Environmental Engineering Technology (EVT)

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Environmental issues affect our health and our communities, as well as the sustainability of future generations and the earth itself.

Environmental concerns directly affect the operations of all types of industries, including parks and forest services, transportation, chemical facilities, defense and energy, construction, and, of course, environmental services.

Graduates of the Environmental Engineering Technology program earn an Associate of Applied Science degree and are prepared to enter positions in a wide range of industries, environmental restoration sites, government agencies, laboratories, consulting firms, and conservation districts.

Most curriculum courses, not including cooperative education courses, meet Ohio Environmental Protection Agency requirements for license renewal (U.S. EPA External Provider).

For more information, please contact the Engineering and Information Technologies Division at (513) 569-1743.

To apply for this program at Cincinnati State, visit the Admissions (http://www.cincinnatistate.edu/academics/admission/) section of the College website.

Environmental Engineering Technology (EVT)

Semester 1		**Lec**	**Lab**	**Credits**
EVT 105	Environmental Sampling (**B**)	2	3	3
FYE 1XX First Year Experience Elective (**B**)		1	0	1
CHE XXX Chemistry Elective (**B**)		3	3	4
MAT XXX Mathematics Elective 1 (**G**)		4	0	4
ENG 101	English Composition 1 (**G**)	3	0	3
EVS 110	Environmental Science: Conservation and Cleanup (**G**)	3	2	4
Semester 2				
EVT 170	Water and Wastewater Treatment and Analysis (**T**)	3	3	4
EVT 140	Environmental Regulations and Permits (**T**)	1	2	2
EVT 160	Solid and Hazardous Waste Management (**T**)	2	3	3
MAT XXX Mathematics Elective 2 (**B**)		4	0	4
EVT 150	Environmental Chemistry (**B**)	2	3	3
Semester 3				
XXX XXX Cooperative Education Elective (**T**)		1	40	2
Semester 4				
EVT 240	Fluid Mechanics (**T**)	3	3	4
EVS 120	Environmental Geology (**T**)	3	2	4
EVT 220	Air Pollution Control (**T**)	2	3	3
EVT 230	Treatment Technologies (**T**)	2	2	3
Semester 5				
EVT 292	Full-Time Cooperative Education 2: Environmental Engineering Technology (**T**)	1	40	2
Semester 6				
EVT 155	Site Mapping and GIS (**T**)	2	3	3
XXX XXX Statistics Elective (**T**)		1	2	2
ENG 10X English Composition Elective (**G**)		3	0	3
XXX XXX Arts/ Humanities or Social/ Behavioral Science Elective (**G**)		3	0	3
XXX XXX Technical Elective (**T**)		1	2	2
Total Credits:		**50**	**116**	**66**

Electives

First Year Experience Elective		
FYE 100	College Success Strategies: Overview	1
FYE 105	College Success Strategies: Overview and Application	2
FYE 110	College Success Strategies: Practice and Application	3
Chemistry Elective		
CHE 110	Fundamentals of Chemistry	4
CHE 121 & CHE 131	General Chemistry 1 and General Chemistry 1 Lab	5
Mathematics Electives		**8**

Select one the following series:

MAT 125 & MAT 126	Algebra and Trigonometry and Functions and Calculus	8
Or		
MAT 151 & MAT 152	College Algebra and Trigonometry	8
Or		
MAT 251 & MAT 252	Calculus 1 and Calculus 2	10
Cooperative Education Elective		**2**
Select one of the following:		
CIT 190 & EVT 191	Career Preparation: Engineering and Information Technologies and Part-Time Cooperative Education 1: Environmental Engineering Technology	2
EVT 191 & EVT 192	Part-Time Cooperative Education 1: Environmental Engineering Technology and Part-Time Cooperative Education 2: Environmental Engineering Technology	2
EVT 291	Full-Time Cooperative Education 1: Environmental Engineering Technology	2
Statistics Elective		
EVT 180	Environmental Statistics	2
MAT 131	Statistics 1	3
English Composition Elective		
ENG 102	English Composition 2: Contemporary Issues	3
ENG 103	English Composition 2: Writing about Literature	3
ENG 104	English Composition 2: Technical Communication	3
ENG 105	English Composition 2: Business Communication	3
Arts/Humanities Elective or Social/Behavioral Science Elective		
Any ART, CULT, FRN, LIT, MUS, PHI, REL, SPN, THE		3
or, Any CRJ, ECO, GEO, HST, POL, PSY, SOC		3
Technical Elective		
Any CET, CMT, EVS, EVT, LH, or other course approved by Program Chair		2

Some courses are offered in alternative versions identified with a letter after the course number-- for example, ENG 101 and ENG 101A.

- This curriculum displays only course numbers without the added letter.
- The alternative version, when available, meets the requirements of the course version without the added letter.

The letters G, B, and T (displayed after course titles or elective descriptions) identify types of courses required by the Ohio Department of Higher Education as part of an associate's degree curriculum.

G = General Education course in this curriculum

B = Basic Skills course in this curriculum

T = Technical course in this curriculum

Environmental Engineering Technology (EVT, EVTS, EVTW)

- Ability to apply knowledge, techniques, skills, and modern tools in environmental engineering technology activities.
- Ability to apply a knowledge of mathematics, science, engineering, and technology to environmental engineering technology problems.
- Ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments.
- Ability to function effectively as a member of a technical team.
- Ability to identify, analyze, and solve environmental engineering technology problems.
- Ability to apply written, oral, and graphical communication; and ability to identify and use appropriate technical literature.
- Understanding of the need for self-directed continuing professional development.
- Understanding of and commitment to address professional and ethical responsibilities, including a respect for diversity.
- Commitment to quality, timeliness, and continuous improvement.

Faculty

Program Chair

Ann Gunkel, PhD
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Co-op Coordinators

Jennifer Geiger, BS
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Advisors

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Carole Womeldorf, PhD
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EVS Courses

EVS 110 Environmental Science: Conservation and Cleanup
4 Credits. 3 Lecture Hours. 2 Lab Hours.
A course on environmental science as it affects human activity and the environment. Topics include: drinking water and wastewater treatment, air pollution, energy, conservation, solid and hazardous waste management, and risk assessment. Students provide transportation to off-campus field trips.
Prerequisites: ENG 085 or appropriate placement
Ohio Transfer Module Approved

EVS 120 Environmental Geology
4 Credits. 3 Lecture Hours. 2 Lab Hours.
A course on the relationship of applied geology to the human environment. Topics include: plate tectonics, soils, groundwater and surface water, natural disasters and glacial geology, and resource protection from contamination. Students provide transportation to off-campus field trips.
Prerequisites: ENG 085 or appropriate placement
Ohio Transfer Module Approved

EVS 130 Environmental Science: Ecology and Ecosystems
4 Credits. 3 Lecture Hours. 2 Lab Hours.
A course on environmental science and ecology. Topics include: types of ecosystems and how they function, elementary soil science, biodiversity, and population growth and sustainability. Students provide transportation to off-campus field trips.
Prerequisites: ENG 085 or appropriate placement
Ohio Transfer Module Approved

EVT Courses

EVT 105 Environmental Sampling
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on sampling requirements and techniques. Topics include: sampling groundwater, surface water, drums, sediments, soil, and air; site assessment; and field testing. Students provide transportation to off-campus field trips. Students who complete the course successfully earn a USEPA certificate.
Prerequisites: ENG 085 and MAT 093 or appropriate placements

EVT 115 OSHA 40-Hour Course
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on the OSHA-specific requirements under 29 CFR 1910.120 for 40-Hour Hazardous Waste Site Training. Topics include: avoiding injury on a hazardous waste site, and basic concepts for health and safety programs. Students who complete the course successfully earn a certificate.
Prerequisites: ENG 085 and MAT 093 or appropriate placements
Instructor Consent Required

EVT 125 Restoration Ecology: Sustainable Sites
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on environmental design principles and sustainable development. Topics include: federal, state, and local issues and standards; and managing introduced, exotic, and invasive species. Students provide transportation to off-campus field trips.
Prerequisites: EVS 110 or EVS 130

EVT 135 Restoration Ecology: Rain Gardens
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on rain garden design and construction techniques that harvest rain water from local watersheds. Topics include: baseline analysis, site preparation, plant selection, and study of components in various ecoregions. Students provide transportation to off-campus field trips.
Prerequisites: EVS 110 or EVS 130

EVT 140 Environmental Regulations and Permits
2 Credits. 1 Lecture Hour. 2 Lab Hours.
A course on federal, state, and local environmental laws with emphasis on related computer concepts and applications. Topics include: TSCA, FIFRA, OSHA, CAA, CWA, SDWA, CERCLA, and RCRA.
Prerequisites: EVS 110 and (ENG 101 or ENQ REQC)

EVT 145 Restoration Ecology: Native Vegetation
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on native trees, shrubs, and vines that have commercial value for sustainable use. Topics include: proven landscape species, their uses in the tri-state area, and invasive species of various ecoregions. Students provide transportation to off-campus field trips.
Prerequisites: EVS 110 or EVS 130

EVT 150 Environmental Chemistry
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on organic chemistry and chemical principles of environmental systems. Topics include: nomenclature, geochemistry, atmospheric chemistry, organic and inorganic air pollutants, toxicological chemistry, resources, energy, and analysis of environmental samples using chemical instrumentation.
Prerequisites: CHE 110 or CHE 121

EVT 155 Site Mapping and GIS
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on mapping techniques for the environmental field. Topics include: map concepts, coordinate systems, elevation contours, and terrain modeling. Course activities include manual drafting, basic principles of surveying, and an introduction to CAD and GIS software.
Prerequisites: MAT 125 or MAT 151 or appropriate placement

EVT 158 Fundamentals of Industrial Hygiene
2 Credits. 1 Lecture Hour. 2 Lab Hours.
A course on techniques for recognizing, evaluating, and controlling health and safety hazards in the workplace. Topics include: radiation safety, noise, solvents, biological hazards, and video display terminal (VDT) hazards.
Prerequisites: EVS 110

EVT 160 Solid and Hazardous Waste Management
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on concepts and techniques for solid and hazardous waste disposal facilities. Topics include: waste minimization, composting, recycling, and landfilling; principles and practices for storage, transport, treatment, and disposal of hazardous wastes; regulations and permits; and emerging technologies. Students provide transportation to off-campus field trips.
Prerequisites: EVS 110, and CHE 110 or CHE 121

EVT 165 Calculations for Water Operators
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on mathematical applications for water treatment plant processes including water sources and storage, coagulation and flocculation, sedimentation, filtration, chlorination, fluoridation, and softening. Topics include applied volume, flow, and velocity; chemical dosage; loading rates; detention and retention; and pumping.
Prerequisites: EVS 110 and MAT 125 or MAT 151 or appropriate placement

EVT 166 Calculations for Wastewater Operators
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on calculations for wastewater treatment applications. Topics include: volumes, flow, and velocity; conversions; pumping and loading rates; F/M ratio; sludge age; MCRT; and efficiency.
Prerequisites: EVS 110 and MAT 125 or MAT 151 or appropriate placement

EVT 168 Radiation Safety
2 Credits. 1 Lecture Hour. 2 Lab Hours.
A course on radiation safety and protection. Topics include: the interaction of radiation with matter, biological effects, types of radioactivity, dosimetry, shielding calculations, and radiation measurements.
Prerequisites: EVS 110

EVT 170 Water and Wastewater Treatment and Analysis
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course on scientific and engineering principles for water quality control. Topics include: environmental microbiology; bioremediation; microbes as indicators of pollution; and physical, chemical, and biological analysis. Students provide transportation to off-campus field trips.
Prerequisites: EVS 110, and CHE 110 or CHE 121

EVT 171 Environmental Mountain Ecology 1
2 Credits. 2 Lecture Hours. 0 Lab Hour.
A course on principles of ecology and pollutant dispersion as they pertain to mountain ecosystems, and the environmental impact of human activities on mountain ecosystems.
Prerequisites: EVT 105 and EVS 120

EVT 172 Environmental Mountain Ecology 2
3 Credits. 1 Lecture Hour. 6 Lab Hours.
A continuation of EVT 171. Students participate in field experience that includes a trip to the mountainous regions of the western United States. Students pay for travel-related expenses.
Prerequisites: EVT 171
Instructor Consent Required

EVT 175 Watershed Management
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on developing watershed action plans. Topics include: water quality monitoring, stream bank stabilization, flood management strategies, habitat restoration, and control of combined and sanitary sewer overflow. Students provide transportation to off-campus field trips.
Prerequisites: EVT 105, and CHE 110 or CHE 121

EVT 180 Environmental Statistics
2 Credits. 1 Lecture Hour. 2 Lab Hours.
A course on statistical methods used in environmental pollution monitoring. Topics include: computer concepts and applications emphasizing environmental data.
Prerequisites: EVS 110 and MAT 125 or MAT 151 or appropriate placement

EVT 185 Supervisory Management in Environmental Fields
2 Credits. 1 Lecture Hour. 2 Lab Hours.
A course on concepts and practices of management as they apply to the environmental field. Topics include: problem solving, communication skills, delegation and motivation, unions, and manager-employee relationships.
Prerequisites: EVS 110 and (ENG 101 or ENG REQC)

EVT 187 Materials Transportation Safety and Security
2 Credits. 1 Lecture Hour. 2 Lab Hours.
A course on safety and security during the transport of hazardous substances. Topics include: Hazardous Materials Transportation Act, Resource Conservation and Recovery Act, Transportation Security Administration, aviation security, and shipping protocols. Students provide transportation to off-campus field trips.
Prerequisites: EVT 105

EVT 191 Part-Time Cooperative Education 1: Environmental Engineering Technology
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their first part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: None

EVT 192 Part-Time Cooperative Education 2: Environmental Engineering Technology
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their second part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: EVT 191

EVT 193 Part-Time Cooperative Education 3: Environmental Engineering Technology
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their third part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: EVT 192

EVT 194 Part-Time Cooperative Education 4: Environmental Engineering Technology
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their fourth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: EVT 193

EVT 195 Part-Time Cooperative Education 5: Environmental Engineering Technology
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their fifth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: EVT 194

EVT 196 Part-Time Cooperative Education 6: Environmental Engineering Technology
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their sixth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: EVT 195

EVT 210 Industrial Waste Treatment
2 Credits. 1 Lecture Hour. 2 Lab Hours.
A course on the responsibilities of the industrial wastewater treatment plant operator. Topics include: the activated sludge process, physical-chemical treatment, instrumentation, industrial waste monitoring, waste treatment processes, and maintenance.
Prerequisites: EVT 170

EVT 215 Utilities Safety and Security
2 Credits. 1 Lecture Hour. 2 Lab Hours.
A course on the safety and security of the utility systems in the United States in the event of natural disasters or terrorist or wartime attack. Topics include: protection of drinking water systems, wastewater treatment systems, and energy supplies.
Prerequisites: EVT 170

EVT 220 Air Pollution Control
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on monitoring permitting and control of air releases. Topics include: air quality management, health and environmental effects, indoor air pollution, pollen and mold counts, control and sampling equipment, stack testing, and data analysis. Students provide transportation to off-campus field trips.
Prerequisites: EVT 150

EVT 225 Environmental Mapping
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on mapping and resource inventory for the environmental field. Topics include: map projections, world coordinates, watershed delineation, GIS data analysis and queries, and remote sensing. Students use conventional surveying and GPS equipment for data collection, and computer mapping CAD and GIS software for data analysis.
Prerequisites: EVT 155

EVT 230 Treatment Technologies
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on principles and applications of mainstream treatment technologies used to prevent, monitor, and control pollution from industries and government facilities. Topics include: physical, chemical, thermal, and biological treatment methods. Students provide transportation to off-campus field trips.
Prerequisites: EVT 170

EVT 235 Stormwater Management
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on the infrastructure of stormwater control. Topics include: surface water hydrology, historical development of drainage control, FEMA and local flood design criteria and control methods, storm sewers, open channel, culvert conveyance, detention systems and calculations, and post-construction BMPs.
Prerequisites: EVT 225 and EVT 240

EVT 237 Environmental Impact of Weapons of Mass Destruction
2 Credits. 1 Lecture Hour. 2 Lab Hours.
A course on understanding weapons of mass destruction and recovery following an attack. Topics include: chemical and biological warfare agents; radiation dispersal devices; and detection, decontamination, and disposal of these agents. Students provide transportation to off-campus field trips.
Prerequisites: EVT 105 and EVT 170

EVT 240 Fluid Mechanics
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course on engineering properties of fluids including kinematics and dynamics, fluid flow, buoyancy, and stability. Topics include: Bernoulli's equation and the energy equation; Reynold's number; energy losses; and series, parallel, and open channel flow.
Prerequisites: MAT 126 or MAT 152 or appropriate placement

EVT 245 Operation of Water Treatment Plants
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on efficient operation of water treatment plants that helps students prepare for certification exams. Topics include: proper installation, inspection, operation, maintenance, repair, and management of water treatment plants; corrosion control; control of trihalomethanes; and water sample analysis.
Prerequisites: EVT 165

EVT 246 Operation of Wastewater Treatment Plants
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on efficient operation of wastewater treatment plants that helps students prepare for certification exams. Topics include: start-up, daily operations, interpretation of lab results, and possible approaches to solving operational problems.
Prerequisites: EVT 166

EVT 247 Advanced Sampling and Analysis
2 Credits. 1 Lecture Hour. 2 Lab Hours.
A course on sampling equipment and methods used to evaluate hazards after natural disasters. Topics include: equipment and instruments used to detect biological and chemical warfare agents. Students provide transportation to off-campus field trips.
Prerequisites: EVT 105 and EVT 170

EVT 250 Water Collection and Distribution Systems
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on operating and controlling water delivery and wastewater collection systems. Topics include: gravity and pumped lines; storage and holding tanks; pumps; system monitoring, repair, and rehabilitation; water system depressurization; backflow prevention; metering; sewer overflows; and gaseous buildup.
Prerequisites: EVT 240

EVT 255 Stormwater Control Technologies
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on best practices in stormwater management including design, installation, construction, and maintenance. Topics include: porous pavements, subsurface infiltration, bioretention basins, wetlands, soil bioengineering, and cost effectiveness of methods. Students provide transportation to off-campus field trips.
Prerequisites: EVT 225

EVT 257 Environmental Risk Assessment
2 Credits. 1 Lecture Hour. 2 Lab Hours.
A course that utilizes risk assessment methods to evaluate and manage danger in the event of chemical, biological, or radiological exposure. Topics include: operational risk management approaches, and understanding toxicological values. Students provide transportation to off-campus field trips.
Prerequisites: EVT 160 and EVT 220

EVT 291 Full-Time Cooperative Education 1: Environmental Engineering Technology
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their first full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: None

EVT 292 Full-Time Cooperative Education 2: Environmental Engineering Technology
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their second full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: EVT 291

EVT 293 Full-Time Cooperative Education 3: Environmental Engineering Technology
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their third full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: EVT 292

EVT 294 Internship 1: Environmental Engineering Technology
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their first unpaid field learning experience related to their degree. Students must follow applicable policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CIT 190

EVT 295 Internship 2: Environmental Engineering Technology
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their second unpaid field learning experience related to their degree. Students must follow applicable policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: EVT 294