

UNIVERSIDAD AUTÓNOMA DE BAJA CALIFORNIA

COORDINACIÓN DE FORMACIÓN BÁSICA
COORDINACIÓN DE FORMACIÓN PROFESIONAL Y VINCULACIÓN UNIVERSITARIA
PROGRAMA DE UNIDAD DE APRENDIZAJE

I. DATOS DE IDENTIFICACIÓN

1. Unidad Académica: Facultad de Ciencias

2. Programa Educativo: Licenciatura en Biología, Licenciatura en Física, Licenciatura en Matemáticas Aplicadas, Licenciatura en Ciencias Computacionales

3. Plan de Estudios: 2017-2

4. Nombre de la Unidad de Aprendizaje: Introduction to Renewable Energy

5. Clave: 23882

6. HC: 03 **HL:** 00 **HT:** 00 **HPC:** 00 **HCL:** 00 **HE:** 03 **CR:** 06

7. Etapa de Formación a la que Pertenece: Terminal

8. Carácter de la Unidad de Aprendizaje: Optativa

9. Requisitos para Cursar la Unidad de Aprendizaje: Ninguno

Equipo de diseño de PUA

René Delgado Rendón

Felipe Noh Pat

Eric Efrén Villanueva Vega

Firma

Vo.Bo. Subdirector

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Firma

Fecha: 05 de abril de 2016

II. PROPÓSITO DE LA UNIDAD DE APRENDIZAJE

The learning unit Introduction to Renewable Energy is part of the educational program in Renewable Energy Engineering. This course is to support the learning units; Solar Energy, Wind Energy, Hydropower. The overall purpose of the course is to provide basic knowledge about the different kind of energy sources and the technology to use the renewable sources, applied in some opportunity areas.

III. COMPETENCIA DE LA UNIDAD DE APRENDIZAJE

Analyze and study the habits and ways of using different renewable energy sources and non-renewable, and identify areas of application, utilization and identification of technologies dedicated to the use of Renewable energies, objectively, critical attitude and responsibility.

IV. EVIDENCIA(S) DE DESEMPEÑO

Presentations will be an individual and team work, homework and written examinations will be requested, and the assistance will be considered too

V. DESARROLLO POR UNIDADES

UNIDAD I. Introduction to Renewable energy.

Competencia:

The understanding of the use and utilization of renewable energies through the time, the understanding of terms and definitions related with renewable energies. Also develop a broad view of the diversity of renewable and non-renewable sources and their use in the world, showing analytical attitude, objectivity and responsibility.

Contenido:**Duración: 9 horas**

- 1.1 History of Renewable Energies.
- 1.2 Definitions and terms.
- 1.3 Types of energy sources; conventional and non-conventional.
- 1.4 Renewable energy's broad view.

UNIDAD II. Renewable Energy Sources.

Competencia:

Understand the basic nature of the different sources of renewable energy, consider the utilization methods and logical criteria to consider the right use of the different technologies and renewable energy sources, always fostered a collaborative and respectful environment.

Contenido:

Duración: 18 horas

- 2.1 Solar energy.
- 2.2 Wind energy.
- 2.3 Hydro energy.
- 2.4 Geothermal energy.
- 2.5 Ocean energy.
- 2.6 Hydrogen and biomass.

UNIDAD III. Renewable Energy Technologies.

Competencia:

Analyze the characteristics of the different technologies for utilization of different renewable energy sources, and the analysis of their principles of operation and functioning, identify the characteristic of it's components in each case and the advantages and disadvantages of each technology, with compromise, interest and curiosity

Contenido:**Duración: 9 horas**

- 3.1 According to the source of energy.
- 3.2 Operation principle and main components.
- 3.3 Advantages and disadvantages of each technology.

UNIDAD IV. Methods and ways to use Renewable Energies.

Competencia:

Discuss alternatives and methods to use the energy alternatives combined for specific applications, considering the type of energy resource, application and functionality criteria, using logic and responsibility and conscientious attitude.

Contenido:

Duración: 12 horas

- 4.1 Electric generation.
- 4.2 Co generation; renewables and conventional systems.
- 4.3 Residential applications.
- 4.4 Industrial applications.
- 4.5 Other alternatives to use renewables.

VII. MÉTODO DE TRABAJO

Material and content presentation by the teacher such as fundamental concepts, after that is recommended the development of practical exercises on the blackboard with the participation of students, also group participation, finally homework exercises are recommended for individual and team work.

When new concepts are handled in class, it is recommended that before the end of this, start a round table or workshops where students perform a feedback of the class by describing the concepts and application of the topics.

VIII. CRITERIOS DE EVALUACIÓN

Criterios de evaluación

	Evaluation	Criteria	Percentage of final mark
Examinations			20%
Final Project			20%
Coursework			20%
Final Examination			40%

To be exempt of term examination students must obtain an 80% overall mark and must have at least a pass mark in all subjects. Final examination consists in students presenting all subjects appropriately corrected.

IX. BIBLIOGRAFÍA

Básica

- Boyle, Godfrey, ed. 2012. Renewable Energy: Power for a Sustainable Future. 3rd ed. Oxford: Oxford University Press in association with the Open University.
- Edenhofer, Ottmar, ed. 2012. Renewable Energy Sources and Climate Change Mitigation: Special Report of the Intergovernmental Panel On Climate Change. New York: Cambridge University Press.
- Nelson, Vaughn, and Kenneth Starcher. 2016. Introduction to Renewable Energy. second ed. Energy and the Environment. Boca Raton: CRC Press, Taylor & Francis Group.
- Tester, Jefferson W. ©2012. Sustainable Energy: Choosing Among Options. second ed. Cambridge, MA: MIT Press.

Complementaria

- Buchla, David, Thomas E. Kissell, and Thomas L. Floyd. 2015. Renewable Energy Systems. Upper Saddle River, New Jersey: Pearson Education, Inc.
- Clarke, Alexander. 2016. Rethinking the Environmental Impacts of Renewable Energy: Mitigation and Management. Abingdon, Oxon: Routledge.
- Sørensen, Bent. ©2011. Renewable Energy: Physics, Engineering, Environmental Impacts, Economics and Planning. 4th ed. Burlington, MA: Academic Press.
- Zobaa, Ahmed F., and Ramesh C. Bansal. ©2011. Handbook of Renewable Energy Technology. Singapore: World Scientific.

X. PERFIL DEL DOCENTE

Biologist, Physicist, Mathematic