

CALIFORNIA STATE UNIVERSITY, BAKERSFIELD
ACADEMIC SENATE

Conversion of BA in Natural Sciences
RES 1314054

AAC/BPC

RESOLVED: that the Academic Senate recommend that the President approve the conversion of the current BA in Natural Sciences to a BS in Natural Sciences.

RATIONALE: Both the Academic Affairs and the Budget and Planning Committees have reviewed and approved the proposal to convert from a BA to a BS in Natural Sciences.

Distribution List: President, Provost, AVP Academic Programs

Approved by the Academic Senate on April 10, 2014
Sent to the President for approval on April 18, 2014
Approved by the President on May 19, 2014



CSU Bakersfield

School of Natural Sciences, Mathematics, and Engineering

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February 3, 2014

From: NSME Curriculum Committee
Re: BA to BS request for Natural Sciences

Natural Sciences has submitted a request to change the BA in Natural Sciences to a BS in Natural Sciences. This matter was discussed by the NSME Curriculum Committee at its meeting on Friday, January 31, 2014. The committee approved the change.

Sincerely,

A handwritten signature in blue ink, appearing to read "Melissa Danforth".

Dr. Melissa Danforth
Associate Professor
NSME Curriculum Committee Chair for 2013/14



CSU Bakersfield

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Memorandum

DATE: February 10, 2014

TO: Jacquelyn Kegley, Chair, Academic Senate
c: Horace Mitchell, President
Carl Kemnitz, Associate Vice President, Academic Programs
Anne Houtman, Dean, School of Natural Sciences, Mathematics, and Engineering
Melissa Danforth, Chair, NSME Curriculum Committee
Carl Kloock, Program Coordinator

FROM: Soraya M. Coley, Provost and Vice President for Academic Affairs 

RE: Natural Sciences BA to BS Conversion Proposal

Please find attached the Natural Sciences BA to BS Conversion Proposal for review and consideration by the Academic Senate. This request has been approved by the Program Coordinator, the School Dean, and the School of Natural Sciences, Mathematics and Engineering Curriculum Committee. I also support this request and appreciate the Academic Senate's consideration. Please feel free to contact Dr. Carl Kloock or Dean Anne Houtman for questions or clarification.

Proposal to convert the BA in Natural Sciences to a BS in Natural Sciences.

1. **Approval.** The proposed changes were approved by the Natural Sciences Advisory Committee on ___1/15/2014_____. Please see attached memo.
2. **Proposed Changes.** To convert the existing BA in Natural Sciences into a BS in Natural Sciences.
3. **Resource Implications.** None.
4. **Curriculum Implications.** None.
5. **Rationale.**
 - a. BS programs currently have a minimum upper division unit requirement of 27 units in the major¹, while BA programs have a minimum requirement of 60 upper division (quarter-basis) units total (including major, GE etc). The 60 unit upper division requirement causes problems because of the extensive lower division requirements (current total =70-73 units) of this program. Currently, if students satisfy certain requirements (e.g. Geology, GRE) with lower division coursework rather than upper division coursework, they may satisfy all other degree requirements with less than 60 upper division units, requiring them to take additional coursework – not necessarily related to the major – and thus exceed 180 units to earn their degree.
 - b. The degree better follows the campus policy² for and BS degrees than for BA degrees. According to this policy, the minimum major for a BA is 36 Units, while the minimum major for the BS is 55 units. Including the core and concentration, major requirements for the Natural Science degree total at least 99 units in the major, clearly meeting the bar for a BS program.
 - c. The program cannot survive the transition to Semesters and maintain its current rigor without conversion to a BS. The changes in the lower division core coursework as currently proposed by the individual departments will likely consume a larger percentage of Semester units: for example, several departments are proposing replacing their current 15 quarter unit sequences (10 semester units) with 12 semester unit sequences. This will exacerbate the upper division problem.
 - d. Conversion to a BS allows us to simplify the program structure in several small ways by eliminating special caveats and exemptions recently enacted to help students reach 60 upper division units without exceeding 180 units.
 - e. Conversion to a BS will allow the program to more readily adapt to potential changes in state policy resulting from the recent adoption (Sept 2013) of the Next Generation Science Standards (<http://www.nextgenscience.org/next-generation-science-standards>).
 - f. Additionally, there are occasionally concerns expressed by both incoming students and school administrators that the degree is "only" a BA and thus not appropriate preparation for science teachers. Converting to a BS would eliminate this potential perceptual hurdle to recruiting of students and employment of graduates.
6. **Request for Approval New Course/Course Changes.** None.
7. **Catalog copy.** See attached catalog copy for proposed changes. In addition, please see attached Chancellor's office policy on changing degree designations.

Follows the NS&M Curriculum Committee GUIDELINES FOR SUBMISSIONS adopted April 10, 2009, Revised Spring 2009. <http://www.csub.edu/nsme/docs/curriculum/GuidelinesforSubmission041009.pdf>

¹ Title 5 CA ADC § 40501 § 40501. Bachelor of Science Degree: Required Curriculum.

² 2013-2015 CSU Bakersfield Catalog, p49.

CATALOG COPY

Natural Sciences

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The Departments of Biology, Chemistry, Geology, and Physics offer a Bachelor of ~~Arts~~Science in Natural Sciences. This degree program offers the required subject matter content to help prepare prospective science teachers to apply for subject matter certification in California by taking the California Subject Matter Examinations for Teachers (CSET) in Science.

The four disciplinary concentrations within the BABS in Natural Sciences prepare the candidate for the CSET Science exams, which consist of three exams: two covering breadth in science (Life Science, Chemistry, Earth and Planetary Science, and Physics), and one covering depth in one of these areas, corresponding to the concentration. Passage of the CSET in science is required to certify subject matter competency before entering a teacher credential program ~~for prospective teachers~~. Consult your advisor or the Department of Education for details on other entry requirements for pursuing a secondary teaching credential.

The foundational science concentration prepares students for the foundational science CSET exams (two exams covering science breadth, as above) and includes credential coursework, providing science subject matter and the credential in a blended program.

The core courses in the BABS in Natural Sciences offer a broad foundation in all four of the natural science areas (Biology, Chemistry, Geology, and Physics) and Mathematics. The disciplinary concentrations and minors add depth preparation in two of the four areas, while the foundational science concentration adds credential coursework to this foundation. While this broad foundation has been developed for prospective teachers, it also serves as excellent preparation for employment in any area of business, industry or government where scientific skills are in demand.

Please be aware that several courses in the core require satisfactory scores on placement tests or completion of prerequisite courses. Chemistry 211 requires a satisfactory score on the chemistry placement exam OR completion of Chemistry 101; Math 192 requires a satisfactory score on the pre-calculus readiness exam OR completion of Math 190 or 191 – In addition, Math 190 or 191 ~~may~~ requires satisfactory ELM scores or completion of previous remedial mathematics coursework.

The disciplinary concentrations in the BABS in Natural Sciences consist of three components: I. Core Coursework, which all students complete, includes all four sciences and mathematics. II. A Concentration consisting of 6-7 additional upper division courses within a specific science discipline (Biology, Chemistry, Geology or Physics), and III. A minor in a second science discipline, Mathematics, or Statistics. For students with science minors, 2 courses (ten units) from the core, in the same discipline as the minor, will be counted towards the minor ~~instead of the core~~. They are listed with the core rather than with the minors for convenience of presentation.

Students in the disciplinary concentrations ~~other than physics~~ are advised to satisfy the Gender-Race-Ethnicity requirement with EDTE 416 ~~or another upper division course (i.e. 300 or higher). HIST 231 or HIST 232 satisfies both the US history requirement and the C3 General education area.~~ For students in the Physics concentration, the required courses PHYS 221, PHYS 222 and ENGR 207 satisfy the A3 General Education requirement, ~~and a five unit upper division course is recommended to satisfy GRE requirements. If a 3-unit GRE course is selected students may need additional upper division coursework to satisfy the university requirement of 60 upper division units.~~

Requirements for the Bachelor of ArtsScience Degree in Natural Sciences: Disciplinary concentrations

Total Units Required to Graduate	180 units
Major Requirements	89-103<u>99-103</u> units
Core Courses	55-68 <u>70-73</u>
Concentration	29-30
Minor Requirement	<u>10-20</u> units
Other University Requirements	55-62<u>60-72</u>units
CSUB 101	2
American Institutions	5
Area A	10-15
Area B	0*
Area C	15
Area D	15
Theme I	0*
Theme 2	5
Theme 3	5
GRE	3-5
GWAR (Test) or Class	0-5

*satisfied in major, minor or other university requirements

Additional Units **~~0-11~~ units**

~~Students are strongly encouraged to monitor their upper division units to ensure achieving the 60 upper division units required for graduation. See <http://www.esub.edu/schedules.shtml> for current list of courses satisfying university wide requirements.~~

One (1) quarter unit of credit normally represents one hour of in-class work and 2-3 hours of outside study per week

BABS in Natural Sciences Disciplinary concentrations

I. Core Coursework (60-73 Units) Note: For science minors, 2 courses (10 units) from the core, in the same discipline as the minor will be counted toward the minor instead of the core.

Life Science (15 units)

BIOL 201, 202, and 203

Chemistry (15 Units)

CHEM 211, 212, and 213

Earth and Planetary Science (15 Units)

GEOL 201, 204 and one of PHYS 110 (Astronomy) or GEOL 205 or 308

Math (10 Units)

Physics Concentration: MATH 192 and one of MATH 201 or 231

Biology, Chemistry and Geology Concentrations:

MATH 191 and 211 or MATH 192 and one of MATH 201 or 231

Foundational Concentration:

MATH 191 and 140 or 211 or MATH 192 and one of MATH 201 or 231

Physics¹ (15-18 Units)

One physics sequence: either PHYS 201, 202 and 203 or PHYS 221, 222 and 223

~~For students in the disciplinary concentrations, one course from the core, outside of the concentration and minor, can be waived.~~

II. Concentration -- Select one

Biology Concentration: (29-30 Units)

BIOL 301 304, 305, 306, 470, and 490

One of BIOL 318 or 357

Chemistry Concentration: (30 units)

CHEM 331, 332, 340, 390, and 490

One of CHEM 421 or 422 and one upper division Chemistry Elective (Must be a 5-unit lab course)

Geology Concentration: (30 Units)

GEOL 303, 306, 307, 309, 475, and 490

Physics Concentration¹: (30 units)

PHYS 207, 307, 324, 325, and 490

Four or more units of upper division PHYS electives **OR** four or more units from CHEM 361, 362, 363

III. . Minor. Select one, different than Concentration

Biology Minor (10 Units).

10 Upper division units in Biology. Recommended courses: BIOL 304, 305 306, or 470

Chemistry Minor (10 Units)

10 Upper division units in Chemistry. Recommended courses: CHEM 331, 350

Geology Minor: (10 Units)

10 Upper division units in Geology. Recommended courses: GEOL 303, 306, 307, 309 or 475

Math Minor¹ (20 Units)

20 Units in Mathematics, 10 of which must be upper division. Recommended courses: MATH 202 or 212 or 232, MATH 203 or 233 and 10 units of Upper division Mathematics. Recommended for Physics concentration: Math 302 and 304

Physics Minor¹ (10 Units)

10 Upper division units in Physics. Recommended courses: MATH 202 or 212 or 232, Math 203, or 233, PHYS 324 and 5 or more units of upper division physics. .

Statistics minor (20 Units)

MATH 140, 338, 339, and 415

¹Students in the Physics Concentration and minor must complete the PHYS 221, 222 & 223 sequence. MATH 203 is required for most upper division physics courses. The Math Minor is strongly encouraged for students within the physics concentration. ~~Students with this combination are also advised to take GEOL 308 in the core.~~

The Foundational science concentration in the BABS in Natural Sciences has been developed for individuals seeking the Foundational Science Credential for Middle School and Junior High School science teachers. The Foundational science concentration requires the same core coursework as the disciplinary concentrations, but the concentration and minor in science are replaced by teaching credential coursework. The Foundational science concentration prepares the candidate for the CSET exams in Foundational Science, which consist of 2 exams covering breadth in science (Life Science, Chemistry, Earth and Planetary Science and Physics). This allows students to earn the foundational science credential in a blended, 4-year program including both science and credential coursework. Please be advised that the foundational science credential is intended for teaching grades 6-8.

Additional appropriate post-baccalaureate coursework and CSET exams can be taken to add an authorization for High School level single subject certification.

The CSET exams must be passed before beginning Credential coursework, with the exception of prerequisite and foundational courses (EDSE/EDTE 300, 410 and 416, EDSP 301) which should be taken during the junior year. Other credential coursework should not be started until the senior year in most cases. Please consult an advisor for help with CSET planning.

Requirements for the Bachelor of ArtsScience Degree in Natural Sciences: Foundational Science concentration

Major Requirements		124-127 units
Core Courses	70-73	
Concentration	51	
Senior Seminar	3	
Minor Requirement		0 units
Other University Requirements	60-67 units	
CSUB 101	2	
American Institutions	5	
Area A	15	
Area B	0*	
Area C	10	
Area D	15	
Theme I	0*	
Theme 2	5	
Theme 3	5	
GRE	3-5	
GWAR (Test) or Class	0-5	

*satisfied in major, minor or other university requirements

Additional Units **0 units**

Total Units Required to Graduate **189-197 units**

See <http://www.csub.edu/schedules.shtml> for current list of courses satisfying university-wide requirements.

One (1) quarter unit of credit normally represents one hour of in-class work and 2-3 hours of outside study per week

BABS in Natural Sciences: Foundational science concentration

- I. Core Coursework: see I above (70-73 Units)
- II. Concentration : (51 units): EDSE 531, 532, 533, 534, 535 & 599. EDSE/EDTE 300, 410, 415 & 416. EDSP 301. EDTE 401, 402, 403 & 404.
- III. Senior Seminar: Science 490

Course description:

SCI 490 (3)

Senior Seminar in Science teaching. Student presentations and discussions of science content, lessons and lab activities relevant to the middle school science audience. Open only to individuals pursuing the foundational science concentration in the BABS in Natural Sciences. 3 hours discussion. Prerequisite: Senior Standing.