



A) COURSE

Course Id:	Course
5545	AUTOMOTIVE ENGINEERING

Class Hours per Week	Lab hours per week	Complementary practices	Credits	Total hour course
5	0	5	10	80 hours total

B) GENERAL COURSE INFORMATION:

	EE (IEA)	ME (IM)	MME (IMA)	EME (IME)	MTE (IMT)
Level:		10	6	6	6
Course Type (Required/Elective)		Elective	Elective (mobility)	Elective (mobility)	Elective (mobility)
Prerequisite Course:		It requires that have approved 315 credits	It requires that have approved 315 credits	It requires that have approved 315 credits	It requires that have approved 315 credits
CACEI Classification:		AE	AE	AE	AE

C) COURSE OBJECTIVE

At the end of the course, the student will be capable of:

The student will analyze and develop the skills to understand the different types of vehicles and their components, and analyze the vehicle in travel conditions and thus establish conditions for accident prevention.

C) TOPICS (CONTENTS AND METHODOLOGY)

1. Basic concepts.		16 Hours
Specific Objective:	Basics of vehicle construction is presented to students.	
	1.1 types of vehicles' construction 1.2 forces opposed the travel direction 1.2.1 resistance to running 1.2.2 aerodynamic resistance 1.2.3 resistance to lateral forces 1.2.4 slope resistance 1.2.5 resistance to acceleration 1.2.6 total resistance 1.2.7 vehicle power	
Readings and other resources	Course notes, complementary bibliography, internet pages, videos, product catalogues and power point presentations.	



Teaching Methodologies	Presentation and explanation of topics in class, PPT presentations, student interactions.
Learning Activities	Taking notes during class, problem solving, homework realization, and project development.

2. Components of a vehicle.	16 Hours
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Specific Objective:	The student will identify and analyze the vehicle's component.
	<ul style="list-style-type: none"> 2.1 power transmitters elements. <ul style="list-style-type: none"> 2.1.1 clutch 2.1.2 transmission of changes 2.1.3 transmission shafts, universal joints. 2.1.4 shaft drive 2.1.5 power transmission losses 2.2 brakes <ul style="list-style-type: none"> 2.2.1 basic concepts 2.2.2 types of construction 2.2.3 performance of the brakes 2.3 suspension and steering wheel <ul style="list-style-type: none"> 2.3.1 suspension of wheels and springs 2.3.2 direction 2.4 wheels and tires <ul style="list-style-type: none"> 2.4.1 wheels 2.4.2 tires 2.5 body y course topics <ul style="list-style-type: none"> 2.5.1 fundamental layout concept 2.5.2 blank body 2.5.3 equipment 2.5.4 conditioning of climate 2.5.5 acoustics or noise control
Readings and other resources	Course notes, complementary bibliography, internet pages, videos, product catalogues and power point presentations.
Teaching Methodologies	Presentation and explanation of topics in class, PPT presentations, student interactions.
Learning Activities	Taking notes during class, problem solving, homework realization, and project development.

3. Suspension and ride comfort.	16 Hours
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Specific Objective:	The student will identify and analyze the vehicle's component.
	<ul style="list-style-type: none"> 3.1 track or roadway 3.2 models of vehicle <ul style="list-style-type: none"> 3.2.1 nonlinearities 3.2.2 vehicle of two and more axles 3.2.3 comfort travel
Readings and other resources	Course notes, complementary bibliography, internet pages, videos, product catalogues and power point presentations.
Teaching Methodologies	Presentation and explanation of topics in class, PPT presentations, student interactions.



Learning Activities	Taking notes during class, problem solving, homework realization, and project development.
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4. Directional behavior.		16 Hours
Specific Objective:	The student will analyze the factors involved in the direction of a vehicle.	
4.1 vehicle with a controlled system 4.1.1 stationary behavior address 4.1.2 transient behavior 4.2 driver and vehicle requirement 4.3 cornering width		
Readings and other resources	Course notes, complementary bibliography, internet pages, videos, product catalogues and power point presentations.	
Teaching Methodologies	Presentation and explanation of topics in class, PPT presentations, student interactions.	
Learning Activities	Taking notes during class, problem solving, homework realization, and project development.	

5. Mechanics of accidents.		16 Hours
Specific Objective:	The student will know the precautions that must have to avoid accidents in cars.	
5.1 basic concepts 5.2 precautions to reduce the risk of injuries		
Readings and other resources	Course notes, complementary bibliography, internet pages, videos, product catalogues and power point presentations.	
Teaching Methodologies	Presentation and explanation of topics in class, PPT presentations, student interactions.	
Learning Activities	Taking notes during class, problem solving, homework realization, and project development.	

D) TEACHING AND LEARNING METHODOLOGIES

- a) Presentation and explanation of topics in class.
- b) Power Point presentations (PPT)
- c) Analysis and synthesis of concepts.
- d) Problem solving.
- e) Homework and discussion.
- f) Team work.
- g) Course project.



F) EVALUATION CRITERIA:

Evaluation:	Schedule	Suggested Form of Evaluation and weighting	Topics
1 st partial evaluation.	Session 20	20 % Total Evaluation Partial evaluation: Exam 90% , Assignments 10%	1
2 nd partial evaluation.	Session 40	20 % Total Evaluation Partial evaluation: Exam 90% , Assignments 10%	2
3 rd partial evaluation.	Session 60	20 % Total Evaluation Partial evaluation: Exam 90% , Assignments 10%	3
4 th partial evaluation.	Session 80	20 % Total Evaluation Partial evaluation: Exam 90% , Assignments 10%	4
5 th partial evaluation.	Session 100	20 % Total Evaluation Partial evaluation: Exam 90% , Assignments 10%	5
Ordinary final evaluation		100% (Average value of the partial evaluations)	
Second chance final exam	Week 17 of the semester in progress	100% Exam	100% topics
Third chance final exam	According to Secretary school setting	100% Exam	100% topics
Regularization Exam	According to Secretary school setting	100% Exam	100% topics

G) BIBLIOGRAPHY AND ELECTRONIC RESOURCES

Main Books

Buschmann, h.; koe*ler, p.: handbuch für den kraftfahrzeugenieur (manual para el ingeniero automotriz). 8a edición. stuttgart: deutsche verlagsanstalt. 1973

Complementary Books

Plataforma de Moodle

Sociedad Americana de Ingenieros Mecánicos:

<https://www.asme.org>

Internet Links

Encuentra las bases fundamentales de la ingeniería mecánica en este sitio web, clasificados por temas como materiales, conversión de unidades, diseño, fórmulas, procesos, mecánica de los sólidos, fluidos, y matemáticas.

<http://www.efunda.com/home.cfm>