Selkirk College
School of Environment and Geomatics (ENVR)

Integrated Environmental Planning Technology Diploma (IEP)

ENVR 1 Fall

ENVR 150   Hydrology I

MATH 160   Technical Math

ENVR 160   Surveying and Field Measurements

ENVR 162   Applied Botany and Ecosystem Classification

ENVR 164   Applied Geology and Geomorphology

ENVR 190   Computer Applications I

TWC 150   Introduction to Technical Communications I

ENVR 1 Winter

MATH 190   Resource Statistics

ENVR 154   Applied Mapping and Remote Sensing

ENVR 161   Global Positioning Systems and Navigation

ENVR 158   Introduction to GIS

ENVR 170   Fish and Wildlife Ecology

TWC 151   Introduction to Technical Communications II

ENVR 163   Terrestrial Ecology and Biology

IEP Second-Year Courses

IEP Spring

IEP 276   Ecological Restoration and Remediation

IEP 277   Environmental Planning Applications

IEP Fall

IEP 280   Environmental Chemistry

IEP 266   Applied Microbiology

IEP 250   Environmental Planning Applications I

IEP 260   Systems Ecology

IEP 270   GIS Applications I

MATH 291   Resource Statistics II

IEP Winter

IEP 200   Field trip study

IEP 251   Environmental Planning Applications II

IEP 255   Hydrology II

IEP 281   Air and Water Pollution Chemistry

IEP 271   GIS Applications II

IEP 290   Environmental Sustainability

IEP 280   Applied Research Project

MATH 140   Calculus I for Social Sciences

ENVR First-Year Courses

ENVR 1 Fall

ENVR 150   Hydrology I

This course is an introductory study of water in our environment. Learners will cover the natural processes which affect the hydrologic cycle; practical applications in collection and analyses of field and laboratory data; and use of standard techniques and equipment common in the environmental industry.

MATH 160   Technical Math

This is an applied math course, focusing on the technical math skills required in renewable resources work. Topics include: computation, 2-D and 3-D trigonometry, conversion factors, derived and empirical formulas, exponentials and logarithms, and map scales.

ENVR 160   Surveying and Field Measurements

This course covers the practical use of common survey instruments and techniques used by environmental management technicians. Students will cover the use and maintenance of basic surveying instruments and equipment; measurement of distance, direction, and elevation; and obtaining and recording topographic and planimetric data. Students will cover measurement and the sampling methods used to assess, classify, and evaluate vegetation of forest and range land, wildlife populations, streams, and air and water quality. Emphasis is placed on proper techniques for field plot implementation, collection methods for various types of data, and the proper use of measurement equipment.

ENVR 162   Applied Botany and Ecosystem Classification

This course is an introduction to the basics of Botany and Forest Ecology. Topics include plant identification of approximately 100 native plants that occur in the West Kootenay. Ecosystem description follows the Biogeoclimatic Ecosystem Classification system. Lectures cover topics in basic cell biology, photosynthesis, respiration, transpiration, translocation, ecosystem classification and the distribution of various ecosystems in British Columbia. Approximately 70% of labs occur in the field.

ENVR 164   Applied Geology and Geomorphology

The course will cover identification of common rocks and minerals, landforms and soils of British Columbia. Learners will be introduced to the study of physical geology and geomorphology in relation to management of the forest environment and landscape. Learners will gain skills and knowledge in rock and mineral identification, describing physical and chemical qualities of soils, and landform/terrain identification and classification. Skills will also be developed with respect to interpretation of geology, landforms, and soils for environmental management.

ENVR 190   Computer Applications I

This course builds upon the basic computer concepts required by the computer competency prerequisite. Students will receive training in advanced computer applications and techniques specific to the environmental technology programs. Emphasis will be placed on the use of word processing,

spreadsheets, database applications, web design, and presentation software. Common software use includes Microsoft Office and Open Office.

TWC 150   Introduction to Technical Communications I

A review of basic English skills is undertaken in this course. Also included is an introduction to general principles in written technical communication as they apply to environmental technology. Classroom sessions focus on developing writing skills, academic research and documentation, the organization and interpretation of data, oral presentation skills, and job search techniques.

ENVR 1 Winter

MATH 190   Resource Statistics

This course covers standard statistical tests and techniques, and the application of these statistical measures in renewable resources management. Students will learn how to summarize data (both numerically and graphically), basic of probability, use of several discrete and continuous distributions (including the normal distribution) to calculate probabilities, and how to infer information about a population by performing confidence intervals and hypothesis tests.

ENVR 154   Applied Mapping and Remote Sensing

This course emphasizes the practical application of maps and air photos in resource management. Students become familiar with types of maps and air photos, indexing systems, using maps and air photos in the field, map reading and measuring techniques, photo interpretation and measuring techniques, obtaining data for mapping, stratification of air photos, and remote sensing techniques. This course will also cover web-based remote sensing technologies and applications in environmental management.

ENVR 161   Global Positioning Systems and Navigation (New Course)

This course will cover theory and application of Global Positioning Systems in environmental management. Students will learn techniques to mark and navigate using handheld GPS. In addition, the course will cover techniques for uploading and downloading waypoint files and tracks to various software packages and displaying the results in digital and paper map applications. Use of handheld GPS units to collect fixed area survey data will be covered. As well, students will learn techniques for safe field navigation in remote field settings using map, compass and GPS equipment.

ENVR 158   Introduction to GIS

This course will provide training in computer drafting, Geographic Information Systems (GIS) and Global Positioning Systems (GPS) relevant to the environmental technology field. Emphasis will be placed on developing hands-on expertise with drafting and GIS Software such as ArcGIS and Softree. GPS data collected in the field will be integrated into mapping exercises for analysis and display.

ENVR 170   Fish and Wildlife Ecology

This course will cover identification and ecology of vertebrate animals, habitat requirements, and habitat disturbance implications. Learners will gain experience in applying guidelines and management strategies to minimize impact of other resource uses on fish and wildlife habitat and species.

TWC 151   Introduction to Technical Communications II

This course is an introduction to general principles in written technical communication and oral presentation techniques. Lectures focus upon business correspondence, the informal and formal report, technical style, and graphic illustration. Students practice delivery techniques for oral presentations of technical data in the environmental technology fields. Collaborative activities and teamwork skills are practiced and encouraged.

ENVR 163   Terrestrial Ecology and Biology

This course builds upon the concepts from ENVR 162 with further studies of local forest ecosystems. Students will identify key forest structural components and study the role that disturbance (such as fire), environmental gradients, and competition play in defining a species' niche. Participants will also examine the role of primary and secondary growth, nutrient uptake, reproduction, and survival mechanisms for plants. Winter plant identification, ecosystem form and function, and plant adaptations to timberline will also be examined. A practical field based assignment will form a major portion of the term assessment.

IEP Spring

IEP 276   Ecological Restoration and Remediation (New Course)

This course will cover applied ecological restoration and remediation techniques common in the environmental planning fields. Restoration project planning and implementation will follow techniques developed by the Society for Ecological Restoration (SER). Topics covered will include project scoping and plan development, field data collection, plant propagation techniques, project implementation in the field, routine and intensive monitoring, and report preparation. Learners can expect to be in the field every day and working on data collection and synthesis during the evenings. This is an intensive 32 hour course offered in a one-week time block in the spring semester.

IEP 277   Environmental Planning Applications (New Course)

This course will cover an environmental planning topic with a field focus. Learners will cover project scoping for environmental planning, stakeholder consultation, field data collection, research, and report preparation. This is an intensive 32 hour course offered in a one-week time block in the spring semester.

IEP Fall

IEP 280   Environmental Chemistry

This introductory environmental chemistry course covers chemical theory and laboratory skills. Laboratory exercises address basic skills including laboratory safety, quantitative measurement, and use of common laboratory apparatus. Laboratory exercises are derived from standard methods for the examination of water and wastewater. The course goal is graduates will master basic chemical theory, use

environmental chemistry references, demonstrate safe chemistry laboratory practices, and perform standard methods for the determination of total, suspended and dissolved solids, pH, conductivity, dissolved oxygen, alkalinity and turbidity in water and wastewater samples.

<div align="right"><a>Back</div>

IEP 266   Applied Microbiology

This introductory applied environmental microbiology course covers basic microbiological theory and skills including safe lab practices; aseptic technique; preparation of media; isolation and growth of pure cultures; gram staining; microbial enumeration using pour plates, spread plates, membrane filtration and optical density; and identification of micro-organisms using biochemical tests.

<div align="right"><a>Back</div>

IEP 250   Environmental Planning Applications I

In this course, the first of a two-course sequence including IEP 251, small teams of students apply the knowledge and skills acquired previously and concurrently in other program courses to design and begin to implement a comprehensive, self-directed study to achieve a specified planning objective in a designated geographic area. Each team establishes study requirements, develops a complete study proposal and work plan, obtains and evaluates relevant existing information about the study area, collects and compiles field data needed to verify or update existing data or to describe additional environmental characteristics of the area, and prepares and submits a baseline data report.

<div align="right"><a>Back</div>

IEP 260   Systems Ecology

This course is an introduction to the science of ecology, building on concepts and information introduced in first year ENVR courses. Emphasis is placed on the basics of ecology, and will focus on the structure and function of various communities including alpine, subalpine, wetland, and riparian ecosystems. Labs will explore various methods of sampling, analyzing, and reporting on the physical site factors, habitat, vegetation and wildlife components of these communities.

<div align="right"><a>Back</div>

IEP 270   GIS Applications I

Geographic Information Systems (GIS) provides the capability to effectively analyze spatial data to assist in the decision-making process for those in government, industry and consulting. This course introduces the fundamental concepts and applications of GIS as relevant to environmental planning. Emphasis is placed on developing hands-on expertise with desktop GIS software (ArcView) for displaying and querying spatial data, manipulating tabular data, initiating queries, developing charts and producing map layouts.

<div align="right"><a>Back</div>

MATH 291 Resource Statistics II

This course is a continuation of MATH 190 (Resource Statistics). Topics include linear regression and correlation, inferential statistics, confidence intervals, hypothesis testing, goodness of fit and contingency tables.

<div align="right"><a>Back</div>

IEP 200   Field trip study

During the spring of the 4th semester, second-year students will participate in a field trip to study away from the Castlegar campus. The field trip provides an opportunity for students to see first-hand, current management practices, ecosystems and resource management issues in other regions of the province. Students will be actively involved in trip planning and will be presented with opportunities to develop communication skills, job finding skills and professionalism. This course is available only to students registered in the second year of the IEP Program. The course fee changes yearly dependent upon trip logistics.

IEP 251   Environmental Planning Applications II

In this course, knowledge and skills acquired in other program courses are again used by established, self-directed student teams to complete the planning studies initiated in IEP 250. This course focuses on analyses and aggregation of data collected in the previous semester, predictions of environmental effects of different development options, evaluations of the ecological and socioeconomic significance of those effects, a comparison of the options based on those evaluations, and the selection and presentation of a final development plan.

IEP 255   Hydrology II

This course is a more in-depth study of the effects of water on our environment. Practical examples are presented for examination, data collection, analyses, and interpretation in several areas including: snowpack, limnology, groundwater, surface runoff and flooding, small hydropower and hydraulic modeling.

IEP 281   Air and Water Pollution Chemistry

This course continues the study of environmental chemistry with studies of water quality, water and wastewater treatment. The course explores properties of water and introduces the use of colorimetry and atomic absorption spectrophotometry (AAS). Labs cover a benthic invertebrate study, toxicity testing, coagulant dosing, testing water for chlorine residual, and the quantitative determination of a metal in water samples using both a colorimetric method and AAS. In addition to water analysis, data analysis and data presentation using a spreadsheet is emphasized. This course also continues the study of environmental chemistry with studies of air quality, exploring such topics as air quality and methods for the collection and analysis of gases, particles and biological matter in air samples. Air stability, mass balance and stack dispersion modeling are introduced. A project to use lichens to assess air quality is included. Throughout the course, laboratory safety and lab skills acquired in year one are reinforced.

IEP 271   GIS Applications II

This course explores advanced analysis techniques in Geographic Information Systems (GIS) relevant to environmental planning issues. Students build upon prior expertise with GIS software to examine applications related to terrain and suitability modeling. Designed as a project-based course, students apply their skills to real-world project management by completing the steps required to take a GIS project from initial proposal to final map production and report generation.

IEP 290   Environmental Sustainability (New Course)

This course will cover subject areas in environmental sustainability. Learners will engage in gaining knowledge about Aboriginal Peoples; beginning to understand the role of Aboriginal Peoples in environmental management; treaty process and major landmark decisions in Canada regarding Aboriginal Peoples. As well, common topics will include applications of environmental management systems, environmental economics, water conservation and management, renewable energy systems, and climate change concepts.

IEP 280   Applied Research Project (New Course)

This course is a guided independent study of an environmental management topic suitable to the field of study. Learners are required to prepare a project proposal and data collection schedule in consultation with a faculty advisor. Research techniques using library and online resources are required as well as accurate data collection and synthesis. This course culminates with the submission of a technical report to current industry standards and presentation of the research results at the annual spring conference held late in the spring semester.

MATH 140   Calculus I for Social Sciences

An introductory course in calculus designed to provide students majoring in business, the life sciences or the social sciences with the necessary mathematical background for further study in these areas. The course includes functions, limits, the derivative and its application, anti-differentiation and the indefinite integral, elementary differential equations and some applications.