



## National University of Sciences and Technology

### Course Description

Course Title	Course Code	Credit Hours
Advanced Driver Assistance Systems (ADAS) with AI	ME-917	3 – 0

#### Textbooks:

- "Advanced Driver Assistance Systems: Principles, Technology, and Applications" by Marco Dozza

#### Reference Books:

- "Introduction to Autonomous Vehicles" by Yang Zheng and Junmin Wang
- "Autonomous Driving: Technical, Legal and Social Aspects" by Markus Maurer, J. Christian Gerdes, Barbara Lenz, and Hermann Winner

#### Course Objective:

- This course provides an in-depth understanding of Advanced Driver Assistance Systems (ADAS) and the role of Artificial Intelligence (AI) in enhancing the performance of such systems

#### Course Outline:

- Introduction to Advanced Driver Assistance Systems (ADAS)
- ADAS Fundamentals
- ADAS Technologies and Systems
- ADAS Implementation Challenges
- ADAS Market Trends and Future Directions
- AI Technologies for ADAS
- AI Fundamentals for ADAS
- Machine Learning and Deep Learning Techniques
- Computer Vision Techniques for ADAS
- Sensor Fusion Techniques for ADAS
- ADAS Design and Implementation
- ADAS Requirements and Specifications
- ADAS Architecture and Components
- ADAS Testing and Validation
- ADAS Performance Evaluation
- ADAS Applications and Use Cases
- Lane Departure Warning Systems
- Forward Collision Warning and Avoidance Systems
- Adaptive Cruise Control Systems
- Parking Assistance Systems
- Other ADAS Systems and Applications
- Future Directions and Emerging Technologies
- AI-Based Autonomous Driving Systems
- Cooperative ADAS Systems
- Multi-modal ADAS Systems
- Ethical and Legal Implications of ADAS and AI Technologies.

#### ASSESSMENTS

Description	Percentage Weightage (%)
Assignments	05-10%
Quizzes	10-15%
Mid Semester Exams	30-40%
End Semester Exam	40-50%