UNIVERSIDAD JUÁREZ DEL ESTADO DE DURANGO

FACULTY OF FORESTRY SCIENCES

Forestry Sciences Engineering

Learning Unit Modules

Focused in Integral Professional Competences

I. GENERAL LEARNING UNIT

1. Identification	2. Code	3. Semester	4. Training area
Environmental Services	TOP44-TOP47	7TH-8TH	Terminal

5. Mode					
Compulsory	X	**Elective**			
Classroom		**Non-Attendance**		**Mixed**	
Laboratory		**Field practices**		**Guided tours**	

6. Class shedule (hours per week)				
Theory	**Practice**	**Independent study**	**Total hours**	**Credits**
2	2	2	6	6

7. Person responsible for the Unit Learning
Juan Carlos Herrera Cárdenas

II. DATA SPECIFIC LEARNING UNIT

8. Objectives

Learning of Environmental Services unit is optional and is located within the line course of forest management of the educational program of engineer in forestry. It implements programs of timber-yielding and not timber-yielding forest handling, guaranteeing the use sustainable of the forest resources in fidelity to the current regulation.

Development of skills to understand and analyse the economic and ecological evaluation of natural ecosystems and the development of environmental service projects.

- Access to a general overview of the economic and ecological valuation of natural resources.
- Understand and conceptualize the various types of environmental services.
- Application of the methodology for the carbon calculation in the rural properties, cultural services and regulation

9. Presentation.

Learning of Environmental Services unit It is very important within the educational program of forestry engineer, Because it allows the students to understand the ecological processes of the natural ecosystems, and the benefits of ecological and economic type provided to humanity.

These services are, the quality of the air, the water quality, control and maintenance of the biogeochemical cycles.

10. Professional competences to develop in students.			
Knowledge	Skills	Attitudes	Values
• Trees and bushes constituve structures and applying an efficient use of their parts for human benefit. • Complex ecosystem that provides environmental and economical benefits for society. • Forest use techniques that carry a sustainable management of forest resource.	• Knowing and handling the constitutive structures of trees and bushes, and promoting an efficient use of their parts for human benefit. • Understanding the ecosystem as a complex that provides environmental and economical benefits for society. • Promote the interaction between society and forest resources for proposing viable solutions for the benefit of both.	• Interest in preserving nature • Collaboration and participation in team works • Participating in multidisciplinary scientific and technical teams aimed to the solution of problems that the forest sector has.	• Respect • Honesty • Responsibility

11. Course topics

UNIT I. The earth and the universe
UNIT II. The man and the nature
UNIT III. The natural resources
UNIT IV. The environmental services: concepts and applications.
UNIT V. Environmental Services of ecosystems.
UNIT VI. Economic evaluation and ecological of the natural resources.
UNIT VII. Provisioning Services
UNIT VIII. Regulation Services
UNIT IX. Support services
UNIT X. Cultural services

UNIT XI. Institutional development, political and legal for the payment and administration of environmental services

12. Evaluation criteria
Formative evaluation 30% Summative evaluation…..30% Self assessment 10% Co-evaluation 10% Evaluation hetero……..20%
Acreditation Performing activities 40% Exams 20% Homeworks 20% Analysis scientifics articles 20%
13. Information sources
Basic

CAPRA, F. (1994) ."El Nuevo Paradigma Ecológico" Nueva Conciencia No.22

DAJOZ, R. (1979). *Tratado de Ecología*. Mundi – Prensa, Madrid.

ENKERLIN, E.C, GARZ R.A; VOGEL, E. (1997). *Ciencia Ambiental y Desarrollo Sostenible*. Thompson Editores. México 1997.

GALANO, C.(2005). La Crisis Ambiental, Crisis de la Humanidad. La Cultura y las Ciencias: Ciencia Ergo Sum: Vol. 12 Num. 003. Universidad Autónoma del Estado de México

HERRERA C, J.C. (2013).- El Valor Económico y Ecológico de los Ecosistemas Naturales. Facultad de Ciencias Forestales UJED. Antología.

HERRERRA C, J.C. (2014).- Glosario de Términos Ambientales. Facultad de Ciencias Forestales UJED. Antología.

LOPEZ, V.M. (2006) *Sustentabilidad y Desarrollo Sustentable*. Origen, Precisiones Conceptuales y Metodología Operativa. Instituto Politécnico Nacional.

LOPEZ, V.M. (2006) *Sustentabilidad y Desarrollo Sustentable*. Origen, Precisiones Conceptuales y Metodología Operativa. Instituto Politécnico Nacional.

ODUM, E. ;GARY, W. (2006) Fundamentos de Ecología. Thompson Editores. S.A. de C.V.

OWEN. O. (1977).Conservación de Recursos Naturales. Editorial Pax. México.

SEMARNAT (2012).- *Criterios Técnicos Para la Ejecución de los Proyectos: Trámite a las Solicitudes de Cambio de Ubicación de las Áreas Apoyadas en el Concepto de Servicios Ambientales. Ejercicios Fiscales con Apoyo Vigentes.*

SMITH, L.;SMITH, M. (2001). *Ecología*. Pearson Educación S.A. Madrid, España.

TYLER M.J. (2002). *Ciencia Ambiental*. Preservemos la Tierra. Quinta Edición Thompson Editores, México.

Complementary

Collección Informative Bulletin. Con-Ciencia Ambiental. Edition 1-43

http.//www.semarnat.gob.*mx/informaciónambiental*