Land & Water Resources - Environmental Stewardship and Rural Planning Major Diploma

Description

The Land and Water Resources program prepares its graduates for careers in land reclamation, environmental stewardship and rural planning emphasizing environmentally sustainable land management practices.

Program Learning Outcomes

Upon successful completion of this program, students will be able to:

1. Manage environmental projects individually and collaboratively
2. Use critical thinking to solve land resource problems
3. Manage information using documentation and organizational skills
4. Communicate using written, oral and multimedia methods appropriate to the workplace
5. Access and evaluate environmental information
6. Apply professional, environmental and corporate ethics to the workplace
7. Apply chemistry and mathematical principles to land resource management
8. Manage plant communities
9. Manage watersheds and water quality
10. Analyze soil landscapes
11. Manage natural and agricultural ecosystems
12. Apply statutes, regulations and directives to land-use issues
13. Use tools, machinery, and instrumentation in land management
14. Assess environmental pollution
15. Plan rural land use
16. Demonstrate professionalism

Requirements:

TERM 1

Course Credits
(Total Credits:15)

EVS 1210 Applied Ecology (3-2-0 hrs) 3

This course provides an introduction to ecological principles at the species, population, community and ecosystem levels. Specific application of ecology to sustainability and the management of forest and grassland ecosystems are studied.

GPS 1200 GPS, Site Mapping and Graphics (0-5-0 hrs) 3

In this course Global Positioning System (GPS) is used to navigate to site locations, and to record the location of features in the field. A variety of field measurement instruments, field notes and sketching are employed to collect site information. Data is processed in mapping programs to prepare maps in selected coordinate systems and to acquire land information from survey plans and air photos. The course requires significant walking outdoors in a variety of weather conditions, using equipment to collect on-site data.

PLS 1010 Plant Science Principles (3-2-0 hrs) 3

This foundation course details plant morphology, physiology and taxonomy. Students learn how structures and processes affect overall plant growth and response to the surrounding environment. A dichotomous key is used to identify unknown plant species.

SOI 1000 Fundamentals of Soil Science (3-2-0 hrs) 3

This course encompasses the study of soil formation, soil properties and the characteristics and distribution of prairie soil resources. Students will also be introduced to soil classification, soil fertility and sustainable soil management.

WTR 1330 Water Fundamentals (3-2-0 hrs) 3

This course is an introduction to the science and issues of water resource management. Topics include the properties of water, surface and groundwater hydrology, water quality standards, water quality analysis and sampling, and the protection of water resources.

TERM 2

Course Credits
(Total Credits:15)

AGN 1540 Introductory Pest Management (3-2-0 hrs) 3

Students will study the principles of pest management in agricultural cropping systems. They will learn the basic concepts of integrated pest management and principles guiding the safe use of pesticides. Learners will also focus on the identification of selected weeds, diseases and insects of field crops in western Canada.

Pre-requisite : AGN - 1240 :or

Pre-requisite : PLS - 1010 :and

Pre-requisite : SOI - 1000 :

COM 1020 Workplace Communication (3-0-0 hrs) 3

In this course students develop writing and presentation skills. Students will apply rules of grammar, spelling, punctuation and mechanics in the development of letters, email and short reports as well as other documents relevant to their industry. Students will demonstrate strategies and techniques for creating informative and persuasive presentations.

CHE 1020 Environmental Chemistry (3-2-0 hrs) 3

Students will study a range of topics in inorganic and organic chemistry including nomenclature of functional groups, stoichiometry, solutions, acids and bases, equilibrium reactions and transport mechanisms. The topics are linked to agricultural and environmental applications and provide a basis for the further study of soils, plants, water and contaminants.

EVS 1730 Land Reclamation and Ethics (3-2-0 hrs) 3

This course presents an overview of reclamation issues, regulations and field practices as well as the application of professional and environmental ethics to workplace situations. Special attention is given to wellsite, pipeline, oilsands, and open pit mining operations.

LUP 1620 Land Systems and Legislation (3-2-0 hrs) 3

Legislation and land tenure systems for private, crown and aboriginal lands are examined. Understanding the functions of government and the development of environmental legislation helps prepare students for careers in land and water resource management.

TERM 3

Course Credits
(Total Credits:15)

EVS 2000 Environmental Field School and Technical Reporting (2.6-3.2-0 hrs) 3

Learners will undertake comprehensive environmental field data collection and investigations in Grassland, Parkland and Forested Natural Regions. Field data will be analyzed using various methods and technologies. Reports will be presented, summarizing field work. Learners will gain scientific and technical writing skills and practice career advancement strategies, culminating in a professional portfolio.

Pre-requisite : GPS - 1200 :and

Pre-requisite : SOI - 1000 :and

Pre-requisite : PLS - 1010 :and

Pre-requisite : WTR - 1330 :

LUP 2610 Rural Development Practices (2.6-1.73-0 hrs) 3

This course develops skills required for rural planning. Planning and development application scenarios provide hands-on experience in individual and group settings. Environmental principles

and trends are examined, as they relate to the rural municipal planning process.

Pre-requisite : LUP - 1620 :

Corequisite : LUP - 2620 :

LUP 2620 Applied Land Use Planning (2.6-2.6-0 hrs) 3

This is a capstone course that applies the theories of rural planning to practical examples. Focus is placed on developing skills in problem solving, positive communication and conflict resolution. Learners work on investigating and solving planning issues individually and in groups. Both oral and written presentations are made of their work. Various CAD design and GIS tools are used to support the Land Use Planning process.

Corequisite : LUP - 2610 :

PLS 2410 Native Plants of Alberta (2.6-1.73-0 hrs) 3

An introduction to the importance, role and use of dominant native plant species on rangeland and forested areas within Alberta's ecoregions. Students learn to identify both non-vascular and vascular species in selected plant families using dichotomous plant keys. The processes to select and propagate native species for re-vegetation purposes are described.

Pre-requisite : PLS - 1010 :and

Pre-requisite : EVS - 1210 :

WTR 2330 Water Quality (2.6-1.73-0 hrs) 3

Students will investigate the physical, chemical and biological characteristics of water and their environmental and economic impacts. Monitoring systems and groundwater remediation methods are introduced along with field experiences in water quality data collection from surface and groundwater sources. Laboratory skills in general microbiology and water analysis are a major emphasis of the course.

Pre-requisite : WTR - 1330 :

TERM 4

Course Credits
(Total Credits:15)

AGN 2600 Soil Management and Crop Production (3-2-0 hrs) 3

This course will describe the production practices and principles of annual crop and perennial forage crop production and develop skills in soil management, soil conservation and plant nutrition in sustainable agricultural systems. Students will identify major field crops, and their adaptations in western Canada, while discussing factors that lead to soil degradation and the production practices that can mitigate these problems.

Pre-requisite : PLS - 1010 :

EVS 2560 Environmental Statistics and Database Management (2-3-0) 3

This course is an introduction to basic statistical methods and data management practices in land management and environmental science. Students will learn how to work with spreadsheet and database software. Major statistical topics include central tendency, measures of dispersion, linear regression, correlation analysis and hypothesis testing. Students will design and conduct experiments to facilitate some of the statistical and database learning.

GIS 1300 GIS Tools (0-5-0 hrs) 3

This course introduces the concepts and applications of GIS technology (Geographic Information Systems). The student will gain hands-on experience using desktop and online GIS software in a computer lab environment. Students will use datasets from commercial sources for GIS projects. The GIS will be used to view, manage, and query spatial data, and to create various map outputs suitable for reports and presentations.

SOI 2340 Soil Classification & Mapping (3-2-0 hrs) 3

A study of soil genesis, morphology, and classification with particular focus on the Canadian System of Soil Classification (CSSC). Emphasis will be placed on the classification of soils by observing and measuring real soil properties that reflect processes of soil formation and environmental factors. Students will also be introduced to the concepts and procedures involved in mapping soils and interpreting soil resource inventory information.

Pre-requisite : SOI - 1000 :

WTR 2630 Watershed Management (3-2-0 hrs) 3

The 'watershed approach' is explored as a strategy for managing aquatic resources. Content areas include state-of-the-watershed assessments, alternatives for managing water quantity, alternatives for managing water quality, methods for restoring aquatic ecosystems, and watershed planning processes. A culminating project requires students to choose a watershed for which an environmental issue of concern is identified and addressed through an appropriate management plan.

Pre-requisite : WTR - 1330 :

Graduation Requirements

- Completion of 60 credits
- Completion of all required courses and credits as per Program of Study
- Cumulative G.P.A. of 2.00 or better
- Satisfactory completion of occupational experience and/or assignment, if required
- Effective January 1, 2017 the course EVS 2740 is being replaced with EVS 2750. Credit will given to those students who have already completed EVS 2740 prior to December 31, 2016.
- Note: EVS 2730 Outline #1133 is effective until June 30, 2017. Shows as Historically as EVS 2730 Managing Contaminated Sites. Effective June 30, 2017 the course name changes to EVS 2730 Environmental Site Assessment.
- Note: AGN 2420 and SOI 2500 will be effective until June 30, 2018. Credit for these courses will be given to students that successfully complete the two courses and graduate in April 2018.
- Note: AGN 2600 and EVS 2560 will be required course for students entering the program in Fall 2017. Students will take these courses in the Winter Term of 2019.

Changes to this Program

Every effort has been made to ensure that information in this program is accurate at the time of publication. The College reserves the right to change programs if it becomes necessary so that program content remains relevant. In such cases, Olds College will provide clear and timely notice of the changes.

Effective Date: 07/01/2018 to Present

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