



To: Curriculum and Academic Program Committee

From: Elizabeth Langland, Dean, New College of Interdisciplinary Arts and Sciences

A handwritten signature in cursive script, appearing to read 'Elizabeth Langland'.

Date: May 4, 2011

RE: BA in Natural Sciences with a concentration in secondary education

I am pleased to support strongly the proposed BA in Life Sciences with a Concentration in Secondary Education. New College is very happy to be collaborating with Mary Lou Fulton Teachers' College in offering what promises to be an excellent opportunity for students to pursue both an interest in science and an interest in teaching. I echo Dean Koerner in anticipating that this new degree and concentration will enable ASU to increase the number and quality of secondary science teachers.

I recommend this proposal without reservation.

New College of Interdisciplinary Arts and Sciences  
Office of the Dean

Mailing Address: PO Box 37100, Phoenix, AZ 85069-7100  
Street/Shipping Address: 4701 W. Thunderbird Road, Glendale, AZ 85306-4908  
(602) 543-7000 Fax: (602) 543-4565  
newcollege@asu.edu  
<http://newcollege.asu.edu>

## ESTABLISHING UNDERGRADUATE CONCENTRATIONS

### DEFINITION

*These are the minimum requirements for approval. Individual undergraduate concentrations may have additional requirements.*

A concentration is a formalized selection of courses within a major.

An undergraduate concentration:

- Requires a minimum of 15 semester hours of which at least 9 semester hours must be upper division. Specialized concentrations (e.g. BIS Concentrations) may have additional or different requirements.
- Is offered by a single unit and is intended exclusively for students pursuing that particular major. If a concentration consists of courses from more than one college the approval of each college Dean is required.

### PROPOSAL PROCEDURES CHECKLIST

Before academic units can advertise undergraduate concentrations or include them in their offerings as described in the university catalogs, they must be recommended for approval by the Curriculum and Academic Programs Committee and approved by the Executive Vice President and Provost.

A complete proposal should include:

1. A supporting letter from the chair of the academic unit verifying that:
  - The proposed concentration has been reviewed and has received faculty approval through appropriate governance procedures in the unit.
  - The unit has the resources to support the concentration as presented in the proposal, without impacting core course resources.
2. A supporting letter from the office of the supervising dean verifying that the concentration has been reviewed and has received approval through appropriate governance procedures in the college.
3. A supporting letter from each college/school dean from which individual courses, or the entire concentration, are taken.
4. A statement concerning demand for the program (student/community/market).
5. A description of the requirements for this concentration. Be specific in listing required courses and specify the total minimum number of hours required for the concentration.
  - Are any new courses required? If so, provide course syllabi and Proposal for Curriculum Action forms.
6. A list of the primary faculty participants.
7. A minimum residency requirement: How many hours of the concentration must be ASU credit?
8. Please prepare and attach a Major Map.
9. A completed Appendix document. This information is to be used during the implementation phase to ensure this program appears correctly and completely on Degree Search.
10. Attach other information that will be useful to the review committees and the Office of the Provost.

**DEGREE PROGRAM INFORMATION**

College/School(s) offering this degree: New College

Unit(s) within college/school responsible for program: Mathematical and Natural Sciences

If this is for an official joint degree program, list all units and colleges/schools that will be involved in offering the degree program and providing the necessary resources: NA

Proposed Degree Name: Life Sciences Concentration in Secondary Education

Undergraduate Degree Type: BA-Bachelor of Arts

If Degree Type is Other, provide proposed degree type:

and proposed abbreviation: Life Sci

Proposed title of major: Bachelor of Arts in Life Sciences

Is a program fee required? Yes  No

Requested effective term: Fall and year: 2011

(The first semester and year for which students may begin applying to the program.)

**PROPOSAL CONTACT INFORMATION**

(Person to contact regarding this proposal)

Name: Pamela A. Marshall

Title: Associate Professor

Phone: 602-543-6143

email: Pamela.Marshall@ASU.edu

**DEAN APPROVAL**

This proposal has been approved by all necessary unit and College/School levels of review, and the College/School(s) has the resources to offer this degree program. I recommend implementation of the proposed degree program. (Note: An electronic signature, an email from the dean or dean's designee, or a PDF of the signed signature page is acceptable.)

College Dean name: Elizabeth Langford

College Dean signature

Date: 4/29/2011

College Dean name:  
(if more than one college involved)

College Dean signature

Date:

## ESTABLISHING UNDERGRADUATE CONCENTRATIONS

### DEFINITION

*These are the minimum requirements for approval. Individual undergraduate concentrations may have additional requirements.*

A concentration is a formalized selection of courses within a major.

An undergraduate concentration:

- Requires a minimum of 15 semester hours of which at least 9 semester hours must be upper division. Specialized concentrations (e.g. BIS Concentrations) may have additional or different requirements.
- Is offered by a single unit and is intended exclusively for students pursuing that particular major. If a concentration consists of courses from more than one college the approval of each college Dean is required.

### PROPOSAL PROCEDURES CHECKLIST

Before academic units can advertise undergraduate concentrations or include them in their offerings as described in the university catalogs, they must be recommended for approval by the Curriculum and Academic Programs Committee and approved by the Executive Vice President and Provost.

A complete proposal should include:

1. A supporting letter from the chair of the academic unit verifying that:
  - The proposed concentration has been reviewed and has received faculty approval through appropriate governance procedures in the unit.
  - The unit has the resources to support the concentration as presented in the proposal, without impacting core course resources.
2. A supporting letter from the office of the supervising dean verifying that the concentration has been reviewed and has received approval through appropriate governance procedures in the college.
3. A supporting letter from each college/school dean from which individual courses, or the entire concentration, are taken.
4. A statement concerning demand for the program (student/community/market).
5. A description of the requirements for this concentration. Be specific in listing required courses and specify the total minimum number of hours required for the concentration.
  - Are any new courses required? If so, provide course syllabi and Proposal for Curriculum Action forms.
6. A list of the primary faculty participants.
7. A minimum residency requirement: How many hours of the concentration must be ASU credit?
8. Please prepare and attach a Major Map.
9. A completed Appendix document. This information is to be used during the implementation phase to ensure this program appears correctly and completely on Degree Search.
10. Attach other information that will be useful to the review committees and the Office of the Provost.

## ESTABLISHING UNDERGRADUATE CONCENTRATIONS

### DEGREE PROGRAM INFORMATION

College/School(s) offering this degree: New College

Unit(s) within college/school responsible for program: Mathematical and Natural Sciences

If this is for an official joint degree program, list all units and colleges/schools that will be involved in offering the degree program and providing the necessary resources: NA

Proposed Degree Name: Life Sciences Concentration in Secondary Education

Undergraduate Degree Type: BA-Bachelor of Arts

If Degree Type is Other, provide proposed degree type:

and proposed abbreviation: Life Sci

Proposed title of major: Bachelor of Arts in Life Sciences

Is a program fee required? Yes  No

Requested effective term: Fall and year: 2011

(The first semester and year for which students may begin applying to the program.)

---

### PROPOSAL CONTACT INFORMATION

(Person to contact regarding this proposal)

Name: Pamela A. Marshall

Title: Associate Professor

Phone: 602-543-6143

email: Pamela.Marshall@ASU.edu

### DEAN APPROVAL

This proposal has been approved by all necessary unit and College/School levels of review, and the College/School(s) has the resources to offer this degree program. I recommend implementation of the proposed degree program. (Note: An electronic signature, an email from the dean or dean's designee, or a PDF of the signed signature page is acceptable.)

College Dean name:

College Dean signature \_\_\_\_\_ Date: \_\_\_\_\_

College Dean name:

(if more than one college involved)

College Dean signature \_\_\_\_\_ Date: \_\_\_\_\_

**Proposed title of major:** Bachelor of Arts in Life Sciences

4. This request adds a concentration of secondary education courses to an existing BA in Life Sciences offered by the Division of Mathematical and Natural Sciences in the New College. Adding this concentration will allow students to take the courses necessary for certification in Arizona as a highly qualified teacher. This degree plan allows flexibility to students who wish for a deep content knowledge of Life Sciences but also want to teach at the secondary level after graduation. Students can achieve both with this degree plan, as it is able to be completed in 120 hours. There is high demand for highly qualified teachers in STEM fields and this degree will allow students to choose this career path with ease.

The difference between this degree and the existing BAE is that this degree gives students more deep content knowledge, including more chemistry, more biology courses, a choice of a year of physics or physics and a geology course. This program requires fewer education courses than the existing BAE in Biological Sciences (Secondary Education) program requires, as well. This sequence of courses will allow a student to apply for teaching credentials and be well suited for teaching science with a content-rich degree. One of the methods to become a highly qualified teacher in Arizona is “A major or 24 credit hours in the core academic subject area” (<http://www.ade.az.gov/asd/hqtp/teacher.asp>). Because this is a degree in a content major, a BA degree in Life Sciences with a concentration, this degree program allows the student to apply immediately to become highly qualified in Arizona.

A student should consider whether their career goals would be best served by having a major in biological sciences or in education. In the upcoming reformed curriculum, the BAE will include a two semester student teaching while the BA would offer one semester of student teaching. Students who complete the reformed BAE in secondary education will take 9 credits of Teachers College signature course work – Health Literacy, Civics and the Law, and Sustainability Science – in addition to their methods courses. Students completing the BA with a Concentration in Secondary Education will not be required to take the signature courses. Students who complete the BA in Life Sciences with a Secondary Education concentration will have added flexibility should their career goals change, as they will have a science degree. Additionally students who are unsure if they are interested in teaching but want to major in Life Sciences can begin the concentration knowing that if they do not wish to pursue a career in teaching, they are still on track to complete a Life Sciences degree. Either pathway, when successfully completed and required tests successfully passed, should prepare a student for an institutional recommendation for secondary education certification.

Students who are choosing between this BA and the existing BAE will be queried as to their ultimate career goals. Those who are unsure as to whether or not teaching is their ultimate goal but would like to have this option will be steered towards the BA with secondary education concentration as this degree has added flexibility as it is a science content major. Students who declare their intent to pursue a teaching career will be advised into one of the two degrees based upon their personal goals: if they wish more science content, the BA with concentration will be suggested; however, if the student wishes more educational schooling, the BAE will be suggested. A student who has a career goal potentially of administration in secondary education, for example, will be steered towards the BAE. It is ultimately a personal choice of the student as both paths will lead to teaching credentials.

The long term plan is for these two options to co-exist. The BAE in Secondary Education will not be phased out. The intention of Mary Lou Fulton Teachers' College is to advertise these options, the differences between them, and allow the student to choose the one that best suits his or her main goals. Of importance, the option for linking licensure to a content major comes as a result of a mandate from President Crow.

5. This concentration requires the following courses, which will lead to a deep knowledge of content and pedagogy and the ability of a student to apply for teaching credentials in Arizona:

BA in Life Sciences (West):

BIO 181 General Biology I (4)

BIO 182 General Biology II (4)

BIO 320 Fundamentals of Ecology (3)

LSC 347 Fundamentals of Genetics (3)

BIO 353 Cell Biology (3)

CHM 113 General Chemistry I (4)

CHM 116 General Chemistry II w/Qualitative Analysis (4)

MAT 170 Precalculus (3) or higher

ONE OF THE FOLLOWING SEQUENCES

CHM 231 Elementary Organic Chemistry Lecture (3)

CHM 235 Elementary Organic Chemistry Lab (1)

OR

CHM 233 General Organic Chemistry I Lecture (3)

CHM 237 General Organic Chemistry I Lab (1)

CHM 234 General Organic Chemistry II Lecture (3)

CHM 238 General Organic Chemistry II Lab (1)

ONE OF THE FOLLOWING SEQUENCES

PHY 101 Introduction to Physics (4)

GLG 101 Introduction to Geology I (Physical) (3)

GLG 103 Introduction to Geology Lab (1)

OR

PHY 111 General Physics I (3)

PHY 113 General Physics I Lab (1)

PHY 112 General Physics II (3)

PHY 114 General Physics II Lab (1)

15 credit hours selected from 300-level and 400-level courses with the prefixes BCH, BIO, LSC, MIC, or PLB.

No more than 4 credit hours may be from the following courses:

LSC 305 Biology Behind the Crime Scene (4)

OFFICE OF THE EXECUTIVE VICE  
PRESIDENT AND PROVOST OF  
THE UNIVERSITY

- LSC 310 Natural History of Arizona (3)
- LSC 311 Field Natural History (1)
- LSC 365 The Human Organism (3)
- IAS415 Life in the Universe (3)
- IAS416 Black Holes and Beyond (3)

No more than 3 credit hours may be from the following courses:

- LSC 394 Careers in the Natural and Health Sciences (1)
- LSC 484 Internship (1-3)
- LSC 499 Directed Research (1-3)

Although students may take any courses as their upper level major electives, for best coverage of topics needed to perform job duties of high school biology teacher, we highly recommend:

- BIO345 Organic Evolution
- BIO360 Animal Physiology and LSC359/BIO361 Animal Physiology lab
- PLB310 Flora of Arizona

**Courses Required for Secondary Certification: total minimum number of hours is 44; no new courses are required.**

Course	Catalog Description	Rationale	Credits	Course on Current Map
SPE 222: Orientation to Exceptional Learner (SB, C)	Includes gifted, mildly handicapped, severely handicapped, and the bilingual/multicultural exceptional child.	Meets federal guidelines on preparing all educators work with students with exceptionalities	3	Social & Behavioral Science
EDT 180: Computer Literacy (CS)	Introduces personal computer operations and their place in society. Problem-solving approaches using databases, spreadsheets, and word processing. Credit is allowed for only EDT 180 or 321.	Meets CS requirement and has an educational focus.	3	Computer/Statistics/Quantitative Applications (CS)



BLE 220: Foundations of SEI	Examines current educational practices and historical legal issues. Prepares teacher candidates with a provisional Structured English Immersion endorsement.	First of two required state approved courses on Structured English Immersion (SEI).	3	Elective (H if not already completed)
TEL 315: Child and Adolescent Development	Physical, cognitive, social, and emotional development during childhood and adolescence; developmentally appropriate principles and practices to facilitate development for all students.	Meets Arizona Department of Ed required course on human development	3	Elective
TEL 311: Instruction and Management	Planning and delivering instruction, organizing and managing classrooms, and making adaptations for English language learners and students with special needs. Fee.	Addresses Arizona Department of Education required 30 semester hours of education courses that address knowledge and skills described in professional teaching standards such as learning theory, classroom management, methods and assessment.	3	Elective
RDG 323: Literacy Process in Content Area	Principles and practices for planning subject matter units of instruction that explicitly address learning with texts across academic disciplines.	Addresses Arizona Department of Education required 30 semester hours of education courses that address knowledge and skills described in professional teaching standards such as learning theory, classroom management, methods and assessment.	3	Elective

BLE 407: Structured English Immersion for SED Students	Examines foundations, assessment, English language learner proficiency standards, and strategies (including SEI) for the 7-12 classroom.	Second of two required state approved courses on Structured English Immersion (SEI).	3	Elective
BIO 480: Methods of Teaching Biology	Methods of instruction, experimentation, organization, and presentation of appropriate content in biology	Addresses Arizona Department of Education required 30 semester hours of education courses that address knowledge and skills described in professional teaching standards such as learning theory, classroom management, methods and assessment.	3	Upper division BIO Course
SED 322: Classroom Leadership	Theories and practices for managing and maintaining secondary classrooms for learning; strategies for home/school communication; and leadership roles for teachers.	Addresses Arizona Department of Education required 30 semester hours of education courses that address knowledge and skills described in professional teaching standards such as learning theory, classroom management, methods and assessment.	3	Upper division Elective
SPE 417: Inclusion Practices for Secondary Educators	Applies curricular practice and how preservice teachers work with students with special needs in middle and secondary levels.	Meets federal guidelines on preparing all educators work with students with exceptionalities	3	Upper division Elective

BIO 482: Advanced Methods of Teaching Biology	Design, delivery, and evaluation of student-centered, inquiry-based lessons for high school biology students. Learning cycle	Addresses Arizona Department of Education required 30 semester hours of education courses that address knowledge and skills described in professional teaching standards such as learning theory, classroom management, methods and assessment.	3	Upper division BIO Course
SED 396: Field Experience I	Field Experience I Enroll requirements: Pre-requisites: Admission to Professional Teacher Preparation Program	Required clinical experience	1	
SED 397: Field Experience II	Applies course content in a secondary school setting. Emphasizes observation, pupil management, planning and delivering instruction, and assessment. fee Enroll requirements: Pre-requisites: Admission to Professional Teacher Preparation Program.	Required clinical experience	1	
SED 496: Field Experience III	Applies course content in a secondary school setting. Emphasizes observation, pupil management, planning and delivering instruction, and assessment. fee Enroll requirements:	Required clinical experience	1	

	Pre-requisites: Admission to Professional Teacher Preparation Program.			
SED 478: Student Teaching	Practice of teaching. Relationship of theory and practice in teaching. Fee. Enroll requirements: Pre-requisites: Admission to Professional Teacher Preparation Program	Required clinical experience	8-12	Upper division Elective

6.

<b>Faculty</b>	<b>How their Expertise Fits into the Degree</b>
Becky Ball, PhD, Assistant Professor	New hire in Environmental science
Thomas Cahill, PhD, Assistant Professor	Teaches chemistry
Charles Deutch, PhD, Associate Professor	Teaches Cell Biology and Biochemistry
Chad Johnson, PhD, Assistant Professor	Teaches Animal Behavior
Peter Jurutka, PhD, Associate Professor	Teaches Biochemistry and Molecular Genetics
Pamela A. Marshall, PhD, Associate Professor	Teaches Genetics
Susie Sandrin, Ph.D., Clinical Faculty	Teaches chemistry and environmental science courses
Todd Sandrin, PhD, Associate Professor	Teaches freshman biology, Microbiology
Udo Savalli, PhD, Lecturer	Teaches freshman biology, Vertebrate Zoology
Francisco Solis, PhD, Associate Professor	Teaches physics
Brian Sullivan, Ph.D., Professor	Teaches Natural History and Herpetology
Ken Sweat, PhD, Senior Lecturer	Teaches freshman biology, Biometry
Carl Wagner, PhD, Assistant Professor	Teaches Organic Chemistry

<b>Mary Lou Fulton Teachers College Faculty</b>	<b>Role in Concentration</b>
Irina Okhremtchouk	Secondary education
Charlotte Frambaugh-Kritzer	Secondary education
Peter Rillero	Science education
David Meltzer	Science education
Colleen Megowan	Science education
Dale Baker	Science education
Lee Hartwell	Science education
Leslie Irwin	Multicultural education
Gustavo Gonzalez	Linguistic diversity
Yolanda De La Cruz	Second language learners

7. Minimum residency requirement: 22 hours

**APPENDIX - PROPOSAL TO ESTABLISH A NEW UNDERGRADUATE CONCENTRATION**

(This information is used to populate the Degree Search/catalog website.  
Please consider the student audience in creating your text.)

**1. Program Description (150 words maximum)**

**The intricate connections among biology, chemistry and physics form the basis of the life sciences curriculum. The B.A. program emphasizes interdisciplinary learning of the life and physical sciences, emphasizing the connectedness among disciplines. Addition of the Concentration in Secondary Education to the BA allows a student to apply for teaching credentials in Arizona as a highly qualified teacher.**

**Contact and Support Information**

Office Location (Building & Room): CLCC318

Campus Telephone Number: 3-6143

Program email address: Pamela.marshall@asu.edu

Program website address:

**2. Additional Program Description Information**

A. Additional program fee required for this program? Yes  No

B. Does this program have a second language requirement? Yes  No

**3. Career Opportunities & Concentrations** Provide a brief description of career opportunities available for this degree program. If program will have concentrations, provide a brief description for each concentration.

Students have a wide variety of career options including: secondary school teaching, health professional programs, graduate school, laboratory research, science writing, environmental management and conservation, and science advisors to businesses and government.

**4. Additional Admission Requirements** If applicable list any admission requirements (freshman and/or transfer) that are higher than and/or in addition to the university minimum undergraduate admission requirements.)

None.

**5. Keywords** List all keywords used to search for this program. Keywords should be specific to the proposed program.

Program keywords:

Education, biology, chemistry, ecology, environmental studies, conservation, research, medicine, dentistry, pharmacy, pre-med, physics, genetics, biotechnology, crime lab, forensics, field studies, wildlife, pre-vet, veterinarian, bioscience, botany, plants, microbiology, cell biology

Career keywords:

Science teacher, Physician, Pharmacist, Veterinarian, Doctor, Medical Professional, PA, Biologist, Ecologist, Chemist, Geneticist, Genetic Counselor, Forensics, Research Specialist, Lab Technician, Microbiologist

6. **Advising Committee Code** List the existing advising committee code associated with this degree.
  
7. **Minimum Math Requirement** List the minimum math course required to satisfy this degree.  
MAT 170

OFFICE OF THE EXECUTIVE VICE  
PRESIDENT AND PROVOST OF  
THE UNIVERSITY

**8. Area(s) of Interest**

A. Select one (1) primary Area of Interest from the list below that applies to this program.

- |   |   |
|---|---|
| <input type="checkbox"/> <u>Architecture, Construction &amp; Design</u>               | <input type="checkbox"/> <u>Engineering &amp; Technology</u>                |
| <input type="checkbox"/> <u>Artistic Expression &amp; Performance</u>                 | <input type="checkbox"/> <u>Environmental Issues &amp; Physical Science</u> |
| <input checked="" type="checkbox"/> <u>Biological Sciences, Health &amp; Wellness</u> | <input type="checkbox"/> <u>Interdisciplinary Studies</u>                   |
| <input type="checkbox"/> <u>Business, Management &amp; Economics</u>                  | <input type="checkbox"/> <u>Languages &amp; Cultures</u>                    |
| <input type="checkbox"/> <u>Communication &amp; Media</u>                             | <input type="checkbox"/> <u>Law &amp; Justice</u>                           |
| <input type="checkbox"/> <u>Computing &amp; Mathematics</u>                           | <input type="checkbox"/> <u>Social Science, Policies &amp; Issues</u>       |
| <input type="checkbox"/> <u>Education &amp; Teaching</u>                              |   |

B. Select **any** additional Areas of Interest that apply to this program from the list below.

- |  |   |
|--|---|
| <input type="checkbox"/> <u>Architecture, Construction &amp; Design</u>    | <input type="checkbox"/> <u>Engineering &amp; Technology</u>                |
| <input type="checkbox"/> <u>Artistic Expression &amp; Performance</u>      | <input type="checkbox"/> <u>Environmental Issues &amp; Physical Science</u> |
| <input type="checkbox"/> <u>Biological Sciences, Health &amp; Wellness</u> | <input type="checkbox"/> <u>Interdisciplinary Studies</u>                   |
| <input type="checkbox"/> <u>Business, Management &amp; Economics</u>       | <input type="checkbox"/> <u>Languages &amp; Cultures</u>                    |
| <input type="checkbox"/> <u>Communication &amp; Media</u>                  | <input type="checkbox"/> <u>Law &amp; Justice</u>                           |
| <input type="checkbox"/> <u>Computing &amp; Mathematics</u>                | <input type="checkbox"/> <u>Social Science, Policies &amp; Issues</u>       |
| <input checked="" type="checkbox"/> <u>Education &amp; Teaching</u>        |   |



**Critical Requirements:** Students who follow the 2011-2012 catalog year and are entering ASU as either a first-time freshman or transfer from any Arizona public university or Arizona community college must complete critical requirements.

Course Subject and Title <i>(courses in bold/shading are critical)</i>	Hrs.	Upper Division	Completed ATP: <input type="checkbox"/> Yes <input type="checkbox"/> No		Completed AGEC: <input type="checkbox"/> Yes <input type="checkbox"/> No	
			Transfer Course/Grade	Minimum Grade if Required	Additional Critical Requirement Notes	
<b>TERM ONE: 0-15 CREDIT HOURS</b>						
<b>ASU 101: The ASU Experience</b>	1	<input type="checkbox"/>				<ul style="list-style-type: none"> <li>ASU 101 is for ASU freshman students only Not required of transfer students</li> <li>An SAT, ACT, Accuplacer, or TOEFL score determines placement into first-year composition courses</li> <li>ASU Math Placement Exam score determines placement in Mathematics course</li> <li>Minimum 2.0 GPA in all critical courses</li> <li>BIO 181 &amp; 182 must be completed by end of term 3</li> <li>CHM 113 &amp; 116 must be completed by end of term 3</li> <li>Complete all critical courses by end of term 4</li> <li>Complete all Math requirements by end of term 5</li> </ul>
<b>BIO 181: General Biology I (SQ)</b>	4	<input type="checkbox"/>		Grade of C		
<b>CHM 113: General Chemistry I (SQ)</b>	4	<input type="checkbox"/>		Grade of C		
ENG 101 or 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or 108: English for Foreign Students	3	<input type="checkbox"/>		Grade of C		
MAT 170: Pre Calculus or higher (MA)	3	<input type="checkbox"/>				
<b>TERM TWO: 16-30 CREDIT HOURS</b>						
<b>BIO 182: General Biology II</b>	4	<input type="checkbox"/>		Grade of C	<ul style="list-style-type: none"> <li>Minimum 2.0 GPA in all critical requirements</li> <li>BIO 181 &amp; 182 must be completed by end of term 3</li> <li>CHM 113 &amp; 116 must be completed by end of term 3</li> <li>Complete all critical requirement courses by end of semester 4</li> <li>Complete all Math requirements by end of semester 5</li> </ul>	
<b>CHM 116: General Chemistry II</b>	4	<input type="checkbox"/>		Grade of C		
ENG 101 or 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or 108: English for Foreign Students	3	<input type="checkbox"/>		Grade of C		
SPE 222: Orientation to the Exceptional Learner (SB) and (C)	3	<input type="checkbox"/>				
<b>TERM THREE: 31-45 CREDIT HOURS</b>						
<b>CHM 231/235: Elementary Organic Chemistry/Laboratory</b>	3/1	<input type="checkbox"/>		Grade of C	<ul style="list-style-type: none"> <li>Minimum 2.0 GPA in all critical requirements</li> <li>BIO 181 &amp; 182 must be completed by end of term 3</li> <li>CHM 113 &amp; 116 must be completed by end of term 3</li> <li>Complete all critical requirement courses by end of semester 4</li> <li>Complete First Year Composition by the end of semester 3</li> <li>Complete all Math requirements by end of semester 5</li> </ul>	
PHY 111/113: General Physics/Laboratory Or PHY101	3/1 or 3/1	<input type="checkbox"/>		Grade of C		
EDT 180: Computer Literacy (CS)	3	<input type="checkbox"/>		Grade of C		
Humanities, Fine Arts & Design (HU) and (G)	3	<input type="checkbox"/>				
BLE 220: Foundations of SEI	3	<input type="checkbox"/>				
<b>TERM FOUR: 46-60 CREDIT HOURS</b>						
<b>LSC 347: Fundamentals of Genetics</b>	3	<input checked="" type="checkbox"/>		Grade of C	<ul style="list-style-type: none"> <li>Minimum 2.0 GPA in all critical requirements</li> <li>Complete all critical requirement courses by end of semester 4</li> <li>Complete all Math requirements by end of semester 5</li> </ul>	
PHY 112/114: General Physics/Laboratory, if one year sequence of physics desired (pre-professional programs including grad school) or GLG101/103 Introduction to Geology (Physical)	3/1 or 3/1	<input type="checkbox"/>		Grade of C		
Social and Behavioral Sciences (SB)	3	<input type="checkbox"/>		Grade of C		
Humanities, Fine Arts, and Design (HU) and (H) or recommended HST 109: United States to 1865 (HU) and (H)	3	<input type="checkbox"/>				
<b>TERM FIVE: 61-75 CREDIT HOURS</b>						
<b>Complete 1 course from:</b> <b>BIO 353: Cell Biology or</b> <b>BIO 320: Fundamentals of Ecology</b>	3	<input checked="" type="checkbox"/>		Grade of C	<ul style="list-style-type: none"> <li>Minimum 2.0 GPA in all critical requirements</li> <li>Complete all critical requirement courses by end of semester 4</li> </ul>	
BIO/LSC/MIC/PLB Elective or recommended BIO345: Organic Evolution	3	<input checked="" type="checkbox"/>		Grade of C		
Upper Level Social & Behavioral Science (SB) or Humanities or Fine Arts & Design (Hu)	3	<input checked="" type="checkbox"/>				
TEL 315: Human Development (L)	3	<input checked="" type="checkbox"/>				
BIO 480: Methods of Teaching Biology	3	<input checked="" type="checkbox"/>				
SED 396: Field experience	1	<input checked="" type="checkbox"/>		Grade of Y		
<b>TERM SIX: 76-90 CREDIT HOURS</b>						
<b>Complete remaining course from:</b> <b>BIO 353: Cell Biology or</b> <b>BIO 320: Fundamentals of Ecology</b>	3	<input checked="" type="checkbox"/>		Grade of C		
BIO/LSC/MIC/PLB Elective or recommended PLB310: Flora of Arizona	4	<input checked="" type="checkbox"/>		Grade of C		
TEL 311: Instruction Management	3	<input checked="" type="checkbox"/>				
BIO 482: Advanced Methods of Teaching Biology	3	<input checked="" type="checkbox"/>		Grade of C		
RDG 323: Content Area Literacy (L)	3	<input checked="" type="checkbox"/>		Grade of C		
SED 397: Field Experience	1	<input checked="" type="checkbox"/>		Grade of Y		

**Critical Requirements:** Students who follow the 2011-2012 catalog year and are entering ASU as either a first-time freshman or transfer from any Arizona public university or Arizona community college must complete critical requirements.

Course Subject and Title <i>(courses in bold/shading are critical)</i>	Hrs.	Upper Division	Transfer Course/Grade	Minimum Grade if Required	Additional Critical Requirement Notes
<b>TERM SEVEN: 91-105 CREDIT HOURS</b>					
<b>SPE 417: Inclusion Practices for SED</b>	3	<input checked="" type="checkbox"/>			• Language and Cultures: see Additional Notes, below
<b>BLE 407: SEI</b>	3	<input checked="" type="checkbox"/>		Grade of C	
<b>SED 322: Classroom Leadership</b>	3	<input checked="" type="checkbox"/>		Grade of C	
Upper Level Elective <b>WITH</b> Language and Cultures: Cultural (C) or Global Awareness (G)	3	<input checked="" type="checkbox"/>			
BIO/LSC/MJC/PLB Elective or recommended BIO360: Animal Physiology and highly recommended LSC359/BIO361: Animal Physiology lab	3 or 4	<input checked="" type="checkbox"/>		Grade of C	
<b>SED 496: Field Experience</b>	1	<input checked="" type="checkbox"/>		Grade of Y	
<b>TERM EIGHT: 106-120 CREDIT HOURS</b>					
<b>SED 478: Student Teaching</b>	8-12	<input checked="" type="checkbox"/>		Grade of Y	• Language and Cultures: see Additional Notes, below
Upper Level Elective <b>WITH</b> Language and Cultures: Cultural (C) or Global Awareness (G)	3	<input checked="" type="checkbox"/>			

**Graduation Requirements Summary:**

Total Hours (minimum 120)	Total Hrs at ASU (minimum 30)	Hrs Resident Credit for Academic Recognition (minimum 56)	Major GPA (2.000 Min.)	Total UD Hrs (minimum 50)	Total Comm. College Hrs. (64 Max)
120	30	56	2.00	50	64

**General University Requirements: Legend**

- General Studies Core Requirements:
  - Literacy and Critical Inquiry (L)
  - Mathematical Studies (MA)
  - Computer/Statistics/Quantitative applications (CS)
  - Humanities, Fine Arts, and Design (HU)
  - Social and Behavioral Sciences (SB)
  - Natural Science-Quantitative (SQ)
  - Natural Science-General (SG)
- General Studies Awareness Requirements
  - Cultural Diversity in the US (C)
  - Global Awareness (G)
  - Historical Awareness (H)
- First Year Composition

**Additional Notes:**

- MAT170 is required for the major; however most professional programs require MAT210. Please consult with an advisor for the appropriate course choice.

**New College of Interdisciplinary Arts & Sciences Requirements:**

- Mathematics. Unless a specific math course is listed, students must complete MAT 142 or any MAT course for which MAT 117 or higher level MAT course is a pre-requisite. The mathematics requirement must be completed with a grade of "C" or better.
- A minimum of 12 upper-division semester hours in the major must be taken in campus resident credit. No credit is granted toward fulfilling major or minor requirements in any upper-division course in the subject of the major unless the grade in that course is at least a "C".
- Each student in the College is required to demonstrate proficiency in the analysis of language and cultures and mathematics by passing an examination or by completing the courses specified below with a grade of "C" or higher in each course. Students considering graduate work after completion of a bachelor's degree should consult with faculty advisors regarding language requirements in their intended areas of study.
  - Language and Cultures: This requirement may be satisfied through one of the following:
    1. completion of secondary education at a school in which the language of instruction is not English
    2. completion of a language course at the intermediate level (202 or equivalent), including American Sign Language IV
    3. completion of upper division course(s) taught in a foreign language, taken in the United States or the relevant country;
    4. completion of six semester hours of upper-division courses that have a Global Awareness (G) or Cultural Diversity (C) designation, in addition to the courses used to meet the University General Studies requirements or four (4) sequential semesters of one foreign language or two (2) semesters of a current computer language. Adjustment to upper division hours is required if lower division courses are used.
    5. completion of two sequential semesters of coursework in a current computer language



April 25, 2011

TO: Curriculum and Academic Program Committee  
FROM: Mari Koerner, Dean, Mary Lou Fulton Teachers College  
RE: BS in math and natural sciences with a concentration in secondary education

This memo confirms the support of Mary Lou Fulton Teachers College for the BA in life sciences with a secondary education concentration to be offered by the Division of Mathematical and Natural Sciences within the New College of Interdisciplinary Arts and Sciences. I find this proposal in keeping with the need to increase the number and quality of secondary math and science teachers. Of importance, its program also coincides with the College expectations for a secondary education concentration. This proposal comes with the support of the Liaison Committee that the College convenes to strengthen the communication and collaboration between Mary Lou Fulton Teachers College and the various discipline areas at ASU.

As the above comments indicate, I recommend this proposal without reservation. It takes an important step toward offering multiple paths for teacher candidates to teach in secondary schools: (1) obtaining a concentration in secondary education while completing a major in a discipline or (2) obtaining a degree in secondary education with a specialization within a discipline.



April 26, 2011

To: Curriculum Review Committees and Administrators

From: Roger L. Berger, Director  
Division of Mathematical and Natural Sciences

*Roger L. Berger*

Re: Proposal for BA in Life Sciences (Secondary Education)

The faculty of the Division of Mathematical and Natural Sciences have reviewed and approved this proposed concentration in Secondary Education for our BA in Life Sciences degree. This concentration fulfills all the requirements for our BA in Life Sciences degree.

The required courses for this new concentration that are taught by our Division are existing courses that we already teach. This concentration will require no new classes or other resources. Our current advising staff can accommodate the expected new enrollments from this concentration.

Roger L. Berger, Director  
Division of Mathematical and Natural Sciences  
New College of Interdisciplinary Arts and Sciences  
Mailing address: P O Box 37100, Mail code 2352, Phoenix, AZ 85069-7100  
Shipping address: 4701 W Thunderbird Road, Glendale, AZ 85306-4908  
602-543-8545 Fax: 602-543-6073