

Vehicle Safety

B.E. Sem. VIII [AUTO]

(Elective – II)

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3Hrs.	100
Practical & Oral	–	–
Oral Exam	–	25
Term Work	–	25

SYLLABUS

1. Basic Concepts Of Vehicle Safety

Importance of Vehicle Safety, Global priority for vehicle safety, Underlying principles, Fail-safe, Alternative design, Redundancy and derating, Fault tolerance, Safety factors, Positive guidance, Warnings and instructions, Universal design, Survivability and injury reduction, System engineering, Digital models and Man testing

2. Study And Design for structural & pedestrian safety

preliminary consideration in vehicle structural design, structural design for occupant protection, passenger car body structure for energy absorption, design of school bus for safety, Design of front end system for pedestrian safety, comprehensive approach to increased pedestrian safety in pedestrian to car accidents

3. Study and design for impacts

Side impact : Side impact barrier – Development & evolution, IIHS side impact barrier – development & crash test, side impact motor vehicle structural characteristics from crash tests

Compatibility : Development of test procedures & performance criteria to improve compatibility in car frontal collisions improvement in car to car compatibility

Rear impact : Whiplash injury, kinematics of human spine in rear impact and the bio-fidelity of current dummies

Design of dummies & simulation of impacts

4. Occupant Injury Prevention: Biokinetics

Introduction, Active and Passive safety, Seat belts and passenger restraint systems, Seats and Seat frames, Door locking and retention devices, Safety glasses, Child protection devices, Warning and signaling devices, Anti theft devices, design of visual displays & controls, Heads –up displays

5. Steering Column, Braking Systems And Crash Testing

Collapsible and impact protection devices, Design of running gear for safety, Load sensing and pressure regulating devices, Split or dual braking systems, Antilock braking systems, Traction control devices

Crash Testing : Human testing, Crashworthiness, Compliance testing, Component testing, Proving ground testing, In-field testing

6. Future Technology

Collision avoidance radar warning system, Low tyre pressure warning system, Advanced driver information system, Safety Regulations of EEC, FMVSS AND CMVR, In car safety & personal security , needs of female drivers & passengers

References Books :

1. Automotive vehicle safety (*George Peters and Barbara Peters*)
2. International conference on Vehicle Safety 2002
3. Understanding Automotive electronics (*William Ribbens*).
4. Central Motor vehicle Rules (CMVR).
5. SAE Handbook
6. Vehicle safety by Limpert
7. EEC Regulations
8. SAE special publications
9. Body Design (*Polowski*)

