
VALUE ADDED COURSE

Swarnnim Institute of Technology

Course Code: VACAAT

Year: 2020-2021

Semester:- Odd

Subject: Advanced Automotive Technologies

Program:	Bachelor of Engineering	Branch:	Mechanical & Automobile Engineering
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Hours:- 36 hrs.

Objective:- Highlight the importance of environmental impact and life cycle assessment in automotive design.

Detail Syllabus

Sr.	Content	Total Hrs
1	Electric and Hybrid Vehicles: Fundamentals of electric vehicle (EV) technology, Types of hybrid electric vehicles (HEVs), Battery management systems and charging infrastructure, Power electronics and electric motor design	09
2	Autonomous Driving Systems: Introduction to autonomous vehicles (AVs), Sensors and perception systems (LiDAR, radar, cameras), Machine learning and artificial intelligence in AVs, Vehicle control and path planning algorithms, Ethical and regulatory considerations	07
3	Advanced Driver Assistance Systems (ADAS): Overview of ADAS technologies (lane-keeping assist, adaptive cruise control, etc.), Sensor fusion and data integration, Human-machine interface (HMI) design for ADAS, Testing and validation of ADAS.	09
4	Alternative Fuels and Powertrains: Hydrogen fuel cells and fuel cell vehicles (FCVs), Biofuels and synthetic fuels, Advanced internal combustion engines (ICE), Energy storage and fuel efficiency technologies	07
5	Connected Vehicles and IoT: Internet of Things (IoT) applications in automotive, Telematics and vehicle diagnostics, Over-the-air (OTA) updates and remote vehicle monitoring, Data analytics and big data in connected vehicles	02

6	Sustainable Automotive Technologies: Life cycle assessment (LCA) of automotive products, Recycling and disposal of automotive components, Sustainable materials and light weighting, Environmental impact and regulations	02
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Reference Books:

Sr. No.	Author/s	Name of the Book	Publisher
1	Iqbal Husain:	Electric and Hybrid Vehicles: Design Fundamentals	CRC Press, 2003
2	Mehrdad Ehsani, Yimin Gao, Ali Emadi:	Modern Electric, Hybrid Electric, and Fuel Cell Vehicles: Fundamentals, Theory, and Design	CRC Press, 2018

Online Resources:

1. <https://saemobilus.sae.org/courses/hybrid-electric-vehicle-engineering-academy-acad06>
2. <https://iisc.talentsprint.com/mobility-engineering/main.html#specialCorporateEnrolment>

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