

## **Salish Kootenai College Final Report 2011-2012**

### **National Partnership for Environmental Technology Education (PETE), Tribal College Planning and/or Improvement Technical Assistance Grant**

Salish Kootenai College (SKC) was founded on the premise that the culture and life ways of the Confederated Salish and Kootenai Tribe (CSKT) should provide the foundation for successful post-secondary learning. Throughout SKC's history, this goal has given life to many successful ventures aimed at educating both Tribal and non-Tribal students. Among these successes is an ever-expanding science curriculum. This expansion has allowed SKC to offer the breadth and depth of science, technology, engineering and mathematics (STEM) course that provide a well rounded understanding of the ever-changing and interdisciplinary science fields in the 21st century. The skills required by are graduates to enter into the workforce or continue into graduate education also require an extensive background and experience using the tools and technology in use among current environmental science industries. The current grant opportunity offered significant contributions to enhancing the tool set and technology holdings at SKC.

Many of the STEM course offerings at Salish Kootenai College are interdisciplinary, offering crosscutting educational learning objectives that span multi-disciplinary science fields. The Natural Resources Department offers many unique courses that support the science curricula, and while specificity is required in upper level course, many first, second and third year courses are required and/or offered as electives to many of the other science programs at SKC.

Funds from this grant opportunity were used to enhance laboratory and field activities for courses that span multi-disciplinary science fields in SKC's Natural Resources Department. The purchases, while specific to certain courses, were selected to meet crosscutting uses while allowing for maximum use and benefit for our environmentally related degree programs.

The following narratives are the primary courses benefiting from this grant opportunity. This brief snapshot of elective and general education course provide a quick summary of the skill sets emphasized and required of our graduates. While many courses are offered as elective and elective emphasis courses some span across the science programs at SKC.

**Physical Geology and Lab (GEOL 101/ GEOL 102).** This course offers students an introduction to topics such as plate tectonics, mountain building, rock and mineral identification, earthquakes and volcanoes, glaciers, hydrology, weathering and erosion, geological dating techniques, and mineral and fossil fuel resources. The relationship between geology and tribal cultures will also be explored. Included is a lab section that provides practical exercises designed to complement the lecture. Field trips will introduce students to local geological features such as glacial erosion and deposition, extinct volcanoes, billion year old sedimentary rocks, geologic structures, landslides, stream features, and mineral deposits.

This course and its students are currently benefiting from the purchase of the Infiltration Rings and the ASTM Standard D3385-09 Methods. This method of testing is useful for field measurement of the infiltration rate of soils. Infiltration rates have applications in the field of liquid waste disposal, evaluation of potential septic tank disposal fields, leaching studies and drainage efficiencies. They are also helpful in determining irrigation requirements, water

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spreading or recharge, canal leakage and reservoir leakage testing and studies. Infiltration Rings are useful in industries like geology, geotechnical, engineering, hydrology, forestry, environmental testing, hydro geological, runoff studies, rain gardens, wetland mitigation, permeability testing, sanitation contractors, project planning, Professional Engineers (P.E.) and EPA requirements.

**Water Resources (ENVS 115)** provides students with an introduction to a critical natural resource upon which all life depends. Topics include the hydrologic cycle, water quality and quantity, ground water - surface water interaction, surface and groundwater flow, pollution sources and transport, water storage and supply, water law, Indian water rights, tribal views of the resource, and water management issues. Field trips will provide hands-on experience with real world issues.

This course and its students are currently benefitting from the HydroLab Quanta Factory Maintenance and Circulator replacement. The HydroLab Quanta is used for basic water quality parameter spot measurements (Temperature, Dissolved Oxygen, Conductivity, pH, ORP (Redox), Depth, and Turbidity), the Quanta offers Hydrolab's superior sensor technology in a complete, cost optimized system package that includes an easy-to-use, handheld display. These units were previously acquired by SKC and are long overdue for factory maintenance and calibration. Hydrolab multiprobe instruments are utilized throughout many state and tribal program for measuring the water quality of both ambient and effluent waters.

**Principles of Ecology & Lab (BIOS 260/ BIOS 261)** introduces students to basic principles with emphasis on ecosystems, energetic and population dynamics. Students learn to apply theoretical concepts to practical problems. The lab section combines field and laboratory experience with ecological measurement and investigations of ecological problems.

This course offering and its students are benefitting from the purchase of the Canon EOS Rebel T3i Digital Camera, 18MP, 18-55mm Kit. The Canon EOS digital camera is used for documenting scientific images during field and laboratory activities. The presence of high quality digital technology generates the potential for exploration of scientific concepts and environmental phenomenon, through the captured images in the environment, students have the opportunity to examine snapshots of environmental processes for further study, field reporting or public presentations.

**Introduction to Soil Science (ENVS 319/ENVS 320)** offers students the opportunity to survey the identification of soil types, development of soils, soil characteristics, and the effects of people on soils. Students will analyze the texture and structure of soils, as well as their chemical composition, water content, mineral makeup, and classification. The lab section provides students with active learning opportunities to apply the theory and methods studied in Introduction to Soil Science. Included are laboratory and field exploration of soil science applications.

This new course offering and its students are benefitting from the purchase of the LaMotte Turf Lab Kit and the Hydrometer Analysis Equipment and the ASTM D 422 Standard Test Method for Particle-Size Analysis of Soils. This method is applied to obtain an accurate determination of the particle size distribution of the smallest fractions contained in a soil sample. A widely used classification system is the soil triangle of basic soil textural classes.

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This naming system is commonly used by the U.S. Department of Agriculture and the U.S. Soil Conservation Service. This system relies on the relative percentages of three particle size categories including sand, silt, and clay. The Turf Lab Kit is specially designed for reliable, efficient measurements of nitrogen, phosphorus, potassium, iron, calcium, magnesium and soil texture (clay/silt/sand fractions). These parameters offer standard applications that provide potential examination of a host of soil chemistry concepts including cation exchange capacity and soil moisture capacity.