



Center for Industry and Technology

DEPARTMENTS

Biological Sciences	249	Mathematics and Statistics	300
Chemistry	262	Occupational Safety and Health	307

PROGRAMS

GRADUATE

Master's
Professional Telecommunications and Business Management

Certificate
Professional Telecommunications Systems Management

Minor
Professional Telecommunications Management

Certificate
Business Geographic Information Systems

The Sustainability Studies minor is an interdisciplinary exploration of sustainability issues focusing on the environment and/or sustainable development. Integrating knowledge and experiences from the sciences, engineering, agriculture, business, humanities, and arts, the minor is designed to complement any major area of study by focusing on ecological health, sustainable agriculture, and economic sustainability.

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- BIO 103 Saving Planet Earth
- ENG 371 Literature and the Environment
- IDC 150 Issues in Sustainability Studies
- PHI 376 Environmental Ethics

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Choose two of the following:

- AGR 353 World Food, Agriculture and Society
- CET 284 Sustainable Design and Construction
- REC 450 Recreational Use of Natural Resources

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Chosen from the following with program coordinator approval: AGR 345, 378, 455; ANT 320; ARC 314; BIO 112, 330, 506, 578; CHE 502, 513; ECO 345, 410; ENT 286; GSC 507, 524; PSY 373; SOC 325, 380, 455.

V Six hours of the minor must be upper-level courses completed in residence at Murray State University.

Graduate Coordinator - Howard Whiteman
(270) 809-6753

The Sustainability Science program is an interdisciplinary master's program consisting of 24 credit hours, including 12 credit hours of graduate-level coursework. The program is designed to provide students with a strong foundation in sustainability science and to prepare them for careers in a variety of fields, including environmental management, public policy, and business. The program is a joint effort of the College of Business and the College of Arts and Sciences. For more information, please contact the Graduate Coordinator at (270) 809-6753.



Watershed Studies Institute
(270) 474-2272

The Watershed Studies Institute program in Watershed Science is an interdisciplinary master's program within the Jones College of Science, Engineering and Technology designed to prepare students for careers or for further graduate studies in the broader aspects of watershed management and science. The thesis course of study allows students to concentrate on one of four tracks: aquatic ecology, environmental chemistry, hydrologic





















Biology/Secondary Certification (Grades 8-12) Track

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(See *Academic Degrees and Programs*.)

University Studies selections must include:

- CHE 203 General Chemistry
- CHE 202 General Chemistry and Qualitative Analysis
- MAT 150 Algebra and Trigonometry
- EDP 260 Psychology of Human Development
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- EDU 103 Issues and Practices of American Education



and two of the following:

BIO 572 Herpetology

BIO 573 Ornithology

~~BIO 574 Herpetology 1408 BIO 574 4B - BIO~~

Elect vert (0 hrs) of 28 following:

and one of the following:

CSC 199 Introduction to Information Technology

PHY 570 Introduction to Computing App

and one of t5170505C/MC 25CID MICID 13944ctuB720 19 @ 54 5006005 Act8501BDC 2018 ActA895089050321A18C34









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CHE 488 Cooperative Education/Internship
or
CHE 495 Senior Research

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¹Required for area if not taken as a University Studies elective.

²CSC 232 or EGR 140 may be substituted.

³In conjunction with this program it is possible through careful course selection to obtain an M.S. degree with one additional year of study following the awarding of the B.S. degree. Students interested in this M.S. concentration should contact the graduate coordinator in the department no later than during the junior year.

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(See *Academic Degrees and Programs*.)

University Studies selections must include:

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MAT 250 Calculus and Analytic Geometry I¹
PHY 130 General Physics I¹ *and*
PHY 131 General Physics I Laboratory¹
PHY 132 General Physics II¹ *and*
PHY 133 General Physics II Laboratory¹

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CHE 100T Transitions
CHE 201 General College Chemistry
CHE 202 General Chemistry and Qualitative Analysis
CHE 305 Analytical Chemistry
CHE 312 Organic Chemistry I
CHE 320 Organic Chemistry II
CHE 352 Basic Chemical Instrumentation
CHE 403 Basic Physical Chemistry
CSC 235 Programming in C++²

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CHE 488 Cooperative Education/Internship
or
CHE 495 Senior Research

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¹Required for major if not taken as a University Studies elective.

²CSC 232 or EGR 140 may be substituted.

³At least one three-hour free elective must be chosen from outside Chemistry and may not be counted as a University Studies requirement.



The teaching specialization in chemistry is a path to secondary certification in chemistry, designed to accompany certification in another science content area. (All College of Education and Human Services secondary certification course requirements must be met.) The teaching specialization in chemistry meets and exceeds Murray State University's requirements for a minor in chemistry. **V** Even though this program exceeds Murray State University's requirements for a chemistry minor, in order for a chemistry minor to appear on a transcript, a minor must be declared, and all residential and graduation requirements must be met.

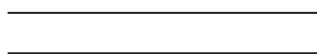
Requirements for teacher certification are established by the Kentucky Education Professional Standards Board. Students are cautioned that changes in these requirements may occur. Therefore, for the most current information, students should check with an advisor in the College of Education and Human Resources.







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CHE 100T Transitions
CHE 201 General College Chemistry Og ...





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- GSC 489 Cooperative Education/Internship
- GSC 507 Land Use Planning
- GSC 512 Remote Sensing
- GSC 521 Geographic Information Systems
- GSC 522 Digital Cartography
- GSC 534 Invertebrate Paleontology
- GSC 542 Watershed Ecology
- GSC 591 Special Problems
- GSC 592 Special Problems
- GSC 593 Special Problems

 MAT 150² (or above)
 CSC 101³ or CSC 199³

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 Board of Registration for Professional Geologists recommends the following courses to enhance performance on the Professional Geologist Examination.

- CHE 105 Introductory Chemistry
or
- CHE 201 General College Chemistry
- CHE 202 General Chemistry and Qualitative Analysis
- CSC 101 Introduction to Problem Solving Using Computers
 (or other computer science course)
or
- PHY 130 General Physics I

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¹Will count towards University Studies Global Awareness, Cultural Diversity, and the World's Artistic Tradition requirements.
²Will count towards University Studies Scientific Inquiry, Methodologies, and Quantitative Skills requirements.
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Upper Level Electives

Choose four of the following courses:

- EGR 340 Wave Analysis of Dynamic Systems
- EGR 342 Thermodynamics II
- EGR 344 Fluid Mechanics
- EGR 346 Heat Transfer
- EGR 359 Mechanics of Materials
- EGR 459 Mechanical Design
- ITD 102 CAD Applications

Upper Level Mathematics

Each student must complete a mathematics depth elective chosen from MAT 335, 440, 442, 450, 460, 508, 512, 513, 522, 523, 524, 525, 535, 538, 540, 541, 542, 545, 554, 570, or as approved by the department chair. Students with a Biomedical Engineering track must take MAT 135, 540, or 554 for this elective.

Upper Level Technical Electives

Each student must complete 18 hours of technical electives. A minimum of 12 technical elective credit hours must be obtained from EGR courses. Completion of a track is encouraged but not required.

Upper Level Physics

Upper Level Physics

This degree program has been approved by the Kentucky Education Professional Standards Board as a track for secondary education certification in physics. Students seeking certification via this Track must complete the Engineering Physics curriculum and the courses required for secondary certification as listed above. For current textbooks & current code











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ACCREDITED BY:

Technology Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012. (410) 347-7700

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(See *Academic Degrees and Programs*.)

University Studies selections must include:

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MAT 130 Technical Math I

PHY 130 General Physics I *and*

PHY 131 General Physics I Laboratory

PHY 132 General Physics II *and*

PHY 133 General Physics II Laboratory

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ECO 230 Principles of Macroeconomics

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GSC 101 The Earth and the Environment

MAT 230 Technical Math II

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CET 280 Plane Surveying

CET 284 Sustainable Design and Construction

CET 385 Construction Estimating I

CET 480 Construction Planning and Management

ENG 324 Technical Writing

ENT 100T Transitions

ENT 287 Statistics for Technology

ENT 358 Mechanical and Electrical Systems

ENT 382 Hydraulics

ENT 393 Engineering Economy

ENT 419 Senior Project I

IET 399 Professional Development Seminar I

IET 488 Cooperative Education/Internship

ITD 107 Introduction to Technical Drawing and Computer-Aided Drafting

MAT 330 Technical Math III

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CET 298 Strength of Materials

CET 370 Route Surveying

CET 481 Structural Steel Design

CET 482 Reinforced Concrete Design

CET 483 Construction Materials

CET 484 Soil Mechanics and Foundations

CET 410 Transportation Systems and Design

ENT 286 Introduction to Environmental Engineering Technology

Technical Electives (9 hrs)

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¹May be taken as a University Studies elective.

²This is a University Studies writing intensive course.

³This is a University Studies technology intensive course.

Mathematics/Secondary Certification (Grades 8-12) Track

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(See *Academic Degrees and Programs*.)

University Studies selections must include:

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- MAT 250 Calculus and Analytic Geometry I
- MAT 308 Calculus and Analytic Geometry II
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- PSY 180 General Psychology
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- EDP 260 Psychology of Human Development
- EDU 103



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- EDU 303 Strategies of Teaching
- EDU 403 Structures and Foundations of Education
- EDU 405 Evaluation and Measurement in Education⁴
- HEA 191 Personal Health⁵
- SEC 420 Practicum in Secondary Schools⁴
- SEC 421 Student Teaching in the Secondary School
- SEC 422 Extended Practicum⁶
- SED 300 Educating Students with Disabilities

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- ¹With a grade of B or better.
- ²This is a University Studies writing intensive course.
- ³This is a University Studies technology intensive course.
- ⁴EDU 405 and SEC 420 must be taken together and two semesters before student teaching.
- ⁵Department of Mathematics and Statistics requirement.
- ⁶Must be taken one semester before student teaching.

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(See *Academic Degrees and Programs*.)

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- MAT 100T Transitions
- MAT 250 Calculus and Analytic Geometry I¹
- MAT 308 Calculus and Analytic Geometry II¹
- MAT 309 Calculus and Analytic Geometry III¹
- MAT 312 Mathematical Reasoning²
- MAT 335 Matrix Theory and Linear Algebra
- MAT 338 Ordinary Differential Equations
- MAT 442 Introduction to Numerical Analysis
- MAT 540 Mathematical Statistics I³

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- A. Three (3 or 4 credit hour) courses selected from MAT courses numbered 400 or above.
- B. Five or six courses (at least 3 credit hours) related to the application of mathematics. Must total at least 18 hours and must be approved by the student's advisory committee.⁴

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Two courses in computer programming⁵ selected from a list approved by the Department of Mathematics and Statistics.

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- ¹May be taken as a University Studies elective.
- ²This is a University Studies writing intensive course.
- ³This is a University Studies technology intensive course.
- ⁴The program is very flexible. For example, possible tracks include, but are not limited to, an emphasis in either biology, chemistry, computer science, engineering physics, geoscience, statistics and finance, or actuarial science.
- ⁵Approved by the student's advisory committee. Will be a University Studies technology intensive course.





The department also offers the Master of Arts in teaching degree in mathematics. This program is designed for certified teachers who wish





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MAT courses, 700-level (3 hrs)
MAT courses, 600-level (15 hrs)

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- EDU 600 Introduction to Teacher Leadership
- EDU 631 Classroom and Management and Student Motivation
- EDU 633 Curriculum Development
- EDU 637 Instruction for Diverse Learners
- EDU 639 Research to Improve Student Learning^R
- EDU 640 Exit Seminar in Teacher Leadership

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Students must complete EDU 600 before enrolling in EDU 639.

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The Department of Mathematics and Statistics provides instruction in support of the M.A.Ed. in Secondary Teacher Leadership with a concentration in mathematics. Prospective students should contact the graduate coordinator in the College of Education for details on advising and graduate program design.

157 Collins Center
270-809-2488

Gary Morris 7 At eh, Byrd, Fender, Keller, Morris, Shah, Spicer, Wells, Wortham.

The Department of Occupational Safety and Health provides related curriculum offerings at the baccalaureate and master's levels. Service courses are offered for individuals majoring in other fields such as business, science, health, psychology, education, and engineering technology. The department also offers a technical minor and a Master of Science degree, including an online Master of Science program with an emphasis in safety management that is equivalent to the on-campus program. The degree programs are designed to provide the technical and professional knowledge required by individuals pursuing professional careers in accident prevention, loss-control management and supervision, inspection and control of occupational hazards, safety.





COM 384 Communication Skills for Professionals
COM 439 Conflict and Communication
CRJ 140 Introduction to Criminal Justice
CRJ 355 Security in Business and Industry
ENG 228 Standard English Usage
MGT 550 Human Resource Management
MGT 555 Training and Development
MGT 575 Labor Management Relations
OSH 330 Global Issues in OSH





