**
Third Year	**Fall**		**Third Year**	**Spring**	
□ BIOL 301	Genetics & lab	4	□ BIOL 302	General Microbiology	4
□ PHYS 104	Intro to Physics I	4	□ PHYS 105	Intro to Physics II	4
or 121	Gen. Physics I		or 122	Gen. Physics II	
□ BIOL 401	Cell & Molecular Biology	4	□ GETM IV	Soc Sys Outer Core (IV)	3
□ SOC SCI	Elective	3	□ BIOL 405	Biochemistry	3
□ BIOL 331	Biology Junior Seminar	0	□ STAT 205	Essentials of Statistics	3
□ EXAM 301	Writing Competency	0	or MATH	Introductory Statistics	
□ LANG xxx	Foreign Lang. (102 or higher)	3	□ CORE 407	Keystone Seminar	3
Total Credits		**18**	**Total Credits**		**17**

The Senior Year will be completed at the Pennsylvania College of Podiatric Medicine. BS degree received from Saint Francis University upon successful completion of 1st year of Podiatry program.

Notes:

In the Sophomore year, students will need to
Apply in January to appear before the
Pre-Professional Recommendation
Committee and prepare to take the MCAT
exam in April.
In the Fall of Junior year, application for
admission to the PA College of Podiatric
Medicine must be completed. See your
advisor about completing your Career
Statement and resume.
Consider undergraduate research.
Job Shadow during summer after freshman
and sophomore years.

BIEN (BIOLOGY- ENVIRONMENTAL SCIENCE CONCENTRATION – B.S.)

Bachelor of Science, Biology: Environmental Science Concentration (BIEN)							****Sequence of courses may be altered with consent of advisor.*
Course No.	**Description**	**Cr.**	**Course No.**	**Description**	**Cr.**		**Organismal Biology Cluster Courses**
First Year	**Fall**		**First Year**	**Spring**			F = Fall; S = Spring; Su = Summer; AN = As Needed
□ BIOL 110	Evolution, Ecol, & Plant Biol.	4	□ BIOL 111	Molecules, Cells, & Anim. Phys.	4		*At least 1 course is required from the Organismal*
□ CHEM 101	Chemistry Principles I	4	□ CHEM 102	Chemistry Principles II	4		*Biology cluster. The Ecology and Molecules/Cells*
□ MATH 111	Finite Math	3	□ MATH 112	Calculus	3		*clusters are satisfied by required courses.*
or MATH121	Calculus/Geom I		or MATH 122	Calculus/Geom II			BIOL 204 – Invertebrate Zoology (F)
□ ENGL 103	Writing for Discipline	3	□ RLST 105	Francis and Global Issues	3		BIOL 211 – Comparative Anatomy (F)
□ HIST xxx	History Elective	3	□ CORE 113	Gen Ed 1st Year Seminar	3		BIOL 212 – Developmental Biology (S)
□ CORE 103	Fall Comm. Enrich. Series	0	□ CORE 104	Spring Comm. Enrich. Series	0		BIOL 218 – Marine Biology (S)
□ BIOL 131	Biology Freshman Seminar	0					BIOL 306 – Animal Nutrition (F)
Total Credits		**17**	**Total Credits**		**17**		BIOL 403 – Advanced Botany (F)
							BIOL 406 – Vertebrate Physiology (S)
Second Year	**Fall**		**Second Year**	**Spring**			
□ BIOL 203	Ecology	4	□ BIOL xxx	Biology Elective or Cluster	3-4		**Environmental Science Elective Courses**
□ CHEM 201	Organic Chemistry I	4	□ CHEM 202	Organic Chemistry II	4		*At least 8 credits from the following:*
□ ENGL 104	Intro to Literature	3	□ PSYC 101	Introduction to Psychology	3		Any of the cluster courses above
□ PHIL 205	Reason and Responsibility	3	□ GETM III	Div & Comm Outer Core (III)	3		BIOL 208 – Animal Behavior (F)
□ GETM I	Ethics Outer Core (I)	3	□ FNAR xxx	Fine Arts Elective	3		BIOL 220 – Conservation Biology (S)
□ CORE 211	Personal Wellness	0	□ CORE 212	Community & Global Wellness	0		BIOL 320 – Nat History of the Vertebrates (S)
			□ BIOL 231	Biology Sophomore Seminar	0		BIOL 322 – Field Biology (S)
Total Credits		**17**	**Total Credits**		**16-17**		BIOL 326 – Freshwater Aquatic Biology (F)
							CHEM 205 – Environmental Chemistry (F)
Third Year	**Fall**		**Third Year**	**Spring**			Any 400 or higher Biology course
□ BIOL 301	Genetics	4	□ BIOL 302	General Microbiology	4		BIOL 420-424 – Biology Research
□ PHYS 104	Intro to Physics I	4	□ PHYS 105	Intro to Physics II	4		
or 121	Gen. Physics I		or 122	Gen. Physics II			***Statistics Requirement can be fulfilled by:***
□ LANG xxx	Foreign Lang. (102 or higher)	3	□ GETM IV	Soc Sys Outer Core (IV)	3		BIOL 315 – Biostatistics (S)
□ SOC 102	American Society/Problems	3	□ PLSC 102	American National Government	3		MATH 215 – Introductory Statistics (F,S)
□ ECON 101	Principles of Economics I	3	□ Statistics	Statistics Course (see note)	3-4		STAT 205 – Essentials of Statistics (F,S)
□ BIOL 331	Biology Junior Seminar	0					
□ EXAM 301	Writing Competency	0					***Suggestions:***
Total Credits		**17**	**Total Credits**		**17-18**		Consider undergraduate research
							Job Shadow during summer after freshman
Fourth Year	**Fall**		**Fourth Year**	**Spring**			and sophomore years.
□ BIOL xxx	Biology Elective or Cluster	3-4	□ BIOL 402	Evolution	3		If pursuing graduate school, prepare for
□ BIOL xxx	Biology Elective or Cluster	3-4	□ BIOL 431	Biology Senior Seminar	1		graduate school entrance exams during
□ MGMT101	Principles of Management	3	□ BIOL 408	Environmental Problems	4		summer after junior year.
□	Free Elective	3	□	Free Elective	3		
			□ CORE 407	Keystone Seminar	3		
			□ EXAM 401	Dept. Comp. Exam	0		
Total Credits		**13-14**	**Total Credits**		**14**		

BI-M (BIOLOGY - MARINE BIOLOGY CONCENTRATION – B.S.)

Bachelor of Science, Biology – Marine Biology Concentration (BI-M)							****Sequence of courses may be altered with consent of advisor.*
Course No.	**Description**	**Cr.**	**Course No.**	**Description**	**Cr.**		***Biology Course Options:***
First Year	**Fall**		**First Year**	**Spring**			*Choose two of the following:*
□ BIOL 110	Evolution, Ecol, & Plant Biol.	4	□ BIOL 111	Molecules, Cells, & Anim. Phys.	4		BIOL 203 – Ecology (F)
□ CHEM 101	Chemistry Principles I	4	□ CHEM	Chemistry Principles II	4		BIOL 204 – Invertebrate Zoology (AN)
□ ENGL 103	Writing for Discipline	3	□ LANG xxx	Foreign Lang. (102 or higher)	3		BIOL 211 – Comparative Vertebrate Anatomy (F)
□ RLST 105	Francis and Global Issues	3	□ CORE 113	Gen Ed 1st Year Seminar	3		BIOL 320 – Natural History of Vertebrates (AN)
□ PSYC 101	Introduction to Psychology	3	□ HIST xxx	History Elective	3		BIOL 401 – Cell & Molecular Biology (F)
□ BIOL 131	Biology Freshman Seminar	0	□ CORE 104	Spring Comm. Enrich. Series	0		***Marine Biology Electives:***
□ CORE 103	Fall Comm. Enrich. Series	0					*8-9 credits of the following:*
							BIOL 312 – Research Diver Techniques
Total Credits		**17**	**Total**		**17**		BIOL 322 – Field Biology
							BIOL 398 – Biology Internship
Second Year	**Fall**		**Second Year**	**Spring**			BIOL 399 – Biology Internship
□ BIOL xxx	Biology Course Option I	4	□ BIOL 218	Marine Biology	4		Summer courses from the Marine Consortium:
□ CHEM 201	Organic Chemistry I	4	□ CHEM	Organic Chemistry II	4		MS-110 – Introduction to Oceanography
□ MATH 121	Calculus/Geom I	3	□ Statistics	Statistics Course (see note)	3-4		MS-211 – Field Methods in Oceanography
or MATH	Calculus		□ ENGL 104	Intro to Literature	3		MS-221 – Marine Invertebrates
□ PHIL 205	Reason and Responsibility	3	□ GETM III	Div & Comm Outer Core (III)	3		MS-241 – Marine Biology
□ GETM IV	Soc Sys Outer Core (IV)	3	□ CORE 212	Community & Global Wellness	0		MS-260 – Marine Ecology
□ CORE 211	Personal Wellness	0	□ BIOL 231	Biology Sophomore Seminar	0		MS-300 – Behavior of Marine Organisms
							MS-331 – Chemical Oceanography
Total Credits		**17**	**Total**		**17-18**		MS-343 – Marine Ichthyology
							MS-345 – Marine Ornithology
Third Year	**Fall**		**Third Year**	**Spring**			MS-451 – Coastal Environment Oceanography
□ BIOL 301	Genetics	4	□ BIOL 302	General Microbiology	4		MS-464 – Biological Oceanography
□ PHYS 104	Intro to Physics I	4	□ BIOL xxx	Marine Biology Elective	1-4		MS-471 – Research Diver Techniques
or 121	Gen. Physics I		□ PHYS 105	Intro to Physics II	4		MS-490 – Aquaculture
□ FNAR xxx	Fine Arts Elective	3	or 122	Gen. Physics II			MS-491 – Coral Reef Ecology
□ SOC SCI	Social Sciences Inner Core	3	□ GETM I	Ethics Outer Core (I)	3		MS-500 – Problems in Marine Science
□ BIOL 331	Biology Junior Seminar	0	□	Free Elective	3		***Statistics Requirement can be fulfilled by:***
□ EXAM 301	Writing Competency	0					BIOL 315 – Biostatistics (S)
Total Credits		**17**	**Total**		**15-18**		MATH 215 – Introductory Statistics (F,S)
							STAT 205 – Essentials of Statistics (F,S)
Fourth Year	**Fall**		**Fourth Year**	**Spring**			***Suggestions:***
□ BIOL xxx	Biology Course Option II	4	□ BIOL 402	Evolution	3		Consider undergraduate research and
□ BIOL xxx	Marine Biology Elective	1-4	□ BIOL 431	Biology Senior Seminar	1		internships.
□ GETM II	Science & Quant (if needed)	3	□ BIOL xxx	Marine Biology Elective	3-4		If pursuing graduate school, prepare for
□	Free Elective	3	□	Free Elective	3		graduate school entrance exams during
□ CORE 407	Keystone Seminar	3	□	Free Elective	3		summer after junior year.
			□ EXAM 401	Dept. Comp. Exam	0		SOC 305 – Environmental Sociology is
Total Credits		**14-17**	**Total**		**13-14**		recommended for GETM IV.

BICH (BIOLOGY – BIOCHEMISTRY CONCENTRATION – B.S.)

Bachelor of Science, Biology – Biochemistry Concentration							****Sequence of courses may be altered with consent of advisor.*
Course No.	**Description**	**Cr.**	**Course No.**	**Description**	**Cr.**		
First Year	**Fall**		**First Year**	**Spring**			***Biochemistry Program Electives***
□ BIOL 110	Evolution, Ecol, & Plant Biol.	4	□ BIOL 111	Molecules, Cells, & Anim. Phys.	4		BIOL 398/399 – Biology Internship
□ MATH 121	Calculus/Geom I	3	□ Statistics	Statistics Course (see note)	3-4		BIOL 412-416 – Special Topics in Biology
□ SOC SCI	Elective	3	□ SOC SCI	Elective	3		BIOL 420-424 – Research
□ ENGL 103	Writing for Discipline	3	□ RLST 105	Francis and Global Issues	3		BIOL 430 – Advanced Laboratory Methods in Molecular Biology
□ HIST xxx	History Elective	3	□ CORE 113	Gen Ed 1st Year Seminar	3		
□ CORE 103	Fall Comm. Enrich. Series	0	□ CORE 104	Spring Comm. Enrich. Series	0		
□ BIOL 131	Biology Freshman Seminar	0					
							Statistics Requirement can be fulfilled by:
Total Credits		**16**	**Total Credits**		**16-17**		BIOL 315 – Biostatistics (S)
							MATH 215 – Introductory Statistics (F,S)
Second Year	**Fall**		**Second Year**	**Spring**			STAT 205 – Essentials of Statistics (F,S)
□ BIOL 301	Genetics	4	□ BIOL 302	General Microbiology	4		
□ CHEM 101	Chemistry Principles I	4	□ CHEM 102	Chemistry Principles II	4		
□ ENGL 104	Intro to Literature	3	□ GETM III	Div & Comm Outer Core (III)	3		
□ PHIL 205	Reason and Responsibility	3	□ FNAR xxx	Fine Arts Elective	3		***Suggestions:***
□	Free Elective	3	□	Free Elective	3		Consider undergraduate research
□ CORE 211	Personal Wellness	0	□ CORE 212	Community & Global Wellness	0		Job Shadow during summer after freshman and sophomore years.
			□ BIOL 231	Biology Sophomore Seminar	0		
Total Credits		**17**	**Total Credits**		**17**		If pursuing graduate school, prepare for graduate school entrance exams during summer after junior year.
Third Year	**Fall**		**Third Year**	**Spring**			
□ BIOL 401	Cell & Molecular Biology	4	□ BIOL 406	Vertebrate Physiology	4		
□ CHEM 201	Organic Chemistry I	4	□ BIOL 405	Biochemistry	3		
□ LANG xxx	Foreign Lang. (102 or higher)	3	□ CHEM 202	Organic Chemistry II	4		
□ GETM IV	Soc Sys Outer Core (IV)	3	□ GETM I	Ethics Outer Core (I)	3		
□ BIOL xxx	Biochemistry Prog. Elective	2	□	Free Elective	3		
□ BIOL 331	Biology Junior Seminar	0					
□ EXAM 301	Writing Competency	0					
Total Credits		**16**	**Total Credits**		**17**		
Fourth Year	**Fall**		**Fourth Year**	**Spring**			
□ CHEM 301	Physical Chemistry	4	□ BIOL 402	Evolution	3		
□ PHYS 104	Intro to Physics I	4	□ BIOL 431	Biology Senior Seminar	1		
or 121	Gen. Physics I		□ PHYS 105	Intro to Physics II or	4		
□ GETM II	Science & Quant (if needed)	3	or 122	Gen Physics II			
□	Free Elective	3	□ CORE 407	Keystone Seminar	0		
□	Free Elective	2	□ EXAM 401	Dept. Comp. Exam	0		
			□	Free Electives	4		
Total Credits		**16**	**Total Credits**		**12**		

BIMG (BIOLOGY – MOLECULAR BIOLOGY CONCENTRATION – B.S.)

Bachelor of Science, Biology: Molecular Biology Concentration							****Sequence of courses may be altered with consent of advisor.*
Course No.	**Description**	**Cr.**	**Course No.**	**Description**	**Cr.**		**Biology Clusters**
First Year	**Fall**		**First Year**	**Spring**			F = Fall; S = Spring; Su = Summer; AN = As Needed
□ BIOL 110	Evolution, Ecol, & Plant Biol.	4	□ BIOL 111	Molecules, Cells, & Anim. Phys.	4		*At least 1 course is required from each cluster.*
□ CHEM 101	Chemistry Principles I	4	□ CHEM 102	Chemistry Principles II	4		Ecology Cluster
□ MATH 121	Calculus/Geom I	3	□	Mathematics Elective (see note)	3-4		BIOL 203 – Ecology (F)
□ ENGL 103	Writing for Discipline	3	□ RLST 105	Francis and Global Issues	3		BIOL 208 – Animal Behavior (F)
□ HIST xxx	History Elective	3	□ CORE 113	Gen Ed 1st Year Seminar	3		BIOL 220 – Conservation Biology (S)
□ CORE 103	Fall Comm. Enrich. Series	0	□ CORE 104	Spring Comm. Enrich. Series	0		BIOL 320 – Natural History of Vertebrates (AN)
□ BIOL 131	Biology Freshman Seminar	0					BIOL 322 – Field Biology (S,Su)
							BIOL 326 – Freshwater Aquatic Biology (F)
Total Credits		**17**	**Total Credits**		**17-18**		Organismal Biology Cluster
							BIOL 204 – Invertebrate Zoology (F)
Second Year	**Fall**		**Second Year**	**Spring**			BIOL 211 – Comparative Anatomy (F)
□ BIOL 301	Genetics & lab	4	□ BIOL 302	General Microbiology	4		BIOL 212 – Developmental Biology (S)
□ CHEM 201	Organic Chemistry I	4	□ CHEM 202	Organic Chemistry II	4		BIOL 218 – Marine Biology (S)
□ ENGL 104	Intro to Literature	3	□ SOC SCI	Elective	3		BIOL 306 – Animal Nutrition (F)
□ PHIL 205	Reason and Responsibility	3	□ GETM III	Div & Comm Outer Core (III)	3		BIOL 403 – Advanced Botany (F)
□ GETM I	Ethics Outer Core (I)	3	□ FNAR xxx	Fine Arts Elective	3		BIOL 406 – Vertebrate Physiology (S)
□ CORE 211	Personal Wellness	0	□ CORE 212	Community & Global Wellness	0		***Molecular Biology Electives***
			□ BIOL 231	Biology Sophomore Seminar	0		BIOL212 – Developmental Biology (if not taken
Total Credits		**17**	**Total Credits**		**17**		to fill cluster requirement)
							BIOL305 – Immunology
Third Year	**Fall**		**Third Year**	**Spring**			BIOL398-399 – Biology Internship
□ BIOL 401	Cell & Molecular Biology	4	□ BIOL 405	Biochemistry	4		BIOL412-416 Special Topic. Biol. (with approval)
□ PHYS 104	Intro to Physics I	4	□ BIOL xxx	Biology Cluster Course	3-4		BIOL420-424 Research
or 121	Gen. Physics I		□ PHYS 105	Intro to Physics II	4		NEUR279 – Introduction to Neuroscience
□ LANG xxx	Foreign Lang. (102 or higher)	3	or 122	Gen. Physics II			CPSC121 – Introduction to Programming
□ SOC SCI	Elective	3	□ GETM IV	Soc Sys Outer Core (IV)	3		CPSC122 – Intermediate Programming
□	Free Elective	3	□	Free Elective	3		CPSC250 – Bioinformatics Programming
□ BIOL 331	Biology Junior Seminar	0					CHEM301 – Physical Chemistry I
□ EXAM 301	Writing Competency	0					CHEM302 – Physical Chemistry II
Total Credits		**17**	**Total Credits**		**17-18**		CHEM404 – Bioorganic Chemistry
							Mathematics Elective
Fourth Year	**Fall**		**Fourth Year**	**Spring**			BIOL 315 – Biostatistics (S)
□ BIOL xxx	Biology Cluster Course	3-4	□ BIOL 402	Evolution	3		MATH 130 – Discrete Mathematics (S)
□ BIOL/CHEM/	Molecular Biology Elective	3-4	□ BIOL 431	Biology Senior Seminar	1		MATH 215 – Introductory Statistics (F,S)
CPSC/NEUR			□ BIOL 430	Adv. Molecular Methods	2		STAT 205 – Essentials of Statistics (F,S)
□	Free Elective	3	□	Free Elective	3		Consider undergraduate research
□	Free Elective	3	□ CORE 407	Keystone Seminar	3		If pursuing graduate school, prep for entrance
			□ EXAM 401	Dept. Comp. Exam	0		exams during summer after junior year.
Total Credits		**12-14**	**Total Credits**		**12**		Upper-level CHEM classes may req. MATH 122.

MEDT (MEDICAL LABORATORY SCIENCE/TECHNOLOGY – B.S.)

Medical Laboratory Science / Medical Technology, B.S. (MEDT)							****Sequence of courses may be altered with consent of advisor.*
Course No.	**Description**	**Cr.**		**Course No.**	**Description**	**Cr.**	
First Year	**Fall**			**First Year**	**Spring**		***Suggestions:***
□ BIOL 111	Molecules, Cells, & Anim.	4		□ CHEM 102	Chemistry Principles II	4	Consider undergraduate research
□ CHEM 101	Chemistry Principles I	4		□ MATH 121	Calculus/Geom I	3	Job Shadow during summer
□ ENGL 103	Writing for Discipline	3		or 112	Calculus		
□ HIST xxx	History Elective	3		□ SOC SCI	Elective	3	
□ CORE 103	Fall Comm. Enrich. Series	0		□ RLST 105	Francis and Global Issues	3	
□ BIOL 131	Biology Freshman Seminar	0		□ CORE 113	Gen Ed 1st Year Seminar	3	
				□ CORE 104	Spring Comm. Enrich. Series	0	
Total Credits		**14**		**Total Credits**		**16**	
Second Year	**Fall**			**Second Year**	**Spring**		
□ BIOL 205	Human A & P with Lab	4		□ BIOL 206	Human A & P with Lab	4	
□ BIOL 214	Clinical Microbiology	4		□ CHEM 202	Organic Chemistry II	4	
□ CHEM 201	Organic Chemistry I	4		□ GETM I	Ethics Outer Core (I)*	3	* **PHIL 312 Health Care Ethics** is recommended for
□ PHIL 205	Reason and Responsibility	3		□ ENGL 104	Intro to Literature	3	the GETM I Ethics Outer Core elective.
□ CORE 211	Personal Wellness	0		□ LANG xxx	Foreign Lang. (102 or higher)	3	
				□ CORE 212	Global & Community Wellness	0	
				□ BIOL 231	Biology Sophomore Seminar	0	
Total Credits		**15**		**Total Credits**		**17**	
Third Year	**Fall**			**Third Year**	**Spring**		
□ BIOL 301	Genetics	4		□ BIOL 305	Immunology	3	**Note:** MATH 122 is required for PHYS 121.
□ PHYS 104	Intro to Physics I & Lab	4		□ SOC SCI	Elective	3	
or 121	Gen. Physics I			□ Statistics	Statistics Course (see note)	3-4	***Statistics Requirement can be fulfilled by:***
□ GETM III	Div & Comm Outer Core (III)	3		□ GETM IV	Soc Sys Outer Core (IV)	3	BIOL 315 – Biostatistics (S)
□ CORE 407	Keystone Seminar	3		□ FNAR xxx	Fine Arts Elective	3	STAT 205 – Essentials of Statistics (F,S)
□	Free Elective	3		□ EXAM 401	Dept. Comp. Exam	0	MATH 215 – Introductory Statistics (F,S)
□ BIOL 331	Biology Junior Seminar	0					
□ EXAM 301	Writing Competency	0					
Total Credits		**17**		**Total Credits**		**15-16**	
Fourth Year							
Qualified students will transfer to a hospital with a CAHEAA-Accredited School of Medical Technology for their senior year. The student earns 32 credits in courses such as clinical chemistry, immunology, bacteriology, etc., which are included in the determination of the student's final quality point average (QPA).							
After successful completion of this year, the student will receive their B.S. degree from Saint Francis University.							Revised 8/15

BACHELOR OF ARTS IN AQUARIUM AND ZOO SCIENCE

FALL **SPRING**

FRESHMAN

Course No.	Description	Cr.	Course No.	Description	Cr.
BIOL 110	Evol., Ecol., & Plant Bio.	4	BIOL 111	Molecules, Cells, & Animal Phys.	4
ENGL 103	Writing for Disc		ENGL 104	Writing about Lit	
Or 104	Writing about Lit	3	Or 103	Writing for Disc	3
*RLST 105	Franciscan Goals Today		CORE 113	First Year Seminar	
Or CORE 113	First Year Seminar	3	Or RLST 105*	Franciscan Goals Today	3
MATH 111	Finite Math	3	PSYC 101	Intro to Psychology	3
SOC SCI	Elective	3	HIST XXX	Any 100 or 200 level course	3
CORE 103	Fall Convocation	0	CORE 104	Spring Convocation	0
BIOL 131	Freshman Seminar	0			
Total No. of Credits		**16**	**Total No. of Credits**		**16**

SOPHOMORE

BIOL 208	Animal Behavior	4	BIOL 218	Marine Biology	4
BIOL 204	Invertebrate Zoology	4	BIOL 320	Natural Hist. Vertebrates	4
PHIL 205	Phil-Reason/Response	3	FNAR	Fine Arts Elective	3
Or FNAR	Fine Arts Elective		Or PHIL 205	Phil-Reason/Response	
SPCH 103	Speech	3	PSYC XXX	Psychology Choice	3
PSYC XXX	Psychology Choice	3	CHEM 105	meets Outer Core Elective	3
CORE 211	Personal Wellness	0	CORE 212	Comm & Global Wellness	0
			BIOL 231	Sophomore Seminar	0
Total No. of Credits		**17**	**Total No. of Credits**		**17**

JUNIOR

BIOL 307	Animal Care	4	BIOL 308	Animal Care/Training Practicum	2
BIOL 306	Animal Nutrition	3	BIOL 302	Microbiology	4
GEN ED XXX	Outer Core Elective	3-4	GEN ED XXX	Inner Core Elective	3
(En. Ethics, En. Soc., or Ecology Recommended)			GEN ED XXX	Outer Core Elective	3
BIOL 331	Junior Seminar	0	(En. Studies or Field Biology Recommended)		
PSYC XXX	Psychology Choice	3	PSYC XXX	Psychology Choice	3
EXAM 301	Writing Comp. Exam	0			
Total No. of Credits		**13-14**	**Total No. of Credits**		**15**

Summer: Complete an internship at an aquarium or zoo (6 credits)

SENIOR

BIOL 301	Genetics	4	BIOL 402	Evolution	3
BIOL XXX	Elective	3-4	**BIOL 431	Senior Seminar	0-1
Or other elective of interest			BIOL XXX	Biology Elective	3-4
LANG 102+	Language	3	or other elective of interest		
STAT 101	Statistics	3	GEN ED XXX	Outer Core Elective	3
CORE 407	Keystone Seminar	3	PSCY XXX	Psychology Elective	3
			Comprehensive Exam 401		0
Total No. of Credits		**16-17**	**Total No. of Credits**		**12-14**

Note: Sequence of courses may be altered with advisor's approval.
*** RLST 105 or RLST 205 required for RLST requirement.**
****Seniors who have completed 388-389, 421-434 or 502 can register for 0 credits but must present their work to the class.**

Rev 8/14

GENERAL EDUCATION PROGRAM CHECKSHEET

General Education Requirements

FIRST YEAR

CORE 103 (0)	Fall Community Enrichment Series	ENGL 103 (3)	Writing for a Discipline
CORE 104 (0)	Spring Community Enrichment Series		*(linked to another course)*
CORE 113 (3)	First Year Seminar	RLST 105 (3)	Franciscan Goals for Today

SECOND YEAR

CORE 211 (0)	Personal Wellness	ENGL 104 (3)	Introduction to Literature
CORE 212 (0)	Community & Global Wellness	PHIL 205 (3)	Reasoning & Responsibility

FIRST OR SECOND YEAR

HIST 100-200 (3) Any History course 100-200 level (except HIST 201)
SCI 101 (3) Science for Active Citizenship or any natural science course with an associated lab, if the lab is also taken
MATH 101 or 105+ (3) General Mathematics or a math course numbered 105 or higher

SECOND or THIRD YEAR
(based on credits or enrollment)

EXAM 301 (0) Writing Competency Exam or ENGL 199 (3) Argumentative Writing *(grade of C or higher)*

Students with Junior status (based on # of credits) are automatically enrolled in the WCE unless they enroll in ENGL 199. Students who failed the WCE twice or who achieve Senior status without having passed the WCE are automatically enrolled in CORE 199, Writing Intensive Seminar, 0 credits, in order to prepare for the WCE.

ANY YEAR

Fine Arts (3)	Choose from ART, MUS, FNAR, or THTR	Language (3)	Numbered 102 or higher

Choose two Social Sciences from two <u>different</u> disciplines:

ECON 101 (3)	Principles of Economics	PSYC 101 (3)	Introduction to Psychology
PLSC 102 (3)	American National Government	SOC 100-200 (3)	Any Sociology 100-200 level
PLSC 103 (3)	World Politics *(or any 200-300 level political science with instructor's permission)*		

Choose a Thematic Minor (on back) or Open Program. Categories for courses taken are listed below:

Category I (3)	Ethics	Category II (3)	Science & Quant. Literacy
Category III (3)	Diversity & Communications	Category IV (3)	Social Systems
CORE 407 (3)	Keystone Seminar		

NOTE: Either Category I or III (or both) must be a PHIL or RLST 300 or higher course

General Education Thematic Minors or Open Program

1. Active Citizenship
The objective of this General Education Thematic Minor is to provide students with a theoretical understanding of the demands of citizenship, a knowledge base of contemporary global and national concerns, and opportunities for hands-on collaborative leadership and service.

2. Global Community
As humanity moves towards a new age of "globalism," we are confronted by environmental, economic, and political challenges that demand new ways of thinking about mankind and society. The objective of this thematic minor is to encourage students to think about global processes and institutions and how they might be re-conceptualized and restructured to foster a more cooperative approach to addressing humanity's future.

3. Science, Technology, and Society
This thematic minor will develop a narrative of how advances in science have resulted in technological changes that have sprung the evolution of society. From the early industries of the Paleolithic to the current digital revolution, technology and science have facilitated societal progress. This connection will be explored throughout the minor.

4. Servant Leadership
Servant Leadership is a philosophy and practice of leadership that focuses on the service component of leadership. Servant leaders devote themselves to serving the needs of others by investing in their development and well-being for the benefit of accomplishing tasks and goals for the common good. Rather than following a self-serving, domineering leadership style, servant leaders foster collaborative teams via respect, motivation, and a set of mutual values.

5. Social Justice and Peacemaking
The objective of this General Education Thematic Minor is to introduce students to the major issues surrounding social justice and peacemaking by having them explore the social, cultural, political, and economic conditions of the world's population.

6. Sustainability and the Environment
Humanity must embrace sustainability in all of our endeavors, not only to maintain life as we know it now, but also to ensure a healthy planet for future generations. This thematic minor will bring together multiple disciplines to build a working knowledge of the scientific and social problems involved in sustainability, allowing SFU students to better understand and pursue sustain-able solutions to world problems.

7. Utopian and Dystopian Visions
What would a perfect society be like? How distorted can human civilization become? Are we now contending with critical circumstances that will propel us toward and ideal society - or, alternatively, toward shocking degradation of human and natural systems? Utopian and Dystopian Visions will introduce students to literature and research, both classic and current, that debate the nature of human perfection, the definition of human wretchedness, and our potential for realizing either extreme.

8. Women, Family, and the Community
While other General Education Thematic Minors take a macro-approach to examining the issues and confronting humanity, the objective of this thematic minor is to take a micro-approach. Its goal is to examine how the demands of the various communities in which a woman lives - family, local community, university community, work community, etc. - both enhance and challenge the development of the individual and her personal fulfillment.

9. Open Program
Students will choose one course from each of the following categories - Ethics, Science and Quantitative Literacy, Diversity and Communications, Social Systems, and the CORE 407 Keystone Seminar.

BIOLOGY DEPARTMENT AFFILIATIONS

"3+4" & "4+4" EARLY ACCEPTANCE PROGRAMS IN MEDICINE – LAKE ERIE COLLEGE OF OSTEOPATHIC MEDICINE (LECOM)

The agreement establishes an Early Acceptance Program to which Saint Francis University undergraduate students are enrolled jointly by Saint Francis University and by LECOM. The Early Acceptance Program is designed to facilitate the admission of Saint Francis University students into LECOM's Doctor of Osteopathic Medicine Program. Under a joint agreement between the Lake Erie University of Osteopathic Medicine (LECOM) and SFU, undergraduate students who have successfully completed specific core course requirements at SFU may continue their education in medicine at LECOM in this program of study. The program is comprised of two tracks. The "4 + 4" track is the recommended track for most students. It is comprised of two phases. Phase I consists of four years of undergraduate education at Saint Francis University. Phase II consists of four years of medical education at LECOM. The "3 + 4" track is typically utilized by the highly motivated student. It is comprised of two phases. Phase I consists of three years of undergraduate education at Saint Francis University. Phase II consists of four years at LECOM.

Students will be admitted to the SFU Phase (Phase I) of the program based upon the following criteria:

SAT Scores	$\geq$ 1170 (or ACT score of at least 26)
High School GPA	3.5 on a scale of 4.0
Residency	U.S. citizen or permanent resident
Potential	Additional evidence of scholarly and professional potential and desire to become a primary care physician.

The SAT scores (1170) and high school GPA serve as targets for applicant selection for admission to the program; other parameters, such as personal traits and desire to become an osteopathic physician, will also be considered for each applicant.

SFU representatives will interview applicants to the program and submit acceptable applications for review to LECOM with a recommendation for provisional acceptance. LECOM will notify SFU within thirty (30) days of receipt of the application of provisional acceptance. Therefore, acceptance to Phase I of the program will be determined jointly by SFU and LECOM.

Students who are interested in pursuing the pre-professional studies program in Osteopathic Medicine should contact Dr. Marian Langer, Program Coordinator and Chair of the Biology Department.

LAKE ERIE COLLEGE OF OSTEOPATHIC MEDICINE | 814-866-6641 | 1858 W. GRANDVIEW BLVD. ERIE, PA

EARLY ACCEPTANCE PROGRAM

WHAT ARE THE **BENEFITS**?

- **Removes stress** of application process
- **Eliminates most costs** of applying to professional school
- **Secures** a future seat at LECOM
- **Personal Guidance** throughout undergraduate classes
- Learning Pathway **Preference** for the College of Medicine
- Can **Reduce Time and Tuition**

WHAT ARE THE **REQUIREMENTS**?

HIGH SCHOOL STUDENTS:

→ Meet minimum requirements
HS GPA ≥ 3.5
SAT ≥ 1170 *or* ACT ≥ 26
→ Apply during senior year
→ Complete interview @ LECOM
→ Enroll in an affiliated institution
Provisional acceptance offered
→ Maintain >3.4 Overall GPA
>3.2 Science GPA
→ Take required examinations
*MCAT ≥ 25
**PCAT not required
***DAT ≥ 18
→ Complete LECOM application
→ Transition to LECOM after undergraduate year 2, 3, or 4 depending on program

LECOM

COLLEGE STUDENTS:

→ Meet minimum requirements at time of applying:
Overall GPA ≥ 3.4
Science GPA ≥ 3.2
→ Apply through LECOM website
→ Complete an on-site interview
Provisional acceptance offered
→ Maintain ≥3.4 GPA
≥3.2 Science GPA
→ Take required examinations
*MCAT ≥ 25
**No PCAT required
***DAT ≥ 18
→ Complete LECOM application
→ Transition to LECOM after undergraduate year 2, 3, or 4 depending on program

**Medical College Admissions Test **Pharmacy College Admissions Test ***Dental Admissions Test*

WHAT'S **NEXT?**

Visit lecom.edu or https://portal.lecom.edu/ics or use your smartphone to scan the QR code for more information.

OR **Contact LECOM Admissions at 814-866-6641** for more information.

OR **Contact the pre-health advisor** at your affiliated undergraduate institution for more information.

"3+4" ACCELERATED PROGRAM LEADING TO THE BACCALAUREATE AND DOCTOR OF DENTAL MEDICINE DEGREES

Under a joint agreement between Kornberg School of Dentistry Temple University and Saint Francis University, select undergraduate students who have successfully completed specific core course requirements at SFU may continue their education in dentistry at Kornberg School Of Dentistry in this program of study. This accelerated academic program is referred to as *The "3+4" Accelerated Program Leading to the Baccalaureate and Doctor of Dental Medicine Degrees* (or Program). The Program is comprised of two phases: Phase I consists of the first three years of undergraduate education at Saint Francis; Phase II consists of the remaining four years of dental school education at Kornberg School of Dentistry. Saint Francis University will confer the Bachelor of Science (B.S.) degree to students who have successfully completed the first year of Kornberg School of Dentistry Temple University's academic curriculum.

For admission to the Program, students must complete the first 3-year phase of education at SFU. Following the successful completion of the ascribed undergraduate phase of training, students will continue with the second phase of their education under the auspices of Kornberg School of Dentistry Temple University and its associated clinical training sites.

Students will be admitted to the SFU Phase (Phase I) of the Program based upon the following criteria:

SAT Scores	1150 (re-centered)
Grade Point Average (High School GPA)	3.4
Class Rank	Top 25% of the class
Potential	Additional evidence of scholarly and professional potential and desire to practice dentistry

The SAT scores (1150) and high school GPA (3.4) serve as targets for applicant selection for admission to the Program; other parameters, such as personal traits, and desire to practice dentistry will also be considered for each applicant.

SFU representatives will interview applicants to the Program and submit acceptable Phase I applications to Kornberg School of Dentistry Temple University for review. KornbergSchool of Dentistry will acknowledge receipt of Phase I applications within thirty (30) days.

Students who are interested in pursuing the pre-professional studies program in Dental Medicine should contact Dr. Marian Langer, Program Coordinator and Chair of the Biology Department.

"3+4" ACCELERATED PROGRAM LEADING TO THE BACCALAUREATE AND DOCTOR OF OPTOMETRY DEGREES

Under a joint agreement between the Pennsylvania College of Optometry (PCO) at Salus University and Saint Francis University, select undergraduate students who have successfully completed specific core course requirements at SFU may continue their education in optometry at Salus University in this program of study. This accelerated academic program is referred to as *The "3+4" Accelerated Program Leading to the Baccalaureate and Doctor of Optometry Degrees* (or Program). The Program is comprised of two phases: Phase I consists of the first three years of undergraduate education at Saint Francis; Phase II consists of the remaining four years of optometry school education at Salus University. Saint Francis University will confer the Bachelor of Science (B.S.) degree to students who have successfully completed the first year of Salus University's academic curriculum.

For admission to the Program, students must complete the first 3-year phase of education at SFU. Following the successful completion of the ascribed undergraduate phase of training, students will continue with the second phase of their education under the auspices of Salus University and its associated clinical training sites.

Students will be admitted to the SFU Phase (Phase I) of the Program based upon the following criteria:

SAT Scores	1150 (re-centered)
Grade Point Average (High School GPA)	3.4
Class Rank	Top 25% of the class
Potential	Additional evidence of scholarly and professional potential and desire to practice optometry

The SAT scores (1150) and high school GPA (3.4) serve as targets for applicant selection for admission to the Program; other parameters, such as personal traits, and desire to practice optometry will also be considered for each applicant.

SFU representatives will interview applicants to the Program and submit acceptable Phase I applications to Salus University for review. Final acceptance of candidates to Phase II of the Program will be determined by Salus University.

Students who are interested in pursuing the pre-professional studies program in Optometry should contact Dr. Marian Langer, Program Coordinator and Chair of the Biology Department.

"2 + 3/2+4" (PharmD) ACCELERATED PROGRAM IN PHARMACY - THE LAKE ERIE COLLEGE OF OSTEOPATHIC MEDICINE SCHOOL OF PHARMACY

The *Program* is an early-entry pre-pharmacy program that will give students the opportunity to complete their pharmacy education in two phases: Phase I consists of the first two years of undergraduate education at Saint Francis; and Phase II consists of the remaining three years of pharmacy education at LECOM's Erie campus (or the remaining four years at LECOM's Bradenton, FL campus). The number of positions reserved for Saint Francis students will be determined by mutual agreement between Saint Francis and the LECOM School of Pharmacy.

SELECTION OF STUDENTS FOR THE PROGRAM

For admission to Phase I of the Program, students must fulfill the following requirements:

SAT Scores (or ACT scores)	$\geq$ 1170 (or total of 26)
Grade Point Average (High School GPA)	3.5 out of 4.0
Recommendation	2 letters of recommendation
Potential	Evidence of scholarly activities and desire to become a pharmacist

ADMISSION TO PHASE II OF THE PROGRAM

The LECOM School of Pharmacy will accept Saint Francis students into the professional pharmacy curriculum who meet the criteria listed below:

- Complete the pre-pharmacy curriculum in Phase I of the 2 + 3/2 + 4 Accelerated Pharmacy Program, as described below (or as amended).
- Earn a minimum GPA of 3.4 in Phase I of the program. No course will be accepted for transfer with grade lower than "C".
- Earn a GPA of 3.4 or higher for science and mathematics courses.
- Submit two letters of recommendation. One of these letters MUST be from the Pre-professional Recommendation Committee at Saint Francis. The letter will address the personal growth of the student during Phase I of the program, as well as the student's maturity, responsibility, and desire to become a pharmacist.
- Demonstrate leadership potential and commitment to the pharmacy profession.
- Submit a completed primary application for admission to PharmCAS and a secondary application to the LECOM School of Pharmacy.

Applications for admission to the LECOM School of Pharmacy must be submitted to the Director of the Pre-Pharmacy Program at Saint Francis by January 10 of the year of matriculation into Phase II of the 2+3/2+4 Accelerated Pharmacy Program. Saint Francis students must also submit a primary application on-line to PharmCAS prior to submission of a secondary application to LECOM School of Pharmacy. The Director of the Pre-Pharmacy Program will forward the applications to the Office of Admissions at the LECOM School of Pharmacy by March 1 of the year of matriculation into Phase II of the 2 + 3/2+4 Accelerated Pharmacy Program. Students will receive official notification of acceptance into Phase II of the Program after receipt of their final transcript from Saint Francis**.**

All questions from students accepted into the 2 + 3/2 + 4 Accelerated Pharmacy Program should be directed to the LECOM School of Pharmacy Admissions Office.

LECOM School of Pharmacy will not accept transfer students into Phase I of the program.

LECOM School of Pharmacy will not accept advanced placement credit of science and mathematics courses into Phase I of the program.

LECOM School of Pharmacy will accept applications only from U.S. citizens and permanent residents.

TWO-YEAR UNDERGRADUATE PROGRAM IN PRE-PHARMACY AT SAINT FRANCIS UNIVERSITYAND THREE-YEAR PROFESSIONAL PHARMACY PROGRAM AT LECOM SCHOOL OF PHARMACY

Phase I

FIRST YEAR (SAINT FRANCIS)

FALL SEMESTER (17 Credits)	SPRING SEMESTER (17 Credits)
3 BIOLOGY 110	3 BIOLOGY 111
1 BIOLOGY 110 LAB	1 BIOLOGY 111 LAB
3 CHEM PRINCIPLES I 101	3 CHEM PRINCIPLES II 102
1 CHEM PRINCIPLES I LAB	1 CHEM PRINCIPLES II LAB
3 CALCULUS 112	3 STATISTICS 205
3 ENGLISH 103	3 HISTORY ELECTIVE
3 RELIGIOUS STUDIES 105/205	3 CORE 113 – GEN ED 1st YEAR SEM.
0 CORE 103	0 CORE 104
0 BIOL FRESHMAN SEMINAR 131	

SECOND YEAR (SAINT FRANCIS)

FALL SEMESTER (17 Credits)

3 ORGANIC CHEMISTRY I 201
1 ORGANIC CHEMISTRY I LAB
3 PHYSICS 1 104/121
1 PHYSICS 1 LAB
3 ENGLISH 104
3 PHILOSOPHY 205
3 PSYCHOLOGY 101 OR SOCIOLOGY 101
0 CORE 211: PERSONAL WELLNESS

SPRING SEMESTER (16 Credits)

3 ORGANIC CHEMISTRY II 202
1 ORGANIC CHEMISTRY II LAB
3 ECONOMICS 101
3 PHILOSOPHY 312
3 FINE ARTS ELECTIVE
3 GENERAL EDUCATION ELECTIVE
0 BIOL SOPHOMORE SEMINAR 231
0 CORE 212: COMM & GLO WELLNESS

Phase II

THIRD YEAR (First Year at LECOM School of Pharmacy)

FALL/WINTER SEMESTER (38 Credits)

Introduction to Pharmacy
Drug Information I-II
Physiology & Anatomy I-II w/lab
Introduction to Health Care Delivery
Introduction to Pharmaceutical Sciences
Pharmaceutical Calculations w/lab
Biochemistry I
Microbiology w/lab
Pharmaceutics I-II
Immunology
Service Learning: Health Care Delivery System

SPRING/SUMMER SEMESTER (34 Credits)

Biochemistry II
Pharmacy Law and Ethics
Pharmacist Provided Care
Sterile Dosage Forms w/lab
Microbiology w/Lab
Research Methods & Pharmacoepidemiology
Effective Communication in Pharmacy Practice
Intermediate Pharmacy Practice Experience

FOURTH **YEAR (Second Year at LECOM School of Pharmacy)**

FALL/WINTER SEMESTER
(38 Credits)
Clinical Pharmacokinetics
Pharmacology/Medicinal Chemistry I-II
Pharmacotherapeutics I-II w/Lab
Professional Elective
Alternative Medicine
Clinical Laboratory & Physical Assessment
Pharmacy Practice Management

SPRING/SUMMER SEMESTER
(36 Credits)
Pharmocotherapeutics III w/Lab
Clinical Nutrition
Pharmacology/Medicinal Chemistry III
Patient Safety & Medical Related Errors
Pharmacogenomics
Pharmacoeconomics & Outcomes Assessment
Pharmacotherapeutics IV w/Lab
Professional Electives

FIFTH **YEAR (Third Year at LECOM School of Pharmacy)**

FALL/WINTER SEMESTER
(30 Credits)

Advanced Pharmacy Practice Experience
Graduation Seminar

SPRING/SUMMER SEMESTER
(21 Credits)

Advanced Pharmacy Practice Experience
Graduation Seminar/Poster

(For a similar detailed curriculum paradigm for the 2+4 program at the LECOM Bradenton, FL campus, please inquire at the Biology Dept., 1st floor Science Center)

CONFERRAL OF THE DOCTOR OF PHARMACY DEGREE

The degree will be conferred upon successful completion of Phase I and Phase II of the program, both didactic and clinical, and recommendation by both the faculty and administration of LECOM School of Pharmacy. Conferral of the Pharm.D. degree will be at the end of the third/fourth year at LECOM School of Pharmacy (*fifth/sixth* year of the Program).

Students who are interested in pursuing the accelerated program in Pharmacy should contact Dr. Marian Langer, Program Coordinator and Chair of the Biology Department.

"3 + 3/3 + 4" (B.S./PHARM.D.) PROGRAM IN PHARMACY - THE LAKE ERIE COLLEGE OF OSTEOPATHIC MEDICINE SCHOOL OF PHARMACY

Under the joint agreement between LECOM School of Pharmacy and Saint Francis, students will successfully complete the three-year undergraduate program in pre-pharmacy at Saint Francis and then matriculate into LECOM School of Pharmacy (Erie campus) to complete the professional curriculum of the Doctor of Pharmacy degree (Pharm.D.) in three years (or LECOM"s Bradenton, FL campus to complete the program in four years). The accelerated professional pharmacy curriculum at LECOM School of Pharmacy will be offered in a rigorous 12-month program per academic year.

This affiliated program is referred to as *The "3+ 3/3+4" (B.S./Pharm.D.) Program in Pharmacy*. The Program will be an early-entry pre-pharmacy program that will give students the opportunity to complete their pharmacy education in two phases: Phase I consists of the first three years of undergraduate education at Saint Francis; and Phase II consists of the remaining three/four years of pharmacy education at LECOM School of Pharmacy.

SELECTION OF STUDENTS FOR THE PROGRAM

For admission to Phase I of the Program, students must fulfill the following requirements:

• SAT Scores (or ACT scores)	≥ 1170 (total of 26)
• Grade Point Average (High School GPA)	3.5 out of 4.0
• Recommendation	2 letters of recommendation
• Potential	Evidence of scholarly activities and desire to become a pharmacist

ADMISSION TO PHASE II OF THE PROGRAM

The LECOM School of Pharmacy will accept Saint Francis students into the professional pharmacy curriculum who meet the criteria listed below:

- Complete the pre-pharmacy curriculum in Phase I of the 3+3/3+4 B.S./Pharm.D. Pharmacy Program, as described below (or as amended).
- Earn a minimum GPA of 3.4 in Phase I of the program. No course will be accepted for transfer with grade lower than "C".
- Earn a GPA of 3.4 or higher for science and mathematics courses.
- Submit two letters of recommendation. One of these letters MUST be from the Pre-professional Recommendation Committee at Saint Francis. The letter will address the personal growth of the student during Phase I of the program, as well as the student's maturity, responsibility, and desire to become a pharmacist.
- Demonstrate leadership potential and commitment to the pharmacy profession.
- Submit a completed primary application for admission to PharmCAS and a secondary application to the LECOM School of Pharmacy.

Applications for admission to the LECOM School of Pharmacy must be submitted to the Director of the Pre-Pharmacy Program at Saint Francis by January 10 of the year of matriculation into Phase II of the 3+3/3+4 B.S./Pharm.D. Pharmacy Program. Saint Francis students must also submit a primary application on-line to PharmCAS prior to submission of a secondary application to LECOM School of Pharmacy. The Director of the Pre-Pharmacy Program will forward the applications to the Office of Admissions at the LECOM School of Pharmacy by March 1 of the year of matriculation into Phase II of the 3+3/3+4 Accelerated Pharmacy Program. Students will receive official notification of acceptance into Phase II of the Program after receipt of their final transcript from Saint Francis.

All questions from students accepted into the 3+3/3+4 B.S./Pharm.D. Pharmacy Program should be directed to the LECOM School of Pharmacy Admissions Office.

LECOM School of Pharmacy will not accept transfer students into Phase 1 of the program

LECOM School of Pharmacy will not accept advanced placement credit of science and mathematics courses into Phase 1 of the program.

LECOM School of Pharmacy will accept applications only from U.S. citizens and permanent residents.

THREE-YEAR UNDERGRADUATE PROGRAM IN PRE-PHARMACY AT SAINT FRANCIS UNIVERSITY AND THREE-YEAR PROFESSIONAL PHARMACY PROGRAM AT LECOM SCHOOL OF PHARMACY

Phase I
Biology Major (3+3 B.S./Pharm.D. Program in Pharmacy)

FALL			SPRING		
First Year					
Course No.	**Description**	**Cr.**	**Course No.**	**Description**	**Cr.**
BIOL 110	Evol, Eco, & Plant Bio & lab	4	BIOL 111	Mol., Cells & An. Phys. & lab	4
CHEM 101	Chemistry Principles I & lab	4	CHEM 102	Chemistry Principles II & lab	4
MATH 121	Calculus/Geom I		STAT 205	Essentials of Statistics	3
Or 111	Finite Math	3			
ENGL 103	Writing for Discipline	3	HIST XXX	History Elective	3
RLST 105/205	Francis and Global Issues or Faith/Franciscanism	3	CORE 113	Gen Ed 1st Year Seminar	3
CORE 103	Fall Comm. Enrich. Series	0	CORE 104	Spring Comm. Enrich. Series	0
BIOL 131	Biol Freshman Seminar	0			
Total Credits		**17**	**Total Credits**		**17**

****In the Sophomore year, students will need to apply in January to appear before the Pre-professional committee. Summer before /early fall of Junior year, application for admission to the LECOM School of Pharmacy must be completed. See your advisor about completing your Career Statement and resume. If part of the agreement, you should already have received an interview at LECOM and would not be required to take the PCAT.**

Second Year					
BIOL 211	Comp Vert Anat & lab	4	BIOL 406	Vert Physiology & lab	4
CHEM 201	Organic Chemistry I & lab	4	CHEM 202	Organic Chemistry II & lab	4
ENG 104	Intro to Literature	3	PSYC 101*	Intro to Psychology	3
PHIL 205	Reason and Responsibility	3	PHIL 312	Health Care Ethics	3
GETM III	Div & Comm Outer Core (III)	3	FNAR XXX	Fine Arts Elective	3
CORE 211	Personal Wellness	0	CORE 212	Comm & Global Wellness	0
			BIOL 231	Biol Sophomore Seminar	0
Total Credits		**17**	**Total Credits**		**17**

Third Year					
BIOL 301	Genetics & lab	4	BIOL 302	Gen Microbiology & lab	4
PHYS 104	Intro to Physics I & lab	4	PHYS 105	Intro to Physics II & lab	4
or 121	Gen Physics I & lab		or 122	Gen Physics II & lab	
BIOL 401	Cell & Mol Bio & lab	4	GETM IV	Soc Sys Outer Core (IV)*	3
SOC SCI*	Elective	3	BIOL 405	Biochemistry	3
BIOL 331	Biology Junior Seminar	0			
EXAM 301	Writing Competency	0	CORE 407	Keystone Seminar	3
LANG XXX	Foreign Lang. (102 or higher)	3			
Total Credits		**18**	**Total Credits**		**17**

. **Phase II is completed at LECOM. After successfully completing the first year of Phase II, students receive their B.S. from Saint Francis University.**

Note: Sequence of courses may be altered with advisor's approval.
* Economics is required and either PSYC 101 or Sociology as the second social science elective

Phase II

***FOURTH* YEAR (First Year at LECOM School of Pharmacy)**

FALL/WINTER SEMESTER (38 Credits)

Introduction to Pharmacy
Drug Information I-II
Pharmaceutics I-II
Physiology & Anatomy I-II w/lab
Introduction to Health Care Delivery
Introduction to Pharmaceutical Sciences
Pharmaceutical Calculations w/lab
Biochemistry I
Immunology
Service Learning: Health Care Delivery System

SPRING/SUMMER SEMESTER (34 Credits)

Biochemistry II
Pharmacist Provided Care
Pharmacy Law and Ethics
Sterile Dosage Forms w/lab
Microbiology w/Lab
Research Methods & Pharmacoepidemiology
Effective Communication in Pharmacy Practice
Intermediate Pharmacy Practice Experience

***FIFTH* YEAR (Second Year at LECOM School of Pharmacy)**

FALL/WINTER SEMESTER (38 Credits)

Clinical Pharmacokinetics
Pharmacology/Medicinal Chemistry I-II
Pharmacotherapeutics I-II w/Lab
Professional Elective
Alternative Medicine
Clinical Laboratory & Physical Assessment
Pharmacy Practice Management

SPRING/SUMMER SEMESTER (36 Credits)

Clinical Nutrition
Pharmacology/Medicinal Chemistry III
Patient Safety & Medical Related Errors
Pharmacoeconomics & Outcomes Assessment
Pharmacogenomics
Pharmacotherapeutics III-IV w/Lab
Professional Electives

***SIXTH* YEAR (Third Year at LECOM School of Pharmacy)**

FALL/WINTER SEMESTER (30 Credits)

Advanced Pharmacy Practice Experience
Graduation Seminar

SPRING/SUMMER SEMESTER (21Credits)

Advanced Pharmacy Practice Experience
Graduation Seminar/Poster

(For a similar detailed curriculum paradigm for the 3+4 program at the LECOM Bradenton, FL campus, please inquire at the Biology Dept., 1st floor Science Center)

CONFERRAL OF THE DOCTOR OF PHARMACY DEGREE

The degree will be conferred upon successful completion of Phase I and Phase II of the program, both didactic and clinical, and recommendation by both the faculty and administration of LECOM School of Pharmacy. Conferral of the Pharm.D. degree will be at the end of the third (or fourth) year at LECOM School of Pharmacy (6^{th} /7^{th} year of the Program). The Bachelor of Science (B.S.) degree will be conferred on "3+3/3+4" students after successful completion of all SFU requirements and year one of Phase II of the Program.

Students who are interested in pursuing the BS/PharmD program in Pharmacy should contact Dr. Marian Langer, Program Coordinator and Chair of the Biology Department.

"2+/3+" (B.S./PHARM.D.) PROGRAM IN PHARMACY – DUQUESNE UNIVERSITY

Objectives of this Agreement

This cooperative program between Saint Francis University and Duquesne University is a six-year doctorate program leading to the Doctor of Pharmacy (Pharm.D.) degree. The Pre-Pharmacy Early-Entry Program at Saint Francis University allows academically qualified students to attend Saint Francis University for two years of pre-pharmacy course work before transferring to the Duquesne University Mylan School of Pharmacy. Students must be accepted into the Saint Francis University Early-Entry Program as freshmen and must complete the first two years of their undergraduate work at Saint Francis University. Because of the Saint Francis University special affiliation with Duquesne University, students who successfully complete the two-year program at Saint Francis are given preferential consideration for admission to the professional phase of the Doctor of Pharmacy Program at Duquesne University. If not accepted, students may elect to complete an undergraduate degree at Saint Francis University in Biology, Chemistry, Liberal Arts, or Liberal Studies over the course of two more years of study. Students may also be considered for admission into the Bachelor of Science in Health Care Supply Chain Management Program at Duquesne University.

Bachelor's Degree Pathway – Baccalaureate / Pharm.D.

Saint Francis students may opt to complete a third year at Saint Francis University prior to matriculating to Duquesne University Mylan School of Pharmacy. Students successfully completing their third year at Saint Francis as described in the Agreement and a successful first year at Duquesne University Mylan School of Pharmacy will be awarded a B.A. degree in Chemistry or a B.S. degree in Biology from Saint Francis University. The students will be able to participate in Commencement at Saint Francis, graduating with their peers. Note that acceptance of a degree from Saint Francis University prior to entering the fourth professional year of the program at Duquesne University will change student status to that of "graduate", which may affect eligibility for federal and state financial aid.

Requirements for Admission into the Saint Francis University Pre-Pharmacy Early-Entry Program

Candidates for admission to the Pre-Pharmacy Early-Entry Program are required to:

- Have an SAT total of 1050 or higher; ACT total of 24 or higher on the Math and Critical Reading Sections;
- Earn a Grade Point Average of 3.00 or higher on a 4.00 scale;
- Demonstrate evidence of leadership potential, community service, and co-curricular activities.
- Provide one letter of recommendation from either a high school teacher or guidance counselor.

Admissions Process for Professional Phase at Duquesne University

Students should apply to Duquesne University by the January 15th yearly deadline during their sophomore year at Saint Francis University. All applicants will be placed into a pool of Saint Francis University applicants from which students will be chosen. Once offered acceptance, students will have two weeks to send their enrollment deposit to Duquesne in order to reserve their space in the program. If the deadline passes without a deposit, the prospective student's space will be given to another student, and they will be placed at the bottom of the applicant wait list.

Financial Aid Process for Professional Phase at Duquesne University

Accepted, transfer applicants are eligible to be considered for University academic scholarships and need-based financial aid funds. Please contact the Office of Financial Aid at 412-396-6607 or visit on-line at www.financialaid.duq.edu for additional information on the application process.

Duquesne University Mylan School of Pharmacy Requirements

Duquesne University will admit up to four Saint Francis students, in each academic year, who meet the criteria listed below. At the discretion of Duquesne, more than four students may be admitted in any given year, depending upon space availability. Candidates for admission to Duquesne University Mylan School of Pharmacy are required to:

- Complete the two-year undergraduate Pre-Pharmacy curriculum at Saint Francis University including core curriculum requirements;
- Earn a minimum grade of "C" in all Saint Francis University undergraduate courses;
- Maintain a minimum overall GPA of 2.50 or better in all Saint Francis University undergraduate courses;
- Participate in an interview process with the Duquesne University MSOP faculty;
- Submit a letter of recommendation from the Saint Francis University Pre-Pharmacy Selection Committee;
- Provide evidence of leadership potential and commitment to the pharmacy profession.

Preference will be granted to candidates who meet the following criteria:

- Achieve a composite PCAT (Pharmacy College Admission Test) score of 375 or better;
- Achieve a GPA of 3.00 or higher for all science and math courses taken at Saint Francis University;
- Achieve a cumulative Grade Point Average of 3.00 or higher in the Pre-Pharmacy Early-Entry Program.

Bachelor of Science, Biology: B.S. + PharmD (Duquesne 3+4)

****Sequence of courses may be altered with consent of advisor.*

Course No.	Description	Cr.
First Year	**Fall**	
□ BIOL 110	Evolution, Ecol, & Plant Biol.	4
□ CHEM 101	Chemistry Principles I	4
□ MATH 121	Calculus/Geom I	3
□ ENGL 103	Writing for Discipline	3
□ HIST xxx	History Elective	3
□ CORE 103	Fall Comm. Enrich. Series	0
□ BIOL 131	Biology Freshman Seminar	0
Total Credits		**17**

Course No.	Description	Cr.
First Year	**Spring**	
□ BIOL 111	Molecules, Cells, & Anim. Phys.	4
□ CHEM 102	Chemistry Principles II	4
□ Statistics	Statistics Course (see note)	3-4
□ RLST 105	Francis and Global Issues	3
□ CORE 113	Gen Ed 1st Year Seminar	3
□ CORE 104	Spring Comm. Enrich. Series	0
Total Credits		**17-18**

Second Year	Fall	
□ BIOL 211	Comp. Vertebrate Anat.	4
□ CHEM 201	Organic Chemistry I	4
□ ENGL 104	Intro to Literature	3
□ PHIL 205	Reason and Responsibility	3
□ GETM III	Div & Comm Outer Core (III) RLST	3
□ CORE 211	Personal Wellness	0
Total Credits		**17**

Second Year	Spring	
□ BIOL 406	Vertebrate Physiology	4
□ CHEM 202	Organic Chemistry II	4
□ SOC SCI	Economics	3
□ PHIL 312	Health Care Ethics	3
□ FNAR xxx	Fine Arts Elective	3
□ CORE 212	Community & Global Wellness	0
□ BIOL 231	Biology Sophomore Seminar	0
Total Credits		**17**
**		

Third Year	Fall	
□ BIOL 301	Genetics & lab	4
□ PHYS 121	Gen. Physics I	4
□ BIOL 401	Cell & Molecular Biology	4
□ SOC SCI	Psychology	3
□ BIOL 331	Biology Junior Seminar	0
□ EXAM 301	Writing Competency	
□ LANG XXX	Foreign Lang.(102 or higher	3
Total Credits		**15**

Third Year	Spring	
□ BIOL 302	General Microbiology	4
□ PHYS 122	Gen. Physics II	4
or 105	Intro to Physics II	
□ GETM IV	Soc Sys Outer Core(IV) (Sociology)	3
□ BIOL 405	Biochemistry	3
□ CORE 407	Keystone Seminar	3
Total Credits		**17**

Pharmacy Calculations (2credits) must be completed the summer before matriculating to the Mylan School of Pharmacy

Admission

Requirements for admission and other details of the "3+4" Program in Pharmacy are described in the Affiliation Agreement between Duquesne University Mylan School of Pharmacy and Saint Francis University

Degrees

After completing three years at Saint Francis University and a successful year at Duquesne School of Pharmacy, the student is awarded a B.S. from Saint Francis University in Biology. The conferral of the Doctor of Pharmacy degree occurs after successful completion of all coursework at Duquesne and by recommendation of the Duquesne University Mylan School of Pharmacy.

Note:

Statistics Requirement can be fulfilled by:

BIOL 315 – Biostatistics (S)

MATH 215 – Introductory Statistics (F,S)

STAT 205 – Essentials of Statistics (F,S)

THE CHINCOTEAGUE BAY FIELD STATION, WALLOPS ISLAND, VIRGINIA

The Chincoteague Bay Field Station (CBFS) is a non-profit educational corporation dedicated to promoting education and research in the marine sciences. The CBFS was founded in 1968 by three colleges but today is composed of 16 universities, including 10 State System of Higher Education of Pennsylvania universities and a few private and state universities outside of Pennsylvania. The Field Station owns and operates two field stations in coastal Virginia.

The Field Station's main campus is ideally located near Wallops Island, Virginia, on the Eastern Shore of Virginia between the Atlantic Ocean and Chesapeake Bay. Nearby barrier islands are biologically diverse and geologically dynamic. Many of the islands and marshes remain undeveloped and area waters have sustained fishing, crabbing, and oystering for generations. Additional resources within the area include Chincoteague National Wildlife Refuge, Assateague National Seashore, and NASA/Wallops Flight Facility.

SFU students enrolled in the Marine Biology concentration are strongly encouraged to enroll in summer classes at the CBFS. Some of the classes offered include:

Introduction to Oceanography	Field Methods in Oceanography
Marine Invertebrates	Marine Biology
Marine Ecology	Behavior of Marine Organisms
Chemical Oceanography	Marine Ichthyology
Marine Ornithology	Research Diver Methods
Aquaculture	Coral Reef Ecology
Marine Mammals	Problems in Marine Science

For more information about the Chincoteague Bay Field Station at Wallops Island, Virginia, see Dr. Sue Shoemaker in 103 Science Center.

ENVIRONMENTAL SCIENCE 3 – 2 OPTION WITH DUKE UNIVERSITY

The Duke School of the Environment 3-2 cooperative program is a highly-competitive alternative available to Saint Francis University environmental concentration students. The program is designed to save the qualified student time and money, and to enable the student to proceed on to more specialized study following the junior year. While Saint Francis students are eligible to apply for admission to Duke after three years of study, there is *no guarantee* of admission to Duke.

Students interested in admission to Duke should complete their applications by February 15 of their junior year. The application includes an application form, letters of recommendation, transcripts, GRE scores, financial aid forms, an application fee, and a statement from Saint Francis releasing the students from their senior year at Saint Francis University. Currently, about 15% of 3-2 applicants are accepted by the School of the Environment. Last year, the average QPA of accepted applicants was 3.360, and average GRE scores was 642 in verbal, 686 in mathematics, and 674 in analytical.

After one year of graduate work, students in the 3 - 2 program will receive a Bachelor of Science degree in Biology from Saint Francis University, assuming the students have followed the undergraduate course of study. After two years at Duke, students are eligible to receive a professional masters degree from the School of the Environment in one of five specialized areas. The areas include: (1) forest resource management, (2) resource ecology, (3) exotoxicology and environmental chemistry, (4) water and air resources, and (5) resource economics and policy. The School anticipates adding a sixth area in coastal zone management. Please note that these are *professional* degrees, not *Masters* of Science or Doctoral degrees.

Other Saint Francis students may prefer to complete the baccalaureate degree before undertaking graduate study at Duke. The master's degree requirements for these graduates are the same as those for students entering Duke after three years.

By means of these programs, Saint Francis University and Duke University join in cooperation to the advantage of both institutions and of the students involved. The entire program provides a unique combination of liberal and professional education well suited for those desiring to enter the field of natural resources and the environment.

For more information on the Environmental Science 3 –2 Option with Duke University, contact Dr. Lane Loya in 114 Science Center.

MEDICAL LABORATORY SCIENCE/MEDICAL TECHNOLOGY PROGRAM HOSPITAL AFFILIATIONS

Qualified students will transfer for the senior year to a hospital with a CAHEA-accredited School of Medical Technology for 12 consecutive months. There the student, under the supervision of a pathologist, will study various subjects such as Clinical Chemistry, Immunohematology and Blood Banking, Bacteriology, Parasitology, Immunoserology and Urinalysis, totaling 32 transferable credits. Grades earned during the clinical year will be included in the final quality point average.

Upon satisfactory completion of the prescribed hospital course, the student will receive the Bachelor of Science degree in Medical Technology, conferred by the University.

SFU has affiliations with Medical Technology programs in the following institutions:

Altoona Hospital School of Medical Technology
Conemaugh Health System
Thomas Jefferson University
Women's Christian Association Hospital

Courses Required

Listed below are the major courses required for a degree in medical technology.

Bachelor of Science in Medical Technology
Major Requirements

- Biology 111, 205, 206, 214, 301, and 305;
- Mathematics 121, 122 or 111, 112 with approval of the chair;
- Physics 104 or 121;
- Chemistry 101, 102, 201, 202;
- Statistics 101.

Computer Science is recommended.

For more information on the Medical Technology program, see Dr. Marian Langer, Department Chair, in 108 Science Center.

SFU INTERDISCIPLINARY NEUROSCIENCE MINOR

The Neuroscience minor is an interdisciplinary program of study the aim of which is to examine the relationship between the brain and behavior from a variety of perspectives. Those perspectives include the obvious link to psychology, as well as the biological, chemical and philosophical perspectives. The aim of the minor is to provide information that will allow students to see the connection between their particular major and behavior. Additionally, the interactions that will occur between students and faculty of different disciplines will facilitate the integration of knowledge necessary for a broader foundation in neuroscience.

The neuroscience minor as a true interdisciplinary program is not housed in any particular department. Direction of the program is by committee with representatives from four departments: Biology -- Dr. Marian Langer, Psychology -- Dr. Steven Gilmour, Chemistry -- Dr. Rose Clark, and Physical Therapy -- Dr. Stephen LoRusso. The responsibility of the faculty directing the program is to oversee the program and to help students develop a course of study in neuroscience related to their major.

The minor in neuroscience enables students to make explicit the idea that neuroscience is truly an interdisciplinary science with foundations in psychology, biology, and chemistry; it also enables students to enhance the career options of various majors by broadening their general educational experience. This minor is well-suited to students who are contemplating professional or research careers.

Interdisciplinary Minor in Neuroscience Requirements

- Neuroscience 279 and 450
- Psychology 101
- Biology 111
- Biology 205 (Human Anatomy & Physiology I) or 406 (Vertebrate Physiology)
- Two of the following courses: Psychology 205 (Abnormal Psychology), 302 (Sensation and Perception), 305 (Memory and Cognition), or 314 (Biopsychology)

For more information on the Neuroscience minor, contact Dr. Marian Langer, Department Chair, in 108 Science Center.

HELPFUL BIOLOGY DEPARTMENT INFORMATION

GET INVOLVED IN THE DEPARTMENT!

You are strongly encouraged to get involved within the Biology Department during your years at SFU. This will help you get to know other students as well as faculty, develop as an individual, acquire new skills and knowledge, build your resume, and also have fun! There are various ways that you can get involved:

- Actively participate in at least one club (Biology Club, Environmental Awareness Society, Scuba Club)
- Complete your work-study job in the Biology Department
- Serve as a Laboratory Assistant
- Do undergraduate research
- Attend Biology Department-sponsored events
- Volunteer to serve as a mentor or tutor for underclassmen biology majors

BIOLOGY DEPARTMENT EXPECTATIONS TIMELINE

As you progress through your years at SFU, there are certain things that will be expected of you within the Biology Department. Here are some expectations to keep in mind:

Freshman Year

Attend Biology Student Mixer during 1st/2nd week of classes
Participate in Biology Freshmen book discussion session
Attend Biology Club meetings

Sophomore Year

Attend Biology Club meetings
Consider undergraduate research for Junior Year
Over summer begin review for graduate or professional school entrance exams
Consider doing an internship, shadowing, or other type of practical experience during the summer

Junior Year

Prepare career statement and resume
Meet with Recommendation Committee
Attend Biology Club meetings
Take or schedule to take GRE, NTE, MCAT, OAT, VCAT, DAT, or other exams as required

Career Statement – The career statement is a working document which requires a student to focus on the process of selecting a career. The document has many uses, one of which is preparing a document suitable for inclusion in letters of recommendation for graduate school,

professional school or employment. This is a one page autobiographical statement of how you became interested in your intended profession, researched the profession and gained practical experience about the profession. (See guidelines on next page.)

Resume – A resume should be completed in conjunction with the Office of Career Services and submitted with the career statement no later than the end of the first semester, Junior Year.

Recommendation Committee – SFU has three different Recommendation Committees (Graduate School, Medical Technology, and Pre-Professional). Graduate and professional schools prefer committee recommendations in the candidate's application. The Committees traditionally meet in March or early April. If a student wishes to meet before a recommendation committee, he/she must inform the Chair of the Biology Department in writing, requesting an evaluation by the committee. The student must also fulfill certain requirements. The following requirements must be completed by the end of the first semester of the Junior Year to be eligible to meet before a Recommendation Committee:

1. A finalized copy of your career statement and resume are submitted to the Chair.
2. Provide evidence of the following:
   A. Discussed your career plans with your advisor.
   B. Prepared for admissions test for your graduate area.
   C. Applied to take the admissions test.
   D. Know the admissions requirements for the schools to which you will be applying.
   E. Completed or plan an internship, shadowed a professional, conducted research or worked in some capacity in the profession.

Admission Test Dates – Students pursuing graduate degrees should prepare for admissions tests during the summer between sophomore and junior years. For dentistry, the DAT is administered in April and October. For medicine, the MCAT is administered in April and August. For optometry, the OAT is administered in February and October. For veterinary medicine, the VCAT or GRE is required. For graduate school, the GRE is usually required. It is administered in November, December, and April.

Senior Year

Apply to graduate or professional schools
Begin job search
Attend Biology Club meetings

Completion of Applications – Students should be aware of application deadlines and plan to have all forms and materials prepared and forwarded well in advance of a closure date. It is suggested that applications be completed during the summer following completion of the Junior Year.

*NOTE: There may be other expectations of you (e.g., special course work, career-related experiences, etc.) depending on your particular major concentration. See the major checksheets listed previously in this handbook and talk with your academic advisor. Remember it is YOUR responsibility to be aware of and fulfill these obligations.

SUGGESTED CONTENT FOR CAREER STATEMENT

A career statement should contain, but is not limited to the following. Of course you should include only those that would apply to your chosen career path.

Goals:

-What are your goals?
- When and how did these goals first begin to develop?
- In what ways have you explored the various elements of this career?

Qualifications:

- What are your academic qualifications that will aid you in pursuing advanced study and your eventual career goal?
- What non-classroom activities and/or work experiences have contributed to your skills and how have they done so?
- What personal qualities will aid you in graduate study and the pursuit of your career goal and how will they aid you?
- What do you plan to do in the coming year to further enhance your qualifications?

Motivation:

-Why have you chosen advanced study as an option now?
- In what specific ways do you believe advanced study will be beneficial to you?
- What weaknesses will advanced study help you overcome and how will you begin overcoming these during your final year of undergraduate study?

**Also make sure you proofread the statement for grammar and spelling.

INTERNSHIPS

Completing an internship is an excellent way to get firsthand experience in a particular area of interest. The experience also enables the student to network with professionals in the field, gain valuable skills and knowledge, and build an impressive resume.

There are many opportunities for internships through government agencies, educational institutions, and organizations in the public and private sectors. Depending upon the facility, internships may be available in the summer or during the academic year, or both.

Students desiring an internship should contact their academic advisor to begin planning for the internship experience. A student may present no more than 15 hours of internship credit toward graduation requirements and no more than 9 hours of internship credit for the major. Students must complete an internship contract (shown on next two pages) defining objectives, duties, and assignments for the internship experience.

All students must complete an associated project, a study or essay related to the internship. This project will be divided into two categories (graded credits with a 398 course number and pass/fail credits with a 399 course number) as follows:

Total Credits	Graded Credits (398)	Pass/Fail Credits (399)
1 – 5	1	0 – 4
6 – 10	2	4 – 8
11 – 15	3	8 – 12

Students will be required to keep a daily log or journal as part of the project grade and are required to read a book pertinent to the internship setting, writing a brief review of the book as seen from the perspective of the internship.

SAINT FRANCIS UNIVERSITY
Loretto, Pennsylvania
INTERNSHIP CONTRACT

I. Student Name:

II. Briefly describe your intended internship, noting course work and experience that will enable you to profit from this particular internship listing the duties of the internship. *(One-half page minimum).*

III. Location of Internship: (include city and state)

IV. Internships are only possible in states outside Pennsylvania that have given authorization. Does Saint Francis University have authorization for internships in this state? ____Yes
Visit http://francis.edu/state-authorization/ to answer the question.

V. On-Site Supervisor:

Saint Francis University Faculty Supervisor:

VI. Credits to be earned/course number(s):
(example: 3 credits: COMM 398 – 1 credit; COMM 399 – 2 credits)

VII. Starting/Ending dates of internship: From To

(over)

VIII. Title/Author of book you plan to read in connection with your internship:

IX. Please state three educational objectives which you hope to accomplish. **Be precise.**

X. Describe the three credit hour project which you will complete during the course of this internship. (One page minimum).

_____
Student/Date

_____
On-Site Supervisor/Date

_____
Saint Francis University Supervisor/Date

_____
Associate Provost/Date

UNDERGRADUATE RESEARCH

Undergraduate research at Saint Francis University takes many forms. In the biology department, students are encouraged to explore a significant question in their area of interest. After consultation with a faculty member, the student will research their chosen subject and develop a proposal. Students work closely with their faculty mentor to complete the project.

In addition to opportunities on the Saint Francis University campus, several organizations sponsor off campus research experiences.

Undergraduate research fosters critical thinking, creativity, resourcefulness, and self-reliance. Successful completion of a project develops the skills students need to succeed in a research career. It is also an excellent way for students to set themselves apart from other students, to demonstrate a higher level of thinking ability and seriousness of purpose. The nature of scientific research requires that the student integrate concepts, knowledge, and skills from many subject areas.

Undergraduate research requires a commitment by the faculty at St. Francis University. Faculty members are both teachers AND scholars, committed to nurturing the abilities of the next generation of scientists, teachers, and health care professionals. Undergraduate research teams students with faculty in a joint venture where both parties learn from each other.

Students have the opportunity to write grants to fund their project. There are numerous sources of funding from external sources. Also SFU awards Undergraduate Research Initiative Grants to deserving research projects each Spring Semester.

Whether a student plans to enter the working world or attend graduate school, undergraduate research experience is a valuable asset. Employers and graduate school professors alike value the research, writing, analytical and problem-solving skills that are enhanced by research process. These skills, combined with the self-assurance gained from completing such a substantial project, prepare students well for life beyond Saint Francis.

DEPARTMENTAL HONORS IN BIOLOGY

To receive Departmental Honors in Biology, a student must sign up for six credits of research, for which he/she must receive a grade of "A". The student must also submit a proposal of his/her research, how it will be evaluated and what the final product will be (poster presentation, publication, etc.) as agreed upon with his/her advisor. This would basically follow the guidelines indicated for an Independent Study Proposal. The proposal is to be submitted to the Department Chair for approval. After approval, the Chair will notify the administrative assistant for the School of Science. They he/she notifies the head of the Honors Program and the Registrar, who verify the grades for the student's research credits, so that "Biology Departmental Honors" can be indicated on the student's transcript and in the graduation program.

GUIDELINES FOR LABORATORY ASSISTANTS

Laboratory assistants aid the instructor of the laboratory throughout the semester. Depending upon the particular laboratory, the laboratory assistant's duties will vary. However, all Biology Department Laboratory Assistants are expected to adhere to these guidelines:

1. Obtain a syllabus and laboratory manual from the laboratory instructor.

2. See the instructor a week in advance of a scheduled laboratory for instructions relating to your responsibilities. You must be prepared to assist students to achieve the objectives for each laboratory.

3. Maintain a clean and orderly laboratory. Table tops should be cleaned of all debris and washed after each laboratory session. Replace stools, microscopes, models, slides, etc., to their proper location, at the end of each laboratory.

4. Circulate around the room during the laboratory session in order to assist students and answer their questions.

5. Dirty glassware should be rinsed and placed in the Biology Prep Room for washing.

6. Unexcused absences or early departures will not be tolerated. If you will not be able to attend a scheduled lab session, inform the instructor at least 24 hours in advance.

7. Time cards should be completed following each laboratory. These are to be kept in the Biology Department Office in Science Center 107.

8. A written evaluation of your performance will be placed in your permanent file.

SECONDARY EDUCATION STUDENT LABORATORY TEACHING EVALUATION

As a Biology -Secondary Education major, you are expected to take part in a non-credit laboratory experience during your Junior year. This will involve attending a freshman biology lab (Biology I or II lab), assisting the students and instructor, and actually teaching at least one of the laboratory sessions. This is a great way to get experience teaching and to become more comfortable in front of a class of students.

At the end of the semester, the instructor with whom you are working will complete an evaluation of your performance during the semester. This evaluation will then be kept in your student file.

On the following two pages is a copy of the evaluation form that will be used for this non-credit laboratory experience.

BIOLOGY DEPARTMENT
Secondary Education Student Laboratory Teaching Evaluation

Student_____ Evaluator_____ Date_____

Course Number & Name_____ Course Topic_____

A scale of 1 to 5 appears for each criterion to be evaluated. The scale corresponds to the candidate's level of performance: 1 = unsatisfactory, 2 = poor, 3 = fair, 4 = good, 5 = excellent. During the laboratory session, circle the score for each item that best represents the candidate's performance.

1.	Candidate was organized and prepared for the lab.	1	2	3	4	5
2.	Candidate dressed in appropriate professional attire.	1	2	3	4	5
3.	Candidate clearly stated measurable objectives for the lab session.	1	2	3	4	5
4.	Candidate provided sufficient prelab instruction so that the students had enough background information to fulfill the prescribed objectives.	1	2	3	4	5
5.	Candidate explained and presented material in a logical and understandable manner.	1	2	3	4	5
6.	Candidate effectively used training aids/technology to benefit learning. Circle training aids used: blackboard, PowerPoint presentation, models, handouts, other_____	1	2	3	4	5
7.	Candidate spoke clearly and loudly enough for all students in the lab to hear.	1	2	3	4	5
8.	Candidate knew the background information well enough to teach this lab.	1	2	3	4	5
9.	Candidate seemed concerned about the students learning the laboratory material.	1	2	3	4	5
10.	Candidate correctly responded to students' questions.	1	2	3	4	5
11.	Candidate was approachable and effectively assisted students during the lab session.	1	2	3	4	5

(See other side)

Evaluator should briefly comment on the candidate's overall performance, noting strengths and weaknesses observed.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Signature_____

Date_____

PREPARING FOR GRADUATE AND PROFESSIONAL SCHOOL EXAMS

Students interested in pursuing graduate degrees should be familiar with the admissions requirements of the schools to which they are interested in applying. Generally, these are the exams required:

Field	Exam(s) Required	Exam Dates
Dentistry	DAT	April, October
Medicine	MCAT	April, August
Optometry	OAT	February, October
Podiatry	MCAT	April, August
	GRE	April, November, December
Veterinary medicine	VCAT	October, November, January
	GRE	April, November, December
Graduate School	GRE	April, November, December

Preparation for these exams should begin during the summer between the sophomore and junior year. Self study manuals and formal review courses are available for each discipline. Information can be obtained in the Biology Student Zone (Science Center room 119). Also, further information is available from the following agencies:

American Association of Dental Schools
1625 Massachusetts Ave., NW
Washington, DC 20036-2212
Tel: 202-667-9433
Fax: 202-667-0642
Internet: Publications@AADS.JHU.EDU

Membership and Publication Order
Association of American Medical Colleges
2450 N Street, NW
Washington, DC 20037-1129
(202) 828-0416

Association of Schools and Colleges of Optometry
6110 Executive Boulevard
Suite 690
Rockville, MD 20852
(301) 231-5944

American Veterinary Medical Association Headquarters
1931 North Meacham Road – Suite 100
Schaumburg, IL 60173
(847) 925-8070

The Biology Department asks that a copy of the student's test score be sent to the Chair of the Biology Department.

CLUBS AND ORGANIZATIONS

Saint Francis University offers a tremendous number of extracurricular student clubs and organizations in which students can get involved. These groups provide opportunities for socialization with others, development of leadership skills, personal growth, educational experiences, and fun. Four organizations in particular are associated with the Biology Department. They are:

BETA BETA BETA (TRIBETA) BIOLOGICAL HONOR SOCIETY

Beta Beta Beta Biological Honor Society (TriBeta) is a society for students, particularly undergraduates, dedicated to improving the understanding and appreciation of biological study and extending boundaries of human knowledge through scientific research. It seeks to encourage scholarly attainment in this field of learning by reserving its regular membership for those who achieve superior academic records and who indicate special aptitude for and major interest in the life sciences. It desires to cultivate intellectual interest in the natural sciences and to promote a better appreciation of the value of biological study and thus welcomes into associate membership all those students who are interested in biology. Since its founding in 1922, more than 175,000 persons have been accepted into lifetime membership, and more than 430 chapters have been established throughout the United States and Puerto Rico.

The Upsilon Beta Chapter was established at St. Francis in April 1980 with an charter membership of 20 students and 5 faculty. Since that time, the Upsilon Beta chapter has inducted 152 Regular, 27 Associate and 4 Faculty members. Numerous members have received Research Scholarship Grants from the Tribeta National office, presented research at regional meetings and have won John C. Johnson Awards for poster presentations of that research and published in the journal BIOS.

Requirements for induction to the Upsilon Beta chapter at St. Francis are:

- completion of at least three courses (including laboratories) in the biological sciences.
- have completed these with an average grade of B or its equivalent.
- are in good academic standing.
- are a Biology major (regular membership) or Life Science major (associate membership)

Inductions usually take place during the Spring semester. Grades through the preceeding Fall are used to determine eligibility.

Faculty Advisor: Dr. Marian G. Langer

BIOLOGY CLUB

The Biology Club offers educational experiences and explores career alternatives in biology. This club works to promote a greater awareness of current issues in biology. Speakers are hosted from various biology-related occupations to talk with students about career choices and options. Activities, such as trips to zoos and science centers, are frequently planned to provide students with additional fun and interesting ways to learn biology.

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Faculty Advisor: Dr. John Trimble

ENVIRONMENTAL ACTION SOCIETY

The Environmental Action Society promotes environmental education to the students, faculty, and staff of Saint Francis University and environmental awareness in the community at large. The organization works to foster and promote a better understanding and appreciation of the environment through activities and services.

Faculty advisors: Dr. Lane Loya & Dr. Timothy Bintrim

HOSA (HEALTH OCCUPATIONS STUDENTS OF AMERICA)

Health Occupations Students of America (HOSA) is a nationally affiliated organization new to Saint Francis University that is focused on helping health career students with their future endeavors. We are endorsed by the U.S. Department of Education and the Health Science Education Division of ACTE. It was brought to this campus as a way of connecting all health sciences at Saint Francis so that we can work together and increase the delivery and quality of healthcare. Also, HOSA seeks to promote healthcare opportunities for all its members.

HOSA offers members:

- Scholarships
- Assistance with finding hospitals for shadowing and volunteering
- Philanthropy opportunities
- Guest Speakers such as school recruiters and professionals
- Access to Resources like:
  AMCAS and other guide books, along with board prep materials
- Organizational meetings to study for MCAT/DATS/OATS/GRES/PCATS/PANCE and other board prep

Faculty advisor: Dr. Justin Merry

SCUBA CLUB

The Saint Francis University Scuba Club offers students the opportunity to learn to scuba dive, continue to build their diving skills, travel to various diving locations, and have fun with others while exploring the fascinating underwater world. Various activities are sponsored by the Scuba Club throughout the year to keep divers actively involved in the sport.

Diver education courses are affiliated with PADI (Professional Association of Diving Instructors), a worldwide diver training agency. Courses offered at Saint Francis University include:

- Open Water Diver
- Advanced Open Water Diver
- Rescue Diver
- Divemaster
- Various Specialty Diver Courses including:
    - Underwater Naturalist
    - Fish Identification
    - Wreck Diving
    - Deep Diving
    - Photography
    - Videography
    - Nitrox
- Assistant Instructor
- Instructor

Faculty Advisor: Mr. Nick Weakland

Course Instructors: Dr. Sue Shoemaker, PADI Course Director
Ms. Shelley Kirkpatrick, PADI Master Scuba Diver Trainer
Mr. Nick Weakland, PADI Open Water Instructor
Dr. Pat Fitzgerald, PADI Open Water Instructor

AWARDS

UNDERGRADUATE RESEARCH GRANTS

Saint Francis University offers **Undergraduate Research Grants** for deserving research projects. Applications for these awards are taken each Fall and Spring semester. These competitive grants require students to thoroughly research their topic and write a grant proposal. The proposals are evaluated by a committee and ranked in order of merit. Awards for the Fall applications are announced at the end of November; awards for the Spring applications are announced at the annual School of Sciences Awards Ceremony in April.

BIOLOGY SENIOR DEPARTMENTAL AWARD

This award is given annually to the graduating senior in the Biology Department with the highest overall QPA. The award is presented at the annual School of Science Awards Convocation at the end of the Spring Semester.

BIOLOGY DEPARTMENT SERVICE AWARD

This award is given annually to the graduating senior who has made significant contributions through active service in the Biology Department. The recipient of this award is selected by the Biology Department staff and recognizes the most deserving student for his/her invaluable assistance in working in the Department.

SFU CAMPUS RESOURCES*

CENTER FOR ACADEMIC SUCCESS (CAS)

1st Floor St. Francis Hall (472-3024); email cas@francis.edu

The Center for Academic Success (CAS) provides comprehensive academic support services for the Saint Francis University community. CAs seeks to empower students of all backgrounds to reach their educational goals by assisting them in developing academic skills, encouraging intellectual growth, and promoting learning as an explorative process. A collaborative effort between CAS and the University community furthers holistic student development, provides services in an environment of academic honesty, and promotes respect for cultural diversity.

Programs

- The Higher Education Equal Opportunity (ACT 101) Program
- Opportunities for Academic Success in Studies (OASIS) Program
- Study Acceleration: Gaining Excellence (SAGE) Program

Services

- Peer Tutoring & Writing Center
- Standardized Testing
- Supplemental Instruction
- Study Skills Workshops
- Academic Counseling
- Student-Athlete Development Center

WRITING CENTER

3rd Floor Library (471-1230)

The Writing Center is one of the many academic support services provided by the Academic Center for Enrichment. The purpose of the Writing Center is to guide students through the writing process so they become competent writers.

The Center is staffed by a Writing Center Specialist who works individually with students to:

- Discuss assignments, pre-writing, and text organization.
- Discover and generate ideas for papers, as well as learn methods for focusing ideas to suit the writer's purpose.
- Explore effective organization and methods for strengthening coherence.
- Examine methods for analyzing a writer's audience & anticipating needs of that audience.
- Develop specific and concrete ideas.
- Review rough drafts to identify strengths and weaknesses.
- Improve upon grammar, usage, sentence structure, punctuation, word choice, etc.

* Locations of these offices were correct upon publication of this handbook; these may occasionally change.

ACCESSIBILITY SERVICES

111 Francis Hall (472-3176)

Saint Francis University is a community that welcomes and embraces students with disabilities. Each disability is unique and for this reason, services are individually tailored to the needs of each student. Contact the Office with questions or for more detailed information on available services.

BUSINESS OFFICE

115 Raymond Hall (472-3006)

The Business Office distributes student worker paychecks, maintains and answers questions concerning student accounts, and cashes checks for up to 100 dollars. Students also go to the Business Office to sign Stafford and Perkins Student Loans checks.

COUNSELING CENTER

120 Francis Hall (472-3211)

The Counseling Center, located in Saint Francis Hall, provides confidential counseling to students, including individual, marital and group counseling. Students in need of services are encouraged to call for an appointment during regular office hours. The Center is staffed two evenings per week.

The Counseling Center offers consultation and crisis intervention services on a 24-hour basis. Resident students who desire to speak with a counselor after regular office hours should contact the Resident Assistant on duty. Commuter students should contact the Department of University Police at 814-472-3360 *(from a campus phone, dial 3360).*

Programming on relevant psycho-social and developmental issues is provided and sponsored by the Center throughout the year. Topics include stress management and relaxation training, sexuality, eating disorders, dating, substance abuse and family issues. Resource information on mental health issues, chemical dependency and health and wellness is available at the Center and is provided to students upon request.

If assistance is needed in arranging for mental health services in the community, the Center staff can assist students with referral to local treatment providers.

THE OFFICE OF DRUG & ALCOHOL SERVICES

The Office of Drug & Alcohol Services offers help to students who may have personal concerns with substance abuse or addiction, and provides education to students through dorm programs and events, as well as one-on-one counseling.

The University recognizes that alcohol and drug abuse is a serious issue and one that affects the social, emotional and educational development of many college students across the nation. This Office provides a comprehensive institution-wide drug prevention program that attempts to address this issue with an aggressive, pro-active and collaborative effort. This program involves education, prevention, treatment and alternative activities and is supported by students, faculty, and staff.

The Office of Drug & Alcohol Services, within the Residence Life department, is located in Francis Hall, Room 122. A certified Alcohol Counselor (CAC) is available for consultation and counseling. Students who have personal concerns with substance abuse or addiction are encouraged to contact the Office for an appointment. All clinical services are confidential.

With the aid of videos and discussion groups, counselors are available to conduct educational programs which promote knowledge and awareness of alcohol and drug issues. Students are encouraged to question, challenge, reflect, and/or share insights. The staff can also provide a link for students, staff, and faculty to contact community drug education experts. Students interested in hosting a program in a residence hall, Greek house, or classroom are urged to contact the Office of Drug & Alcohol Services. For students pursuing research projects on drug and alcohol issues, the Office maintains a library of resource materials including books, pamphlets, and videos.

FINANCIAL AID OFFICE

228 Padua (472-3010)

Saint Francis University believes every qualified person who desires higher education has the right to pursue it, regardless of financial status. Although the primary responsibility for financing an education lies with the student and his/her family, the University makes awards to supplement family funds whenever possible and aggressively seeks financial aid for those demonstrating need.

The University has a comprehensive program of awards to offset costs. Academic awards and scholarships are given for academic achievement, athletic potential, and financial need. Most federal, state, and institutional aid awards are based on financial need. Financial need is the difference between expected family contribution, as determined by a financial aid application, and University costs, which include tuition, fees, room and board, transportation, and personal expenses.

REGISTRAR'S OFFICE

318 Scotus (472-3009)

The Registrar is responsible for the proper functioning of the academic process from registration to graduation and beyond, and ensures the accuracy, care, and safety of all academic records. The Registrar's Office can assist students in all of the following:

- Changing home address
- Adjusting academic schedules
- Declaring intention to earn a minor
- Formally applying for a degree
- Ordering caps and gowns for graduation
- Sending of transcripts
- Dropping and adding courses
- Scheduling of courses
- Issuance of class schedules, grade reports, and transcripts
- Verification of enrollment
- Verification of eligibility of student-athletes

OFFICE OF CAREER SERVICES

203 Raymond (472-3019)

The Office of Career Services is designed to provide a wide range of services to assist students of all majors and backgrounds with job placement and career planning needs. The Office provides students, alumni and the community with the most up-to-date information in helping them assess their career goals and objectives. The Office strives to teach each student to take responsibility for his/her career, and teaches them the skills necessary for choosing a career that matches their skills, interests and personality. The Office also seeks alternative and creative methods of job placement by collaborating with various groups both on and off campus.

To launch students into their lifelong career journey, the Office of Career Services offers the following:

- Job placement assistance
- Job and internship search training
- Graduate and professional school placement assistance
- Career testing and counseling
- Career research and exploration

STUDENT SUCCESS TIPS

WORKING WITH YOUR PROFESSORS

Throughout your college years, you will encounter many different kinds of professors. Their teaching styles may vary greatly. However, most of them are genuinely interested in you as a student. Students and professors must work together toward common goals.

The following suggestions will help you achieve positive working relationships with your professors:

1. Be in your seat ready to begin work when the class starts. Don't expect a delayed entrance to make a favorable impression on anybody.
2. Be alert and attentive to all class activities. Don't alienate your professor by falling asleep or daydreaming in class.
3. Learn your professor's likes and dislikes concerning class discussion. Don't waste time with idle questions or quibbling over minor points.
4. Prepare your written assignments as neatly and accurately as possible. Don't let messy or careless work create the impression that you don't care.
5. Accept and learn from any oral or written corrections offered by your professors. Don't take such criticisms personally.
6. Form your own opinion about each of your professors. Don't allow the opinions of other students to prejudice your own judgment.
7. Work extra hard to compensate if you find that you dislike one of your professors. Don't complain, act aloof, or show hostility.
8. Avoid excuses and flattery when asking your professors for help. Don't expect your professors to devote extra time with you unless you are straightforward with them.
9. Accept responsibility for your mistakes. Don't blame your professors.

Adapted from: Brown, William F., and Wayne H. Holtzman. A Guide to College Survival. Iowa City, Iowa: The American College Testing Program, 1987.

WORKING WITH YOUR ACADEMIC ADVISOR

Academic advising is an ongoing process rather than a single or isolated appointment or meeting. It involves a developing relationship between you and your advisor. The relationship is meant to help you during your college career to achieve your educational goals, career goals, and personal goals. Academic advising is designed to help you accomplish those goals through an awareness of, understanding of, and use of all of the resources available to you both at your college and in the community where your college is located. In the academic advising relationship, your advisor will help you identify and accomplish those goals by seeing that you acquire the necessary skills and attitudes.

The development and nurturing of the student-advisor relationship is the responsibility of both you and your advisor. The association is much more than an expert/novice relationship where the advisor bestows great knowledge and information to you. Both you and the advisor will learn and develop as the advising relationship grows and matures. Remember that an advisor is just that – an individual to advise, counsel, and guide your development. **The ultimate responsibility for a successful advising relationship and college career is *yours*.** It is your job to initiate and maintain the relationship.

Here are some suggestions for working effectively with your academic advisor:

1. *Get to know yourself first.* How and why did you choose SFU? How comfortable are you with your decision of an academic major?
2. *Get to know your institution and its academic environment.* Become familiar with the courses required of you, rules, policies, procedures, etc.
3. *Take the initiative to get to know your advisor.* Meet with your advisor periodically, not only when you need something. The better your advisor knows you, the more productive your time together will be, and more importantly, the more you'll get in return.
4. *When at all possible, make an appointment to see your advisor.* Most advisors have busy schedules and their free time is limited. If you make an appointment in advance, your advisor will be expecting you and can give your concerns the attention they deserve.
5. *Prepare for your appointments with your advisor.* You'll get more out of your meeting with your advisor if you prepare in advance. Here are some things you can do to prepare:
    - Have your questions ready.
    - Read over relevant sections of the SFU College Catalog, course listings, etc.
    - If you are meeting with your advisor for scheduling, have a proposed schedule with alternate choices prepared.
        - Bring everything you need for the meeting. Bring the college catalog, course listing, schedule cards, a pen and pencil, your list of questions, etc.
        - Be on time for your appointment! If for some reason you cannot make the appointment, call your advisor and reschedule.
6. *Familiarize yourself with other campus resources.* Regardless of how helpful your advisor may be, additional people and programs on campus can enrich your academic and extracurricular lives. Don't fail to take advantage of these.

Adapted from: Gardner, John N., and A. Jerome Jewler. College is Only the Beginning: A Student Guide to Higher Education. Belmont, CA: Wadsworth Publishing Company, 1989.

CLASSROOM ETIQUETTE

Faculty members work to effectively manage the classroom environment and promote conditions that will enhance student learning. However, students too must also actively strive to foster a productive learning environment. One way in which students can do this is by exhibiting appropriate classroom behaviors. Below is a list of general expectations for proper classroom etiquette.

1. Be on time for class.
2. If you absolutely must arrive late, enter discreetly, with a minimum of disruption to others.
3. Be ready to begin work when class is scheduled to begin—take care of all personal business (finding a stapler, making phone calls, getting a drink, using the bathroom) ahead of time.
4. Bring all necessary materials—course texts and documents, notebook, pen or pencil.
5. Turn off electronics like cell phones, beepers, wrist watches, etc. before class begins.
6. Respect your classmates and the instructor at all times. Do not talk with others while the instructor or another student is speaking.
7. Do not eat or sleep in class.
8. All SFU classrooms are tobacco-free. This means consumption of tobacco products is prohibited in the buildings at all times.
9. Focus on the class material during class time. Sleeping, doing work for another class, reading mail, checking email, and surfing the web are unacceptable and disruptive.
10. Students are expected to use their laptops and handheld computing devices only for purposes related to the class in progress. Examples of inappropriate computer use include reading or sending email, playing games, browsing the web for unrelated purposes, and typing unrelated materials.
11. Actively participate in class discussions. Listen to your instructor *and* your fellow students. Wait until others are done talking before you comment or ask questions.
12. Do not dominate discussion; listening is every bit as important as talking. Allow others to give their input. Do not stray from the topic of discussion.
13. Do not pack bookbags or backpacks until the instructor has dismissed the class.
14. Remain in class until the scheduled ending time. If you must leave the classroom early, inform the instructor in advance and try to sit near the door to make less of a disturbance when leaving.

STUDYING TIPS

- ***Make and keep a study schedule.*** Set aside certain hours each day for class assignments. Plan a definite time for studying each day. This will discourage procrastination and prevent that pile-up of work. Keep the same schedule regularly day to day. The amount of time needed for study will vary with the individual student and the courses on his or her schedule.
- ***Study in a suitable place -- the same place every day.*** Is concentration one of your study problems? Experts state that the right surroundings improve concentration ability. Also, study desks/tables should be located in a quiet place -- free from distractions.
- ***Organize all material before starting.*** Your study area should have certain standard equipment -- paper, pen, resource books, calculator, etc. This will eliminate unnecessary interruptions.
- ***Don't wait for inspiration to strike -- it probably won't.*** We can learn a lesson about studying from observing an athlete. Can you imagine seeing an athlete who is training for a mile run sitting on the field waiting for inspiration to strike before beginning to practice? Like an athlete, it is necessary to get in training for exams by doing things on a regular basis.
- ***Keep an organized notebook.*** Research shows that there's a definite relationship between the organization of a student's notebook and the grades he/she makes. Set aside a special section for each course.
- ***Keep a careful record of assignments.*** Why lose time phoning all over town or campus to find someone who knows the assignment? Write it down -- in detail -- in a designated place in your notebook. Knowing what is expected and when you are expected to do it is the first step toward completing the assignment.
- ***Use "trade secrets" for successful study.*** For example:
    - Flash Cards. Use a 3" x 5" card to learn specialized vocabulary. On the front write the term; on the back, write the definition or an important fact about that term. Carry your flash cards with you. Periodically take them out and quiz yourself.
    - Divided Page. Draw a dividing line down the center of a sheet of notebook paper. Write important questions on the left side and the answers on the right. Use the "self restriction" method of study. Cover the right-hand side and try to give the answer. Then check and recheck until you're sure you know the material.
    - Cover Card. As you are studying, look over your notebook or textbook and read what you are trying to memorize. Use the cover card to conceal what you've just read -- try reciting or writing the facts from memory. Check until you are sure you have mastered the facts.
- ***Insure against forgetting -- take good lecture and text notes.*** Learn to take lecture and text notes efficiently as your instructors stress important points in class and as you study your assignments. Good notes are imperative for just-before-test reviewing. Without notes, you will often need to reread the whole assignment before a test.
- ***How can you remember what you've studied?*** One secret of remembering is over learning. Psychologists tell us that the secret of learning for the future is over learning. Over learning is continuing your study after you have learned the material well enough to barely recall it.

- ***Frequent reviews pay off*** -- in knowledge, grades and credits. Without review, the average student can forget 80% of what was read -- in just two weeks! Your first review should come very shortly after you study material for the first time.
- ***Review to refresh your memory.*** Every time you study, spend ten minutes in review of previous assignments. These refresher shots are the secret for long-term memory. This habit of frequent review also results in less time needed for study for a major test.
- ***Take study breaks.*** After studying about forty minutes, take a five minute break. This refreshes your mind so that you can concentrate better and finish faster.
- ***Set time limits to help focus your concentration.*** Setting a stopping time at night will encourage hard work in anticipation of being through by ten o'clock or whatever time you set. Sometimes you may even beat the clock. The increased impetus helps you concentrate.
- ***Don't cram for hours the night before a test.*** Instead, distribute your study in half-hour segments over a period of days in advance of the exam.
- ***Make connections.*** Since learning is cumulative, new ideas must be incorporated with previous learning from lectures, readings, and lab experiments. You have to continuously make the connections and associations in your own mind. Putting it all together is easier if you schedule time daily to read, to think, to reflect, to review. Improved learning is the natural result of this approach to using your time.

Adapted from: http://www.und.edu/dept/ULC/rf-stps.htm
(University of North Dakota's Learning Center On-Line Information)

TEST-TAKING TIPS

Be on time. Arrive early so you can organize yourself and get ready. Find a good seat and get comfortable.

Manage your anxiety. Stay calm and in control. Use relaxation techniques to reduce tension and help yourself relax.

Pay particular attention to any verbal directions that you are given. Sometimes the instructor will make changes or corrections that aren't included in the written directions. It could be costly if you miss such verbal instructions.

Put your name on the paper. Your instructor cannot give you credit unless he or she knows to whom the test paper belongs.

Write down things you have memorized. Get them off your mind early on. If you begin by writing them down in the margins on your test paper, you won't have to worry about forgetting them because they'll be written down right in front of you.

Scan over the entire exam. See how many and what types of questions are on the test. Notice the point value for each question. Develop a plan for how you will use the time available for the test. Decide how much time you should devote to each question and how much time you'll need for review. Then follow your plan.

Read the directions slowly, carefully, and completely. Make sure you know what is expected from you.

Ask your instructor for clarification. If there is anything that is not clear to you, ask questions right away. Don't begin a test with any doubt in your mind.

Answer the easiest questions first. This way you'll be sure to get credit for the ones you know. This will give you the experience of success and will help reduce anxiety. Also, this is a great warm-up device which will build your momentum and your confidence. Don't spend a lot of time on any one question. If you are unsure about a question, mark it and go back to it later.

Go back and do the moderately difficult questions.

Use memory techniques when you're stuck. If your recall on a certain point is blocked, try using something that may stimulate your memory. Try remembering something that's related. Mnemonic devices and mind maps may be especially helpful.

"Time and weight check." See how much time you have left. Are you pacing yourself according to the time plan you initially devised? *Remember:* Put your time where the points are.

Look for answers in other test questions. A word or fact that escapes your memory can sometimes be found in another question within the test itself. You can also use other questions to stimulate your memory.

Do your own work. Be careful not to give the impression of cheating. Do your own work and do not give any help to others.

Tackle the difficult questions. Read each question carefully and try your best in answering them.

Use the full time allowed to complete the test. Don't rush. Take your time. Answer all the questions that you can. Don't be disturbed by other students finishing before you do.

Check your work. Leave time to check, edit, and proofread your work. Look for careless mistakes. Make sure you answered all the questions -- this is especially important since you skipped around while completing the test. Be careful about changing answers. Your first instinct is usually best. Don't change your answer unless you are sure your other choice is correct. If you think your first answer is wrong because you misread the question, then change your answer.

TIPS FOR DIFFERENT TYPES OF TESTS

MULTIPLE-CHOICE QUESTIONS

Stems, Options, and Distractors

Multiple-choice questions are usually either incomplete statements followed by possible ways the statements may be completed, or they are questions followed by possible answers.

The first part of a multiple-choice question is called the *STEM*.

The choices that are given for the answers are called *OPTIONS.*

Options are written so that one is the correct answer and the others are distractors.

Eliminate the Distractors

The basic strategy for answering a multiple-choice question is to eliminate the distractors and to select the correct answer, the option that is not a distractor. One way to locate distractors is to analyze a multiple-choice question as though it is a series of true-false questions.

Use Common Sense and Sound Reasoning

Also, you may sometimes be able to select the correct answer to a multiple-choice question by using common sense, sound reasoning, experiences you have had, and information you know.

Absolute Statements

When you answer multiple-choice questions, keep in mind that absolute statements tend to be distractors.

Unfamiliar-Looking Terms or Phrases

Unfamiliar-looking terms or phrases are seldom the correct answers to college test questions.

Jokes and Insults

Jokes and insults are seldom correct answers to multiple-choice questions.

"All of the Above"

When one of the options for a multiple choice question is "all of the above," it is likely to be the correct answer.

High and Low Numbers

When the options for a multiple-choice question are a series of numbers, the highest and lowest numbers tend to be distractors.

Two Similar-Looking Answers

When two options to a multiple-choice question are similar looking, the correct answer is often one of the two similar-looking options.

TRUE-FALSE QUESTIONS

Assume Statements are True

When you answer a true-false question, assume that it is true unless you can determine that it is false. This strategy will help you to arrive at accurate decisions efficiently. Also, there is a slight tendency for true-false tests to include more true statements than false statements. The reason for this seems to be that it is easier to write true statements than it is to write false statements that appear to be true. As a result, when you must guess at the answer to a true-false question, you usually have an advantage when you guess that it is true.

All Parts of Statements Must be True

A second strategy for true-false questions is to keep in mind that for a statement to be true, all parts of it must be true. As a result, the more facts that are included in a statement, the more likely it is to be false. A statement does not need to be long to contain several parts.

Reasons Tend to be False

You may find it helpful to know that true-false questions tend to be false when they state a reason. Be alerted by words such as "because," "reason," and "since," which indicate that a reason is stated in the question.

MATCHING QUESTIONS

Use one list as the starting point for making all matches.

If one list contains longer statements than the other list, use it as the starting point for making matches.

Cross out items as you match them.

FILL-IN QUESTIONS

Decide what type of answer is required and give that type of answer.

Keep in mind that the word "an" before a write-on line may be a clue that the answer begins with a vowel sound such as those represented by A, E, I, or U.

ESSAY QUESTIONS

Understand the direction words.

Answer all parts of the questions.

Write well-organized answers.

Write complete answers.

Proofread your answers.

TERMS COMMONLY USED IN ESSAY QUESTIONS

The following words are commonly found in essay test questions. Be sure you know them well.

Analyze	Break the subject into separate parts and explain each part
Compare	Examine 2 or more things, identify and emphasize similarities but also discuss differences
Contrast	State differences
Criticize	Make judgments; analyze the good points and the limitations
Define	Give a clear, concise meaning. Specify unique qualities and characteristics
Describe	Give a detailed account of the subject listing characteristics, qualities, and parts
Discuss	Consider in detail and debate the pros and cons of an issue
Enumerate	List relevant points

Evaluate	Discuss advantages/ disadvantages, good points/bad points
Explain	Give reasons for; make clear; interpret
Identify	Give correct description of events, places, or persons
Illustrate	Explain clearly by giving concrete examples and/or using diagrams
Interpret	Explain; provide examples; comment upon; describe relationships; solve
Justify	Provide reasons for; give evidence or facts to support a position
Outline	Provide main points and vital details in an organized fashion
Prove	Give evidence; provide logical reasoning with examples; demonstrate validity
Relate	Point out connections/associations to show how things interconnect
State	Explain precisely by giving a clear, brief account of the high points
Summarize	Briefly provide main points or facts, include conclusions
Trace	Follow the course of; describe sequence of events or the progress of a subject or an event

Source: http://www.francis.edu/centerinst/ACE/StudySkills/TestTaking.shtml
(Saint Francis University Academic Center for Enrichment Web Site)