A) COURSE

Course Id:	Course
5694	Statics

Class Hours per Week	Lab hours per week	Complementary practices	Credits	Total hour course
3	2	3	8	80 hours

B) GENERAL COURSE INFORMATION:

	EE (IEA)	ME (IM)	MME (IMA)	EME (IME)	MTE (IMT)
Level:	II	II	II	II	II
Course Type (Required/Elective)	Elective	Elective	Elective	Elective	Elective
Prerequisite Course:	Physics A (0061)	Physics A (0061)	Physics A (0061)	Physics A (0061)	Physics A (0061)
CACEI Classification:	CB	CB	CB	CB	CB

C) COURSE OBJECTIVE

At the end of the course, the student will be capable of:
Describe, calculate and analyze the conditions of equilibrium of a structure subjected to external loads and determine the solution in solid bodies for the obtaining of forces.

D) TOPICS (CONTENTS AND METHODOLOGY)

1.- Introduction		3 hours
Specific Objective:	**Objective 1:** Understanding of fundamental mechanical basis and system´s units.	
1.1 Mechanic´s principles, what is all about? 1.2 Concepts and fundamental principles 1.3 Sistems and conversion units Methods to solve problems		
Readings and other resources	Mecánica vectorial para ingenieros- estática, Beer y Johnston, McGraw Hill. Seely, F; Ensign, N, Mecánica analítica para ingenieros, Uteha, México. *Ingeniería Mecánica/Mecánica Vectorial para Ingenieros, Estática, R.C. Hibbeler, Pearson*.	
Teaching methods	Inductive method: going from general to particular knowledge. Group based learning to cope with basic theoretical knowledge.	
Learning activities	Lab practicing to apply concepts taught during class. It is mandatory to present task reports	

2.- Equilibrium of a particle		**16 hours**
Specific Objective::	**Objective 2:** Determine the effect that cause the particles to forces acting on them. Both spatial and coplanar systems.	
2.1 Forces on particles. Free body diagram for particles. 2.2 Force systems 2.3 Force components 2.4 Resutant force of a system 2.5 A particle in equilibrium Newton`s First Law		
Readings and others resources	Mecánica vectorial para ingenieros- estática, Beer y Johnston, McGraw Hill. Seely, F; Ensign, N, Mecánica analítica para ingenieros, Uteha, México. *Ingeniería Mecánica/Mecánica Vectorial para Ingenieros, Estática, R.C. Hibbeler, Pearson*.	
Teaching methods	Inductive method: going from general to particular knowledge. Group based learning to cope with basic theoretical knowledge.	
Learning activities	Lab practicing to apply concepts taught during class. It is mandatory to present task reports	

3.-Rigid Body. Equivalent force systems		**10 hours**
Specific Objective:	**Objective 3:** Effect of forces on rigid bodies.	
3.1 Internal and External Forces 3.2 Transmisibility Principle 3.3 Equivalent Forces 3.4 Moment of a Force. 3.5 Rectangular Components of a Moment 3.6 Moment with respect of an Axis Equivalent Force Pairs		
Readings and others resources	Mecánica vectorial para ingenieros- estática, Beer y Johnston, McGraw Hill. Seely, F; Ensign, N, Mecánica analítica para ingenieros, Uteha, México. *Ingeniería Mecánica/Mecánica Vectorial para Ingenieros, Estática, R.C. Hibbeler, Pearson*.	
Teaching methods	Inductive method: going from general to particular knowledge. Group based learning to cope with basic theoretical knowledge.	
Learning activities	Lab practicing to apply concepts taught during class. It is mandatory to present task reports	

4.- Rigid Body Equilibrium		**12 hours**
Specific Objective::	**Objective 4:** To establish and analyze the equilibrium conditions for rigid bodies.	
4.1 Free Body Diagram 4.2 Support Types of and their Reactions (2D and 3D) 4.3 Statically Determines Reactions (2D and 3D) Equilibrium of a Rigid Body (2D and 3D)		

Readings and others resources	Mecánica vectorial para ingenieros- estática, Beer y Johnston, McGraw Hill. Seely, F; Ensign, N, Mecánica analítica para ingenieros, Uteha, México. *Ingeniería Mecánica/Mecánica Vectorial para Ingenieros, Estática, R.C. Hibbeler, Pearson*.
Teaching methods	Inductive method: going from general to particular knowledge. Group based learning to cope with basic theoretical knowledge.
Learning activities	Lab practicing to apply concepts taught during class. It is mandatory to present task reports

5.- Distributed Forces. Centroid and gravity centers. First and Second Order Moments.	**16 hours**
Specific Objective:	**Objective 5:** Determine centroids and moments of inertia for simples and compound areas.
5.1 Center of Gravity of a two dimension body. 5.2 Centroid of Areas, Lines and Volumes. 5.3 Moment of First Order. 5.4 Moment of Inertia of Areas. Polar Moment of Inertia.	
Readings and others resources	Mecánica vectorial para ingenieros- estática, Beer y Johnston, McGraw Hill. Seely, F; Ensign, N, Mecánica analítica para ingenieros, Uteha, México. *Ingeniería Mecánica/Mecánica Vectorial para Ingenieros, Estática, R.C. Hibbeler, Pearson*.
Teaching methods	Inductive method: going from general to particular knowledge. Group based learning to cope with basic theoretical knowledge.
Learning activities	Lab practicing to apply concepts taught during class. It is mandatory to present task reports.

6.- Structure Analysis	**20 hours**
Specific Objective:	**Objective 6:** To establish and analyze the equilibrium conditions for diverse kind of structures and forces acting on such structures, in order to make a design proposal
6.1 Frames 6.2 Armatures 6.3 Armature Analysis: 1.1 Maxwell Graphic Method 2.1 Nodal Method 3.1 Section Method 6.4 Beams 6.5 Shearing Force 6.6 Flex Momento 6.7 Extreme Values of Moment 6.8 Cables Cable selection	
Readings and others resources	Mecánica vectorial para ingenieros- estática, Beer y Johnston, McGraw Hill. Seely, F; Ensign, N, Mecánica analítica para ingenieros, Uteha, México. *Ingeniería Mecánica/Mecánica Vectorial para Ingenieros, Estática, R.C. Hibbeler, Pearson*.
Teaching methods	Inductive method: going from general to particular knowledge. Group based learning to cope with basic theoretical knowledge.

Learning activities	Lab practicing to apply concepts taught during class. It is mandatory to present task reports

7.- Friction		**3 hours**
Specific Objective:	**Objective 7:** Calculate, analyze and find the meaning of friction effect on solids.	
7.1 Static friction coefficient Friction angle		
Readings and others resources	Mecánica vectorial para ingenieros- estática, Beer y Johnston, McGraw Hill. Seely, F; Ensign, N, Mecánica analítica para ingenieros, Uteha, México. *Ingeniería Mecánica/Mecánica Vectorial para Ingenieros, Estática, R.C. Hibbeler, Pearson*.	
Teaching methods	Inductive method: going from general to particular knowledge. Group based learning to cope with basic theoretical knowledge.	
Learning activities	Lab practicing to apply concepts taught during class. It is mandatory to present task reports	

E) TEACHING AND LEARNING METHODOLOGIES

a) Professor Lecture.
b) Paper Readings.
c) Use of software to prove mathematics modeling.
d) Homework to investigate important matters.
e) Case study strategy

F) EVALUATION CRITERIA:

Evaluation:	Periodicity	Suggested Ponderability to Evaluate	Evaluation:
1er. Partial Evaluation	20 Session	**25 % Ponderability** Partial Evaluation: Exam 80%, Extra work during class hour 10%, Participating in class hour 10%.	1er. Partial Evaluation
2da. Partial Evaluation	40 Session	**25 % Ponderability** Partial Evaluation: Exam 80%, Extra work during class hour 10%, Participating in class hour 10%.	2da. Partial Evaluation
3er. Partial Evaluation	60 Session	**25 % Ponderability** Partial Evaluation: Exam 80%, Extra work during class hour 10%, Participating in class hour 10%.	3er. Partial Evaluation
4ta. Partial Evaluation	80 Session	**25 % Ponderability** Partial Evaluation: Exam 80%, Extra work during class hour 10%, Participating in class hour 10%.	4ta. Partial Evaluation
Ordinary Final Evaluation		Partial Evaluation Average	Ordinary Final Evaluation

Extraordinary Exam	17th week of the semester	100% Exam	Extraordinary Exam
Title Exam	According Scholar Secretariat	100% Exam	Title Exam
Regularization Exam	According Scholar Secretariat	100% Exam	Regularization Exam

G) BIBLIOGRAPHY AND INFORMATIC RESOURCES

Basic Text Book

Mecánica vectorial para ingenieros- dinámica
Beer y Johnston
McGraw Hill
9a. edición 2010

Mecánica analítica para ingenieros
Seely, F; Ensign, N
Uteha, México
Mecánica para ingenieros TOMO II
Grupo editorial iberoamericana. México
1992

Complementary

DINÁMICA: Ingeniería Mecánica
R.C. Hibbeler
Prentice Hall/ Pearson.
10ª. Edición 2004

Internet Sites:

Moodle Platform
Sociedad Americana de Ingenieros Mecánicos: ASME
https://www.asme.org

Data Bases:

About materials properties.
http://www.matweb.com
Fundamental knowledge on Mechanic Engineering materials, unit conversion factors, mechanical design, equations and formulae, fabricating processes, solid mechanics, fluids and mathematics. http://www.efunda.com/home.cfm

Simulate Software:

MD Solid Simulator