GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Diploma Engineering				Branch	Automobile Engineering		
Semester	VI				Version	1.0.0.0		
Effective from Academic Year		2020-21			Effective for the batch Admitted in			July 2018
Subject code	1AU2608		Subject Name		Automobile Design			
Teaching scheme					Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50

Pre-requisites:
Students must have basic knowledge of Engineering Drawing such as 3D views, Sketching, Auto-CAD.

Course Learning Outcomes:
The course content should be taught and implemented with an aim to develop different skills leading to the achievement of the following competencies and course learning outcomes: CO1. To understand Context Related Problems. CO2. To understand Customer's Explicit needs and Latent needs. CO 3. To be able to draft an Automobile vehicle body. CO 4. To be able to sketch/ live draw using models and objects. CO 5. To integrate design and ergonomics.

Course Content				
Name of UNIT	Unit Content	Unit Learning Outcomes	Marks	Hrs
UNIT – 1 History of Transportation and Automobile Design	1a. Brief history on the evolution of present day vehicles- Personal and public mobility system. 1b. Innovations in sources of energy and their impact on design. 1c. Impact of standardization and mass manufacture. 1d. Technology and style relationship. 1e. Retro styling movement. 1f. Automobile terminologies and configurations.	1.1 History and Evolution of Present day of Automobile. 1.2 Styling and Branding.	6	5
UNIT – 2 Computer Graphics	2a. Use of surface modelling tools to create shapes, volumes and surfaces. 2b. Use of parametric modelling tools. 2c. Creation of complex 3d virtual models complete with surface qualities and rendering. 2d. Creation of digital files for rapid prototyping / computer aided milling.	2.1 3D Computer Graphics for Shape Design and Modelling.	12	8

UNIT – 3 **Studies in 3D Form**	3a. Theory of colours and perception. 3b. Form language for vehicles. 3c. Form abstraction, form expression, Form transition-use of metaphors. 3d. Treatment of large surfaces and volumes. 3e. Interpolation and blending of forms. 3f. Advanced radii manipulation: Filleting, Chamfers, varying fillets and radii. 3g. Tangential and non tangential curves.	3.1 Exploration of Form, Styles and Semantics.	14	10
UNIT – 4 **Vehicle Design Process**	4a. Automobile design process. 4b. Design systems in auto industry. 4c. Project work: Starting from a given 'preliminary sketch' of a vehicle concept and taking it through the process of form development using appropriate technologies and iterating at various stages of design to finish with rapid/ CNC model. 4d. Sketching for style enhancement, selection of concept, 2D rendering using CAD tools (adobe Photoshop). 4e. 3D Modelling. Checking surfaces qualities, Rendering of 3D model. 4f. Conversion from surface to parametric model (CAID to CAD). 4g. 2D drawing generation / sectional views / wire diagrams.	4.1 Exposure to vehicle Design Process and systems in Automobile Industry.	16	12
UNIT – 5 **Vehicle Ergonomics**	5a. Introduction to human body. 5b. Anthropometrics and its application to vehicle ergonomics and cockpit design. 5c. Driver comfort – seating, visibility, man-machine system. 5d. Psychological factors – stress, attention. 5e. Passenger comfort - Ingress and egress, spaciousness, ventilation, temperature control, dust and fume prevention and vibration. 5f. Interior features and conveniences 5g. Safety features in vehicles.	5.1 Ergonomics of Interior Space. 5.2 Driver and Passenger Comfort and Amenities.	12	10
		Total	60	45

List of Practical		
Sr. No.	**Unit No.**	**Name of Practical**
1	1	Presentation of Automobile Terminologies.
2	1	Presentation on Sources of Energy used in Automobiles.
3	2	Representation of form concepts and ideas, rendering of automobile elements.
4	3	Applying various software tools such as Chamfering, Fillets and curves.
5	4	Sketching of a vehicle.
6	4	Using plaster/ clay for understanding the form and refining, study models
7	5	Presentation on Passenger Comfort.
8	5	Presentation on Safety Features in Vehicles.

List of Text Books			
No	Title of Books	Authors	Publication
1	Pioneers, Engineers & Scoundrels: The dawn of the automobile	Beverly Rae Kimes	Society of Automotive Engineers
2	Automobile ergonomics	B. Peacock, Waldemar Karwowski	CRC Press
3	Car Design Yearbook 1: The Definitive Guide to New Concept and Production Cars Worldwide	Stephen Newbury	Publisher: Merrell 2002

List of Reference Books			
No	Title of Reference Books	Authors	Publication
1	Visual effects in a digital world	Karen E. Goulekas	Morgan Kaufmann
2	Principles of Two-Dimensional Design	Wucius Wong	Wiley
3	General motors styling 1927-1958: Genesis of the World's Largest Studios	Tracy Powell	Powell House Publishing

Link of Learning Web Resource	
1	https://www.youtube.com/watch?v=m3NqWgkNO5U
2	https://www.youtube.com/watch?v=hDeTPdUNw0Y
3	http://www.improve2011.it/Full_Paper/132.pdf
4	https://www.youtube.com/watch?v=-VzTn7WUb5U
5	https://all3dp.com/2/surface-modeling-cad-simply-explained/
6	https://www.spatial.com/resources/glossary/what-is-surface-modeling
7	https://www.youtube.com/watch?v=qfMqTFNtGeU
8	https://www.youtube.com/watch?v=rXDuAeQS1gI
9	https://thesourcecad.com/how-to-make-2d-from-3d-drawing-in-autocad-using-flatshot/
10	https://www.torquenews.com/1080/how-car-design-works-start-finish
11	https://www.youtube.com/watch?v=KaenNpHaFFg
12	http://drivingergonomics.lboro.ac.uk/downloads/vehicle%20ergonomics%20and%20best%20practice%20guide.pdf
13	https://auto.howstuffworks.com/under-the-hood/trends-innovations/car-ergonomics.htm
14	https://www.driverside.com/auto-library/5_ways_to_improve_visibility_while_driving-929
15	https://coverhound.com/insurance-learning-center/new-technology-is-improving-drivers-visibility