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| University Mission | | | | | | | |
| | | Our principal mission at Lake Superior State University is to help students develop their full potential. We do this by providing high-quality, academically rigorous programs in an engaged, personal and supportive environment. This combination nurtures potential and sets students on paths to rewarding careers and productive, satisfying lives. We also serve the regional, national and global communities by contributing to the growth, dissemination and application of knowledge. | | | | | |
| College Mission Statement | | The mission of the College of Natural, Mathematical and Health Sciences is to help students develop their potential as professionals in their respective fields. The College provides rigorous academic programs in an engaged, personal and supportive environment. Faculty members enhance student success and the future of the College through their teaching, scholarship and professional development; and act as role models in life-long learning and community service. We prepare graduates for advanced study and/or careers in disciplines crucial to the progress of our nation in the 21st Century. In addition to the major programs, the College provides courses for all University students that serve the national need for literacy in science, mathematics, and health; and provide students with opportunities to demonstrate growth and achievement in their selected scientific discipline | | | | | |
| | College GOALS: | 1. Develop skills in analysis, critical thinking, problem solving, decision-making, and communication. | 2. Prepare students for careers using their respective degrees and/or certificates. | 3. Prepare students for graduate schools and professional schools. | 4. Provide hands-on experiences with modern instruments and equipment. | 5. Provide highly skilled professors who are also respected scholars. | 6. Provide unique learning opportunities. |
| School of Physical Science Mission/Vision: | | The School prepares physical and environmental scientists to address regional, state, national and global problems. This is accomplished as we: provide students with a sound foundation in the fundamentals of their selected scientific discipline; provide students with up-to-date research knowledge in their scientific discipline; and provide students with opportunities to demonstrate growth and achievement in their selected scientific discipline. | | | | | |

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| | The School of Physical Sciences Objectives <i>School objectives and assessment data sets were discussed and approved in October 2009</i> | To offer well-planned and pedagogically sound learning exercises in courses and in research projects. | To offer coursework and training appropriate for employment related to departmental majors or minors. | To offer coursework and active learning experiences appropriate to the prerequisites of specified post-baccalaureate programs. | To provide coursework and research opportunities that include opportunities to use equipment. | To recruit Ph.D.-prepared faculty, reward good teaching, encourage faculty to conduct funded research and publish results, and encourage participation in professional organizations. | To utilize the unique environmental features of our region, state, continent and world; the facilities of the Crawford Hall of Science, including the Long Planetarium, the Geographic Information Systems lab and the Environmental Analysis Laboratory; and the LSSU Aquatic Resource Laboratory. |
| Assessment Category | | Academic Experiences | Program Outcomes | Program Outcomes | Academic Experiences | Program Resources | Program Resources |
| Assessment Data Sets from Assessment Plan | | Course syllabi, course assessment documents, compiled Student Research/Projects Experience evaluations, MTTC pass rate data | Course assessments, Student Exit Survey | Student Exit Survey | Compiled Instrument Usage logs and Annual Instrumentation Report | annual faculty HLC report form | Faculty survey data regarding use of unique learning opportunities |
| Program-- Associate Degree: Chemistry | | | | | | | |
| Upon completion of this program a student will be able to demonstrate . . . | | | | | | The University Supports..... | |

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| | Program Outcomes | 1. Factual and theoretical knowledge of chemistry 2. Lab knowledge and skills 3. Competence in the use of chemical instruments and computers 4. Communication skills 5. Information retrieval skills 6. safe chemical practices | Readiness for entry-level employment as a chemical technician | Readiness for advanced coursework in chemistry | An operational knowledge of basic chemical instrumentation as used in chemical analysis | An active and engaged faculty in chemistry | Resources for the maintenance and support of the chemistry program |
| Program-- Associate Applied Science: Chemical Technology | | | | | | | |
| Upon completion of this program a student will be able to demonstrate . . . | | | | | | The University Supports..... | |
| | Program Outcomes | 1. Factual and theoretical knowledge of chemistry 2. Lab knowledge and skills 3. Competence in the use of instruments and computers 4. Communication skills 5. Information retrieval skills 6. safe chemical practices | Readiness for entry-level employment as a chemical technician | Readiness for advanced coursework in chemistry | An operational knowledge of basic chemical instrumentation as used in chemical analysis | An active and engaged faculty in chemistry and technology | Resources for the maintenance and support of the program including the science labs of Crawford Hall |
| Program-- Bachelor of Arts: Chemistry | | | | | | | |
| Upon completion of this program a student will be able to demonstrate . . . | | | | | | The University Supports..... | |
| | Program Outcomes | 1. Factual and theoretical knowledge of chemistry 2. Lab knowledge and skills 3. Competence in the use of chemical instruments and computers 4. Communication skills 5. Information retrieval skills 6. safe chemical practices | Readiness for employment as a chemist, science technician, or chemical technician at the baccalaureate level | Readiness for graduate study in chemistry, biochemistry or chemistry related fields | Experience and familiarity with full range of chemical instrumentation for analysis and research | An active and engaged faculty in all branches of chemistry | Resources for the maintenance and support of the program including the science labs of Crawford Hall |
| Program-- Bachelor of Arts: Preprofessional Chemistry | | | | | | | |
| Upon completion of this program a student will be able to demonstrate . . . | | | | | | The University Supports..... | |

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| | Program Outcomes | 1. Factual and theoretical knowledge of biology, chemistry, physics, and mathematics 2. Lab knowledge and skills 3. Competence in the use of chemical instruments 4. Communication skills 5. Information retrieval skills 6. safe chemical practices | Readiness for employment as a chemist, science technician, or chemical technician at the baccalaureate level | Readiness for post-baccalaureate study in professional fields of pharmacy, veterinary medicine, and medical school | Experience and familiarity with full range of chemical instrumentation for analysis and research | An active and engaged faculty in all branches of chemistry | Resources for the maintenance and support of the program including the science labs of Crawford Hall |
| Program-- Bachelor of Science: Applied Geographic Information Systems | | | | | | | |
| | | Upon completion of this program a student will be able to demonstrate . . . | | | | The University Supports..... | |
| | Program Outcomes | 1. Factual and theoretical knowledge of geographic information systems 2. Software knowledge and skills 3. Competence in the use of geographic information analysis tools 4. Communication skills 5. Information management skills | Readiness for employment as a GIS specialist at the baccalaureate level | Readiness for post-baccalaureate study in geographic information systems | Experience and familiarity with GIS database management, GIS data collection, processing and analysis | An active and engaged faculty current in the developments and advances in GIS | Resources for the maintenance and support of the program including the GIS laboratory and software |
| Program-- Bachelor of Science: Chemistry | | | | | | | |
| | | Upon completion of this program a student will be able to demonstrate . . . | | | | The University Supports..... | |
| | Program Outcomes | 1. Factual and theoretical knowledge of chemistry 2. Lab knowledge and skills 3. Competence in the use of chemical instruments and computers 4. Communication skills 5. Information retrieval skills 6. safe chemical practices | Readiness for employment as a chemist, science technician, or chemical technician at the baccalaureate level | Readiness for graduate study in chemistry, biochemistry or chemistry related fields | Experience and familiarity with full range of chemical instrumentation for analysis and research | An active and engaged faculty in chemistry | Resources for the maintenance and support of the program including the science labs of Crawford Hall |
| Program-- Bachelor of Science: Chemistry Education | | | | | | | |
| | | Upon completion of this program a student will be able to demonstrate . . . | | | | The University Supports..... | |

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| | Program Outcomes | 1. Factual and theoretical knowledge of chemistry and educational pedagogy in science 2. Lab knowledge and skills 3. Competence in the use of chemical instruments and computers 4. Communication skills including effective instructional practices for class and laboratory activities 5. Information retrieval skills 6. safe chemical practices 7. A passing score on the Michigan Test for Teacher Certification for this subject-area | Readiness for employment as a chemistry teacher in classrooms at grade levels 6-12 | Readiness for graduate study in chemistry, biochemistry or chemistry related fields, especially advanced study in science education | Experience and familiarity with full range of chemical instrumentation for education, analysis and research | An active and engaged faculty in chemistry, including chemical educators | Resources for the maintenance and support of the program including the science labs of Crawford Hall |
| Program-- Bachelor of Science: Environmental Chemistry | | | | | | | |
| | | Upon completion of this program a student will be able to demonstrate . . . | | | | The University Supports..... | |
| | Program Outcomes | 1. Factual and theoretical knowledge of chemistry, biology, and environmental science 2. Lab knowledge and skills 3. Competence in the use of chemical instruments and computers 4. Communication skills including effective instructional practices for class and laboratory activities 5. Information retrieval skills 6. safe chemical practices | Readiness for employment in business or industry as an environmental chemist, environmental scientist, science researcher or science technician. | Readiness for graduate study in chemistry, environmental toxicology, biochemistry or other chemistry related fields. | Experience and familiarity with full range of chemical instrumentation for environmental and chemical analysis and for environmental research | An active and engaged faculty in chemistry and applied environmental applications of chemistry | Resources for the maintenance and support of the program including the science labs of Crawford Hall |
| Program-- Bachelor of Science: Environmental Health | | | | | | | |
| | | Upon completion of this program a student will be able to demonstrate . . . | | | | The University Supports..... | |

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| | Program Outcomes | 1. Factual and theoretical knowledge of chemistry, biology, geology, environmental science, public health and epidemiology. 2. Lab knowledge and skills related to assessment of public health 3. Competence in the use of scientific tools of analysis and computers 4. Communication skills including 5. Information retrieval skills | Readiness for employment in business or industry as a public health officer, registered sanitarian or environmental scientist | Readiness for graduate study in environmental health environmental toxicology, biochemistry or other chemistry related fields. | Experience and familiarity with full range of chemical instrumentation for environmental and chemical analysis and for environmental research | An active and engaged faculty in chemistry and applied environmental applications of chemistry | Resources for the maintenance and support of the program including the science labs of Crawford Hall |
| Program-- Bachelor of Science: Environmental Management | | | | | | | |
| | | Upon completion of this program a student will be able to demonstrate . . . | | | | The University Supports..... | |
| | Program Outcomes | 1. Factual and theoretical knowledge of chemistry, environmental science, and business-based management 2. Business and science-based practical knowledge and skills related to assessment management and environmental practices 3. Competence in the use of scientific tools of analysis and computers 4. Communication skills including 5. Information retrieval skills | Readiness for employment in business or industry as an environmental manager, plant manager for drinking water or wastewater | Readiness for graduate study in business or environmental science | Experience and familiarity with full range of chemical instrumentation for environmental and chemical analysis and for environmental research | An active and engaged faculty in chemistry and applied environmental applications of chemistry | Resources for the maintenance and support of the program including the science labs of Crawford Hall |
| Program-- Bachelor of Science: Environmental Science | | | | | | | |
| | | Upon completion of this program a student will be able to demonstrate . . . | | | | The University Supports..... | |

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| | Program Outcomes | 1. Factual and theoretical knowledge of chemistry, biology, and environmental science 2. Cross-disciplinary laboratory knowledge and skills 3. Competence in the use of science instruments and computers 4. Communication skills 5. Information retrieval skills 6. safe laboratory practices | Readiness for employment in business or industry as an environmental scientist, biological technician, physical science technician, pollution control specialist, laboratory chemist environmental specialist or environmental field technician. | Readiness for graduate study in environmental science, environmental chemistry, environmental toxicology, biochemistry or other chemistry related fields. | Experience and familiarity with full range of chemical instrumentation for environmental and chemical analysis and for environmental research | An active and engaged faculty in chemistry and applied environmental applications of chemistry | Resources for the maintenance and support of the program including the science labs of Crawford Hall and the Environmental Analysis Laboratory. |
| Program-- Bachelor of Science: Forensic Chemistry | | | | | | | |
| Upon completion of this program a student will be able to demonstrate . . . | | | | | | The University Supports..... | |
| | Program Outcomes | 1. Factual and theoretical knowledge of chemistry, forensics and criminal justice related to forensic analysis 2. Cross-disciplinary laboratory knowledge and skills 3. Competence in the use of science instruments and computers 4. Communication skills 5. Information retrieval skills 6. safe laboratory practices | Readiness for employment as a laboratory forensic chemist, crime scene investigator or law enforcement laboratory chemist | Readiness for graduate study in forensics, forensic analysis or criminalistics | Experience and familiarity with chemical instrumentation used for forensic, environmental and chemical analysis. | An active and engaged faculty in chemistry and the forensic applications of chemistry for criminalistics | Resources for the maintenance and support of the program including the science labs of Crawford Hall and the Environmental Analysis Laboratory. |
| Program-- Bachelor of Science: Integrated Science-Elementary Education | | | | | | | |
| Upon completion of this program a student will be able to demonstrate . . . | | | | | | The University Supports..... | |

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|--|-------------------------|--|--|--|--|---|---|
| | Program Outcomes | <p>1. Factual and theoretical knowledge of biology, chemistry, Earth/space science and physics; as well as educational pedagogy in science at the elementary level 2. Classroom and Lab knowledge and skills 3. Competence in the use of the tools of science 4. Communication skills including effective instructional practices for class and laboratory activities 5. Information retrieval skills 6. safe laboratory practices 7. A passing score on the Michigan Test for Teacher Certification for this subject-area</p> | <p>Readiness for employment as a science educator at the elementary level (classroom teacher all grades K-5, and science teacher grades 6-8)</p> | <p>Readiness for graduate study in education and science education</p> | <p>Experience and familiarity with the tools of science measurement and analysis, with a focus on instrumentation for education, analysis and research</p> | <p>An active and engaged faculty in chemistry and physics including science educators</p> | <p>Resources for the maintenance and support of the program including the science labs of Crawford Hall</p> |
| Program-- Bachelor of Science: Integrated Science-Secondary Education | | | | | | | |
| | | Upon completion of this program a student will be able to demonstrate . . . | | | | The University Supports..... | |

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|--|-------------------------|--|--|--|--|---|---|
| | Program Outcomes | <p>1. Factual and theoretical knowledge of biology, chemistry, Earth/space science and physics; as well as educational pedagogy in science at the elementary level 2. Classroom and Lab knowledge and skills 3. Competence in the use of the tools of science 4. Communication skills including effective instructional practices for class and laboratory activities 5. Information retrieval skills 6. safe laboratory practices 7. A passing score on the Michigan Test for Teacher Certification for this subject-area</p> | <p>Readiness for employment as a science educator at the secondary level (as science teacher for all content fields in science from grades 6-12)</p> | <p>Readiness for graduate study in education and science education</p> | <p>Experience and familiarity with the tools of science measurement and analysis, with a focus on instrumentation for education, analysis and research</p> | <p>An active and engaged faculty in chemistry and physics including science educators</p> | <p>Resources for the maintenance and support of the program including the science labs of Crawford Hall</p> |
| Program-- Bachelor of Science: Physical Science-Secondary Education | | | | | | | |
| | | Upon completion of this program a student will be able to demonstrate . . . | | | | The University Supports..... | |

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| | Program Outcomes | <p>1. Factual and theoretical knowledge of chemistry, physics and educational pedagogy in science</p> <p>2. Lab knowledge and skills</p> <p>3. Competence in the use of chemical and physics-based instruments and computers</p> <p>4. Communication skills including effective instructional practices for class and laboratory activities</p> <p>5. Information retrieval skills</p> <p>6. safe laboratory practices</p> <p>7. A passing score on the Michigan Test for Teacher Certification for this subject-area</p> | <p>Readiness for employment as a chemistry, physics and physical science teacher in classrooms at grade levels 6-12</p> | <p>Readiness for graduate study in chemistry, biochemistry, physics or physical science related fields, especially advanced study in science education</p> | <p>Experience and familiarity with full range of chemical and physics-based instrumentation for education, analysis and research</p> | <p>An active and engaged faculty in chemistry and physics including science educators</p> | <p>Resources for the maintenance and support of the program including the science labs of Crawford Hall</p> |
| Program-- Bachelor of Arts: Chemistry-Secondary Education | | | | | | | |
| | | Upon completion of this program a student will be able to demonstrate . . . | | | | The University Supports..... | |

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|--|-------------------------|---|--|---|---|---|---|
| | Program Outcomes | 1. Factual and theoretical knowledge of chemistry and educational pedagogy in science 2. Lab knowledge and skills 3. Competence in the use of chemical instruments and computers 4. Communication skills including effective instructional practices for class and laboratory activities 5. Information retrieval skills 6. safe chemical lab practices 7. A passing score on the Michigan Test for Teacher Certification for this subject-area | Readiness for employment as a chemistry teacher in classrooms at grade levels 6-12 | Readiness for graduate study in chemistry, biochemistry or chemistry related fields, especially advanced study in science education | Experience and familiarity with full range of chemical instrumentation for education, analysis and research | An active and engaged faculty in chemistry, including chemical educators | Resources for the maintenance and support of the program including the science labs of Crawford Hall |
| Program-Bachelor of Science: Geology | | | | | | | |
| Upon completion of this program a student will be able to demonstrate | | | | | | The University supports | |
| | | 1. theoretical and practical knowledge of geologic principles; 2. conduct field and laboratory studies; 3. produce and interpret geoscience maps and cross sections using geologic software; 4. communication skills | Readiness for geoscience employment such as: an environmental geologist, public sector geoscientist, mud logger, geophysicist, mine geologist, exploration geologist, etc. | Readiness for graduate school and competitiveness for graduate assistantships | Competence using field, laboratory and computer equipment to solve geologic problems | Scholarship where undergraduate students have the opportunity to engage in geoscience research, often publishable, working with faculty mentors | Resources for the maintenance and support of the geology program including field trip expenses and logistics, Crawford Hall laboratory equipment and facilities and appropriate technology and software |
| Program-Bachelor of Science: Geology | | | | | | | |
| Upon completion of this program a student will be able to demonstrate | | | | | | The University supports | |

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| | | 1. theoretical and practical knowledge of geologic principles; 2. conduct field and laboratory studies; 3. produce and interpret geoscience maps and cross sections; 4. earth science competence by obtaining a score on the Michigan Teacher Certification Training (MTTC) Examination (Secondary - Earth/Space Science) equal to or greater than the state average, 5. communication skills | Readiness for employment as an earth science teacher at the 6-12 grade level | Readiness for graduate studies in the geosciences and/or advanced study in science education | Competence using field, laboratory and computer equipment to solve geologic problems | Scholarship where undergraduate students have the opportunity to engage in research, often publishable, including science education research, working with faculty mentors | Resources for the maintenance and support of the geology program including field trip expenses and logistics, Crawford Hall laboratory equipment and facilities and appropriate technology and software |
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