ANNA UNIVERSITY, CHENNAI
UNIVERSITY DEPARTMENTS
B.E. COMPUTER SCIENCE AND ENGINEERING
RUSA
REGULATIONS – 2018
OPEN ELECTIVES TO BE OFFERED IN THE MIT CAMPUS

Sl. No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	EL	CREDITS
DIVISION OF APPLIED SCIENCES AND HUMANITIES									
1.	HS6392	Critical Thinking Skills	OE	3	2	0	0	3	3
DEPARTMENT OF AEROSPACE ENGINEERING									
2.	AE6391	Theory of Flight	OE	3	3	0	0	-	3
DEPARTMENT OF AUTOMOBILE ENGINEERING									
3.	AU6391	Fundamentals of Automobile Engineering	OE	3	3	0	0	-	3

HS6392 CRITICAL THINKING SKILLS	L	T	P	EL	TOTAL	CREDITS
	2	0	0	3	3	

MODULE I :	L	T	P	EL
	6	-	-	3

What is critical thinking – 21st century skills – collaboration and teamwork discussions – focus on - creativity and Imagination – problem solving (oral and written communication activities)- importance of thinking critically- multiple intelligences

SUGGESTED ACTIVITIES:

- Interpretation of texts from different perspectives (samples to be provided)
- Small Group Work (analysis of the inherent messages in the text)
- Short essays (e.g. Expressing views on the current educational system)

SUGGESTED EVALUATION METHODS:

- Essay Writing (e.g. benefits of collaboration and team work)
- Quizzes

MODULE II :	L	T	P	EL
	6	-	-	3

Fostering critical thinking- statement of facts and opinions – inference of assumptions & evidences - logical reasoning – deductive & inductive reasoning – changing perspectives – (choice of appropriate words& expressions, perceived logical linkages, avoidance of irrelevance)

SUGGESTED ACTIVITIES :

- Think – pair – share activities (with sample reading texts)
- Relevant talks (listening comprehension exercises)

SUGGESTED EVALUATION METHODS:

- Writing short factual essays
- Reading comprehension (focus on diction)

MODULE III :	L	T	P	EL
	6	-	-	3

Claims, issues & arguments – (Content analysis)– Ambiguities in argument – jargon, emotional barriers and their influence on reasoning - Semantic disagreements (Vocabulary specific to the linguistic acts of disagreeing & disputing) – Inconsistencies in an argument - Discourse rules in group discussion

SUGGESTED ACTIVITIES:

- Group Discussion Activities (selected topics)
- Debates (uncontroversial topics)
- (Taboos, hostile audience, physical & technical disabilities, differences in perspective & view point)

SUGGESTED EVALUATION METHODS:

- Group Discussion
- Debate
- Case Study Presentation

MODULE IV :	L	T	P	EL
	6	-	-	3

Detecting Fallacies (Hasty Generalizations, Circular argument, Red herring) – Types of Fallacies – Making inferences – Drawing conclusions – Conceptualization of ideas - Analysis & synthesis of ideas - Evaluating information - Scientific reasoning (thinking about many dimensions at the same time)

SUGGESTED ACTIVITIES:

- Fallacy check exercises (with suitable reading texts)
- Jigsaw reading

SUGGESTED EVALUATION METHODS:

- Mini presentation on given topics
- Assignment (Analytical Essay writing)
- Quizzes

MODULE V :	**L**	**T**	**P**	**EL**
	6	**-**	**-**	**3**

Internet & critical thinking (using the internet as a resource) – Collaborative problem solving – Creative critical thinking (analyzing, synthesizing, reflecting, evaluating) - Media & critical thinking

SUGGESTED ACTIVITIES:

- Flipped Class room (Performance Appraisal)
- Discussion threads (on an online forum)
- Critical review writing (Stress on the positive side)

SUGGESTED EVALUATION METHODS:

- Quizzes
- Mini projects (SGW)

REFERENCE BOOKS:

1. Bradley H Dowden, “Logical Reasoning”, California State University, Sacramanto, 2017.
2. Howard Gardner, “Multiple Intelligences: New Horizons in Theory and Practice”, Ingram Publisher Services US, United States, 2006.
3. K.S.Walters, K. S. (Ed.), “Re-thinking Reason: New Perspectives on Critical Thinking”, Albany: State University of New York Press, Albany, 1994.
4. A.L.Costa, “Developing minds: A Resource Book for Teaching Thinking”, 3rd Edition, Association for Supervision and Curriculum Development Alexandria, 2001.
5. R.Paul, “Critical Thinking: What every student needs to survive in a rapidly changing world”, Foundation for Critical Thinking, Dillon Beach, CA, 1992.
6. Diane F Halpern, “Thinking Critically about Critical Thinking”, Lawrence Erlbaum Associates, Mahwaj,NJ, 1996.

AE6391 THEORY OF FLIGHT L T P C
3 0 0 3

OBJECTIVE:

To introduce the concepts of flying, International standard atmosphere, structural aspects of airplanes, brief description of systems of instruments used in airplanes and power plants used**.**

UNIT I HISTORY OF FLIGHT 7

Balloon flight-ornithopers-Early Airplanes by Wright Brothers - biplanes and monoplanes - Developments in aerodynamics, materials, structures and propulsion over the years.

UNIT II TYPES AND CONTROL OF AIRPLANES 10

Different types of flight vehicles, classifications-Components of an airplane and their functions-Conventional control, powered control- Basic instruments for flying-Typical systems for control actuation.

UNIT III FUNDAMENTALS OF AERODYNAMICS 10

Physical Properties and structures of the Atmosphere - Temperature, pressure and altitude relationships - Newton's Law of Motion applied to Aeronautics-Evolution of lift, drag and moment - Aerofoils -.airframe components and their functions – Performance and introduction to stability and control.

UNIT IV FUNDAMENTALS OF AIRBREATHING PROPULSION 9

Basic ideas about piston, turboprop and jet engines – use of propeller and jets for thrust production – Aircraft performance estimation using engine performance parameters

UNIT V FUNDAMENTALS OF SPACE FLIGHT 9

Principle of operation of rocket - types of rocket and typical applications - Exploration into space-equation for space flight – two dimensional rocket motion - rocket trajectories – multistaging – rocket performance

TOTAL :45 PERIODS

OUTCOMES:

On completion of the course, the students will understand the basic concepts of airplane aerodynamics, control of airplanes, air-breathing propulsion and rocket flight.

TEXT BOOKS

1. Anderson, J.D., Introduction to Flight, McGraw-Hill; 8th edition, 2015.
2. Stephen.A. Brandt, Introduction to aeronautics: A design perspective, 2nd edition, AIAA Education Series, 2004.

REFERENCES

1. Kermode, A.C. Flight without Formulae, Pearson Education; Eleven edition, 2011.

AU6391 FUNDAMENTALS OF AUTOMOBILE ENGINEERING L T P C
3 0 0 3

OBJECTIVE:

To understand the basics and working principles of various systems of an automobile.

UNIT I VEHICLE STRUCTURE AND ENGINE 9

History of Automobiles – types of automobile – components of chassis – frame – body - Automotive Engines- types- components of engines-comparison of Two and four stroke engines – construction and working principle –cooling and lubrication system. Merits and demerits of SI and CI engine. Application of SI and CI engine. Emission norms.

UNIT II TRANSMISSION SYSTEM 9

Need for transmission system – types of transmission – clutch – types – working principle and construction- gear box – types – working and construction – Automatic transmission – fluid coupling, torque converter. propeller shaft- slip joint – universal joint – final drive – rear axle.

UNIT III STEERING, BRAKE AND SUSPENSION SYSTEMS 9

Steering system requirements and functions-Steering geometry- Ackermann and Davis steering principle- Wheel alignment parameters – wheels – types of wheels- tyres – types of tyres – steering system components – power steering. Braking system – need – classification – mechanical and hydraulic brake system. Suspension system- types – front suspension – wisebone independent front suspension – rear suspension – leaf spring suspension. Dampers.

UNIT IV AUTOMOTIVE ELECTRICAL AND ELECTRONICS 9

Batteries- types – working and construction – lead acid battery. Starter motor. Charging system-alternator – control unit. Spark plug – ignition system. Vehicle lighting- head lamp. Automotive sensors and transducers- types – application.

UNIT V SAFETY AND EMERGING TRENDS IN AUTOMOTIVE VEHICLES 9

Active and passive safety – safety devices –safety regulations - seat belt- air bag- traction control-collision warning and avoidance system. Climate control. Keyless entry. Cruise control. Drive by wire. Automotive infotronics. Driverless cars.

TOTAL: 45 PERIODS

OUTCOME:

The students able to identify the different components in an automobile and have clear understanding on working principle of different systems of an automobile.

TEXT BOOK:

1. K K Ramalingam, “Fundamentals of Automobile Engineering”, Scitech publications (India) Pvt. Ltd.

REFERENCES:

1. Ganesan V. “Internal Combustion Engines”, Third Edition, Tata McGraw-Hill, 2007.
2. Newton , Steeds and Garet, “Motor Vehicles”, Butterworth Publishers,1989.
3. William H Crouse, “Automotive Mechanics ”,The McGraw-Hill companies,2007
4. K K Ramalingam, “Automobile Engineering theory and practice”, second edition, Scitech publications (India) Pvt.Ltd.