REQUEST FOR A NEW MAJOR
University of Central Oklahoma

Please note: All information contained in this form will be reviewed by persons outside of your college. Please use clear and concise language when completing this form.

Proposed Name of Major (limited to 30 spaces*)
*Remember when abbreviating names, this is how they will appear on student’s transcripts.
Environmental Chemistry

Name of Major: (full name of major if longer than 30 characters)
Chemistry - Environmental Chemistry

To which program is this new major connected:
Chemistry

Degree Designation (ex. B.S., M.A.)
B.S.

CIP Code: 40.0509 For information regarding CIP codes contact your department chair or visit: http://www.uco.edu/academic-affairs/ir/program_inventory.asp.

Does this new major affect other programs or departments?
X Yes  No If yes, provide name(s) of department chair(s) contacted, date(s), and results of discussion(s).

The following have been contacted via email on March 2, 2020. There have been no objections to date. Biology: Bob Brennan, Engineering & Physics: Chuck Hughes, Math & Statistics: Jesse Byrne, Political Science: Kenneth Kickham, History & Geography: Katrina Lacher, Forensic Science Institute: Dwight Adams (on 3/3/2020)

Date submitted to Provost Cabinet: 05/01/2020

All proposals for new programs and majors must be presented by the College Dean to the Provost Cabinet for prioritization, planning and approval to proceed.

Chemistry

Department submitting the proposal

Eric Eitheim eeitheim@uco.edu 5519
Person to contact with questions email address Ext. number

Approved by:


Department Chair College Curriculum Committee Chair
09/04/2020 09/04/2020
Date Date
(Please notify department chair when proposal is forwarded to dean.)

College Dean Academic Affairs Curriculum or Graduate Council
9/24/2020 09/04/2020
Date Date
(Please notify department chair when proposal is forwarded to AA.)

Office of Academic Affairs Effective term for this program change
Date
(Assigned by Academic Affairs)
1. What is the objective of this new major? (This is a question from the OSRHE request for new major form)
   To meet student and state demand for environmental specific chemistry training.

2. Proposed curriculum as it will appear in the catalog: (Please place asterisk(s) beside new courses and submit a "Request for a New Course" form for each new course.)

   **Proposed Major Requirements**

   **Support Courses**
   - 0-6

   **Required Courses:**
   - MATH 1453 Applied Algebra OR
   - MATH 1533 Precalculus-Algebra OR
   - MATH 1513 College Algebra OR Placement Score AND
   - MATH 1593 Plane Trigonometry OR Placement Score

   **Chemistry – Environmental Chemistry**
   - 77

   **Common Core**
   - 53

   **Required courses:**
   - CHEM 1303 General Chemistry I
   - CHEM 1112 General Chemistry I - Recitation/Lab
   - CHEM 1223 General Chemistry II
   - CHEM 1232 General Chemistry II - Recitation/Lab
   - CHEM 2104 Quantitative Analysis and Lab
   - CHEM 2621 Professionalism in Chemistry I
   - CHEM 3303 Organic Chemistry I
   - CHEM 3312 Organic Chemistry I Lab
   - CHEM 3323 Organic Chemistry II
   - CHEM 3332 Organic Chemistry II Lab
   - CHEM 3454 Fundamentals of Instrumental Analysis and Lab
   - CHEM 3621 Professionalism in Chemistry II
   - BIO 1204 Biology for Majors: Principles
   - BIO 1225 Biology for Majors: Diversity
   - MATH 2153 Bio-Calculus
   - PHY 1114 General Physics I and Lab
   - PHY 1214 General Physics II and Lab
   - STAT 2103 Intro Statistics for Sciences

   **Advanced Course Work**
   - 24

   **Required courses:**
   - *CHEM 3xx3 Environmental Chemistry
   - CHEM 3203 Introductory Physical Chemistry
   - CHEM 3403 Biochemistry I
   - CHEM 4454 Environmental Chemical Analysis and Lab
   - CHEM 4892 Capstone for Chemistry

   **Chemistry Electives (3000/4000 level)**
   - 3

   **Additional Electives**
   - 6

   **BIO 3543 General Ecology
   - GEO 3253 Intro to Environ Biogeography
   - GEO 3703 Environmental Conservation
   - GEO 4113 Geographic Information Systems
   - GEO 4743 Advanced GIS: Environmental
   - HIST 3723 American Environmental History
   - HIST 3743 Global Environmental History
   - POL 4423 Environmental Politics
   - Other electives as approved by the department

   **Electives to bring total to**
   - 124

   **The following are highly recommended:**
   - CHEM 4654 Inorganic Chemistry and Lab
   - ENG 4023 Technical Writing

   **Minimum Grade Requirements**
   1. Average in (a) all college course work, and (b) course work at UCO 2.25
   2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.
NOTE: The Oklahoma State Regents require all majors under a program share approximately 50 percent of the major course requirements.

3. Have you checked to ensure there are no hidden requirements with each of the proposed courses in the curriculum?
   X Yes  No

4. Demand for this new major. What is the local, regional, and/or national need for this program? Provide market analysis data or other tangible evidence to support employment opportunities available for graduates of this major using state and national market surveys, employment projections, trend analysis, etc.
   The proposal of this major is in response to the Governor's "2018-2020 Critical Occupations in Oklahoma" which lists a number of professions that could reasonably be pursued by a student who completes this major. Besides healthcare professions, the other professions that related to chemistry involved environmental studies, including the following listed by SOC code, names, 2018-2020 change, annual openings, and median hourly wage.

   19-2041 Environmental Scientists and Specialists, Including Health, +76, 56 openings, $27.08/hr
   19-4031 Chemical Technicians, +38, 58 openings, $22.07/hr
   19-4041 Geological and Petroleum Technicians, +104, 148 annual openings, $25.92/hr
   19-4091 Environmental Science and Protection Technicians, Including Health, +31, 48 annual openings. $14.41/hr

   SOC code, names, 2018-2028 change, annual openings, and median hourly wage

5. Projected number of students expected to select this major over the first three years.

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<thead>
<tr>
<th>Semester</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
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<tbody>
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<td>Spring</td>
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<td>Summer</td>
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6. Projected new cost of the major over the first three years based on the projected number of students expected to select this major for:

   a. Faculty or staff (new or re-allocated faculty/staff and specify whether full-time or part-time)
      2021 | No new costs (Environmental Chemistry is scheduled to be taught already)
      2022 | 3 c.h. to teach CHEM 3XX3: Environmental Chemistry. Reallocated time. $2745 PhD Adjunct
      2023 | No new costs (Environmental Chemistry is scheduled to be taught already)

   b. Resources, technology, supplies or equipment that must be acquired for this new major:
      List items which must be purchased and estimated cost. (Be specific.)
      2021 | No new costs
      2022 | No new costs
      2023 | No new costs

7. Does the UCO Library have the required library resources available for this new major?
   X Yes  No  If yes, provide names of Librarian/Faculty Liaisons contacted, dates, and results of discussion. A phone call and email correspondence with Brian Buckley on 2/25/2020 confirmed there are sufficient books and journal subscriptions needed for both Environmental Chemistry and Advanced Environmental Chemistry Laboratory.
If no, what additional library resources must be acquired for this new major? List items which must be purchased and estimated cost. (Be specific, e.g., books, magazines, journals, etc.)

Nothing beyond what has already been purchased following the 2/25/2020 correspondence with Brian Buckley. The purchase included two environmental chemistry books totaling no more than $300.

8. Will the majority of this major be available via electronic media? (If so, explain: online, SPOC, etc.)
   Yes  X  No  explain

9. Unnecessary duplication: How does the proposed major complement and strengthen existing programs at UCO? List similar majors, if any, and discuss the degree of similarity.
   Chemistry – Health Sciences is the closest related major that focuses on chemistry most applicable to healthcare professions. We have found that many students who major in Chemistry – Health Sciences are doing so with the intent of working in an environmental-chemistry-related field, since this is currently the closest major offered at UCO to their career path. We believe that students would benefit from the option of another major that gives students who are not pre-healthcare more environmentally-specific education and training. The similarities are in the lower-level courses that are necessary foundation-level knowledge of chemistry and other related STEM disciplines.

10. The purpose and need for this new major is based on which of the following: (Check all that apply; explain and document in Question #11)
   ___ Specialized Accreditation
   ___ SSCI (Self Study for Continuous Improvement)
   ___ Benchmark (e.g. comparison to peer institutions)
   ___ Assessment Data
   ___ Faculty Knowledge/Discipline Expertise
   ___ Advisory Board/Outside Professional Group
   ___ Other

11. For all items checked in Question #10, please provide a concise, yet comprehensive, statement that explains the purpose and need for requesting the new major including any necessary documentation. (The information provided here will be submitted to the OSRHE)
   Governor Stitt’s “2018–2020 Critical occupations in Oklahoma” list identifies a number of professions that align with the learning outcomes for a major in Environmental Chemistry. Most relevant to this major is Environmental Scientists and Specialists, Including Health. The list indicates there were 476 positions with this title available in 2018, and anticipates 570 positions in this field in 2028. The list also indicates 56 of these positions open annually. This major will be suitable for students interested in occupations requiring a bachelor's degree, but with hands-on experience with modern chemical instrumentation. Many of our recent majors have sought positions within Oklahoma that require experience with chemical instrumentation. This major will support UCO's mission and the Transformative Learning and Place pillars through incorporation of student projects involving application of content to real world environmental issues in the community, based on the Project SCHOLAR model from Statistics.
12. State Regents Math Initiative Questions: (For undergraduate degree programs only)

As part of the broader work of the Mathematics Success Initiative, the Math Pathways Task Force has identified four gateway mathematics courses that are suitable general education mathematics course options. These courses, *College Algebra/Pre-Calculus, Introduction to Statistics, Functions and Modeling, and Quantitative Reasoning*, are included on the Course Equivalency Project transfer matrix and provide rigorous mathematical content that is more relevant and appropriate for specific academic majors.

Please respond to the following questions:

1. Which mathematics course is required as part of the general education requirements? If the program allows for multiple gateway mathematics course options, provide a rationale for each.

   MATH 1453 Applied Algebra

   Students who have had MATH 1513 College Algebra will also satisfy the prerequisites for subsequent courses, however, MATH 1453 is the preferred path.

2. Describe how the mathematics course was selected and how it best meets the needs of the program’s students.

   As part of OSRHE’s Math Pathways initiative, the Department of Mathematics and Statistics designed MATH 1453 specifically for those majors that require a solid foundation in Algebra, but do not proceed on to Calculus I. It is tailored to serve as a prerequisite for required courses, MATH 2153 Bio-Calculus and CHEM 1103 General Chemistry I.

3. How does this mathematics course articulate with your partner institutions?

   The majority of state institutions have recently developed or are in the process of developing a Functions and Modeling pathway. MATH 1453 will occupy this role at UCO. Along with these other institutions, the Department of Mathematics and Statistics plans to submit a syllabus for inclusion on the matrix as soon as possible. In the meantime, students that wish to transfer in a Functions and Modeling course from an Oklahoma institution will receive credit for MATH 1453.