

DEPARTMENT OF AERONAUTICAL ENGINEERING

COURSE COVERAGE SUMMARY

FOR (R20A2110) AIRCRAFT STRUCTURES

III BTECH – I SEMESTER (2022-2023)



MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Sponsored by CMR Educational Society)

(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade – ISO 9001:2008 Certified)

Maisammaguda, Dhulapally (Post Via Hakimpet), Secunderabad – 500100

(R20A2110) AIRCRAFT STRUCTURES
COURSE COVERAGE SUMMARY

Unit	Title of the unit	Topics of the unit	Name of the Text Book	Chapter No.	Page No
I	Theory of Thin Plates And Thin Walled Beams	Analysis of thin rectangular plates subject to bending, distributed transverse load, combined bending and twisting, Wagner beam analysis.	"Aircraft Structures for Engineering students" by THG Megson	A3, A4	217-248 & 294-320
II	Unsymmetrical Bending	Unsymmetrical bending-resolution of bending moments - direct stress distribution, shear flow in open section beams, shear centre, Torsion of thin walled closed section- Bredth - Batho shear flow.	"Aircraft Structures for Engineering students" by THG Megson	B3	451-544
III	Structural Idealization And Loading Discontinuities In Thin Walled Beams	Structural idealization of different aircraft components, shear stress distribution at a built in end of a closed section beam.	"Aircraft Structures for Engineering students" by THG Megson	B3	846-886
IV	Stress Analysis of Aircraft Components	Wing and Fuselage - Direct stress and shear flow distribution -Wing spars, tapered wing and fuselage frames	"Aircraft Structures for Engineering students" by THG Megson Publications	B4	581-648`
V	Energy Methods	Strain Energy due to axial, bending and torsional loadings. Deflection in beams- Castigliano's theorem	"Strength of materials" by R.S.Khurmi.	37	463-489 & 490-508

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COURSE COVERAGE SUMMARY
FOR
FUNDAMENTALS OF CYBER SECURITY

III BTECH – I SEMESTER
(2022-2023)

FUNDAMENTALS OF CYBER SECURITY

COURSE COVERAGE SUMMARY(R20A6214)

S.NO. Unit/ Topic NO	Sub Topic Names	Name of the text book	Chapter No.	Page No.
UNIT -I Introduction to Cyber Security	Cyber Security Concepts, layers of security, Vulnerability, threat, Harmful acts	CYBER SECURITY ESSENTIALS BY JAMES GRAHAM RICHARD HOWARD RYAN OLSON	I	1-70
	Governance – Challenges and Constraints, Computer Criminals, CIA Triad			
	Assets and Threat, motive of attackers, active attacks, passive attacks, Software attacks			
	hardware attacks, Spectrum of attacks, Taxonomy of various attacks, IP spoofing			
	of defense, Security Models, risk management, Cyber Threats-Cyber Warfare			
	Cyber Crime, Cyber terrorism, Cyber Espionage, etc.			
	Cyber Security Policy			
UNIT II Cyber Offenses	How Criminals Plan Them:	Introduction to Cyber Security BY Chwan- Hwa(john) Wu,J.David Irwin.CRC Press T&F Group	I	3-70
	Introduction, How Criminals plan the Attacks, Social Engineering, Cyber stalking			
	Cyber cafe and Cybercrimes, Botnets			
	Fuel for Cybercrime, Attack Vector, Cloud Computing.			
UNIT III Cybercrime: Mobile and Wireless Devices	Introduction	CYBER SECURITY ESSENTIALS BY JAMES GRAHAM RICHARD HOWARD RYAN OLSON	II	75-116
	Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile			
	Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices			
	Authentication service Security, Attacks on Mobile/Cell Phones			
	Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile			
	Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile			
	Organizational Security Policies an Measures in Mobile Computing Era, Laptops.			
UNIT IV	Introduction, Proxy Servers and Anonymizers, Phishing, Trojan	CYBER	III	119-

Types of Attacks and Cybercrime	Password Cracking, Keyloggers and Spywares, Virus and Worms,	SECURITY ESSENTIALS BY JAMES GRAHAM RICHARD HOWARD RYAN OLSON		191
	Horse and Backdoors, Steganography, DoS and DDoS attacks,			
	SQL Injection, Buffer Overflow			
UNIT V Cyber Security Organizational Policies, Risk and Chanllenges:	Organizational Implications., Security Risks and Perils for Organizations,.	CYBER SECURITY ESSENTIALS BY JAMES GRAHAM RICHARD HOWARD RYAN OLSON	V	267-301
	Introduction, Cost of Cybercrimes and IPR issues, Web threats for Organizations			
	Security and Privacy Implications, Social media marketing:			
	Social Computing and the associated challenges for Organizations			

COURSE COVERAGE SUMMARY

FOR

III B.TECH – I SEMESTER

(2022-2023)

**(R20A2131) AIRCRAFT COMPOSITE
MATERIALS**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF AERONAUTICAL ENGINEERING

III Year B. Tech, ANE - ISem

(R20A2131) AIRCRAFT COMPOSITE MATERIALS COURSE COVERAGE (PROFESSIONAL ELECTIVE – I)

TITLE OF THE UNIT	TOPICS OF THE UNIT	NAME OF THE TEXT BOOK	CHAPTER No.	PAGE No.
UNIT-I MECHANICAL BEHAVIOUROF ENGINEERING MATERIALS	Linear and non linear elastic properties – Yielding, strain hardening, fracture, Bauschinger's effect – Notch effect testing and flaw detection of materials and components – creep and fatigue – Comparative study of metals, ceramics, plastics and composites.	AIRCRAFT MATERIALS AND PROCESSES BY G.F TITTERTON	I II	1 TO 3 5 TO 21 53 TO 96
UNIT-II HEAT TREATMENT OF METALS AND ALLOYS	Light Metal Alloys: Aluminum and its alloys, high strength and high corrosion alloys. Titanium and its alloys: applications, Classification of steels alloys, effect of alloying elements, magnesium alloys and their properties, maraging steels: properties and applications. High Strength and Heat Resistant Alloys: Classification of heat resistant materials, iron, nickel and cobalt based alloys, refractory materials, silica based ceramics, properties of inconel, monel, nimonic and super alloys; application of heat resistant alloy in aerospace vehicles. Heat treatment of steel and its alloys. Case hardening, initial residual stresses and stress alleviation procedures, corrosion prevention	AIRCRAFT MATERIALS AND PROCESSES BY G.F TITTERTON	V XI XII XIII	43 TO 67 145 TO 184 185 TO 191 193 TO 232

	and protective treatments.			
UNIT-III INTRODUCTION TO COMPOSITE MATERIALS	Introduction, polymer matrix composites, metal matrix composites, ceramic matrix composites, carbon-carbon composites, fiber, reinforced composites and nature-made composites and applications. Reinforcements: Fibers Glass, Silica, Kevlar, carbon, boron, silicon carbide, and born carbide, fibres. Particulate composites, Polymer composites, Thermoplastics, Thermosetting	MECHANICS OF COMPOSITE MATERIALS BY AUTAR K. KAW	I	1 TO 51
UNIT-IV HYBRID COMPOSITES	Basic design concepts of sandwich construction - Materials used for sandwich construction. Failure modes of sandwich panels. Basic design of composite structure, Smart materials, Functionally Graded Materials (FGM) Selection criteria for Aerospace Materials: Properties of flight vehicle materials, importance of strength/ weight ratio of materials for aerospace vehicles structures, importance of temperature variations, factors affecting the selection of material for different parts of airplanes.	HYBRID POLYMER COMPOSITE MATERIALS APPLICATIONS BY VIJAY KUMAR TAKUR	II III	35 TO 96
UNIT-V APPLICATION AND TESTING	Classification of Aircraft Materials used for Aircraft Components-Application of Composite Materials- Super Alloys (Ni & Mg Alloys), Indigenes Alloys (Ti6AL4V, Si-Al-Cu). Emerging Trends in Aerospace Materials (Shape memory alloys). Latest techniques in testing and Flaw Detection of Material and Components by mechanical and NDT checks..	AIR TRANSPORTATION A MANAGEMENT PERSPECTIVE BY JOHN G. WENSVEEN	XII XIII	343 TO 369 373 TO 396

COURSE COVERAGE SUMMARY

FOR

III B.TECH – I SEMESTER

(2022-2023)

(R20A2111) Air Breathing Propulsion

(R20A2111) Air Breathing Propulsion**COURSE COVERAGE SUMMARY**

Unit	Title of the unit	Topic of the unit	Name of the book	Chapter No	Page No
1	FUNDAMENTALS OF PROPULSION:	Aircraft Engine Components-Performance Requirements, Thermodynamic Processes-Representation by T-s and p-v diagrams - Pressure ratios, Temperature ratios.	Mattingly, J.D., Elements of Gas Turbine Propulsion, McGraw-Hill, 1996, ISBN0-07-912196-9	1	7-25
		Energy transfer, losses; Polytropic and Stage Efficiencies; Engine Station Numbering, Thrust generation, Equation of Thrust for installed and uninstalled cases, Factors affecting thrust, Role of propulsion in aircraft performance.	Flack, R.D., Fundamentals of Jet Propulsion with applications, Cambridge University Press, 2005, ISBN0-521-81983-0	1	4-23
2	I ANATOMY OF JET ENGINE-I	INLETS: Locations, Types of inlets, operating principle, functions, geometry, operating conditions, flow field, capture area, flow distortion, drag, and diffuser losses and methods of mitigation, performance;	Flack, R.D., Fundamentals of Jet Propulsion with applications, Cambridge University Press, 2005, ISBN0-521-81983-0	3	73-98
		Numericals on inlets. NOZZLE: Function, Types, Engine Back-pressure control, Exhaust nozzle Area Ratio; Thrust Vectoring, Types; Thrust Reversal, Types of Thrust Reversal Systems; Nozzle Coefficients, Gross Thrust coefficient, Discharge Coefficient, Velocity coefficient, Angularity coefficient	Mattingly, J.D., Elements of Gas Turbine Propulsion, McGraw-Hill, 1996, ISBN0-07-912196-9	5	87-109
3	ANATOMY OF JET ENGINE-II.	COMPRESSOR & TURBINE: Types, construction, stage, cascade, blade geometry, velocity triangles, Euler equation, types of flow analysis, diffusion factor, stage loading, Performance Maps, Off-design Performance, Multi-spooling; Axial flow turbines, Velocity diagram analysis, no exit swirl condition, flow losses, causes tangential stresses,	Jack D Mattingly., William Heiser & David Pratt., Aircraft Engine Design	2	6-45

		repeating stages, Typical blade profiles, turbine performance maps, Blade cooling, materials, Similarities and differences with compressors; Numericals on turbo- machinery			
4	V ANATOMY OF JET ENGINE-III	BURNER: Essential considerations in Design of Burners; Primary Burners- types, components, schematic diagram, operation; airflow distribution,	Jack D Mattingly., William Heiser & David Pratt., Aircraft Engine Design	5	90-125
		Flame stability, Ignition and Engine starting; Factors effecting Combustion Chamber Performance; Flame tube Cooling; Fuel injection, Afterburners, flame stabilization, flame holders; fuels - composition and properties	Mattingly, J.D., Elements of Gas Turbine Propulsion, McGraw-Hill, 1996, ISBN0-07-912196-9	4	197-233
5	DESIGN OF GAS TURBINE ENGINE:	DESIGN OF GAS TURBINE ENGINE: Aircraft Mission Analysis, Engine Selection- Performance and Parametric Analysis, Sizing the Engine, Major Considerations in Engine Components Design. SYSTEM MATCHING AND ANALYSIS: Component Matching of Gas Turbine Engine, Gas Generator, Component Modelling, Equilibrium Points; Solution of Matching Problem, Dynamic and Transient Response, Matching of Engine and Aircraft.	Jack D Mattingly., William Heiser & David Pratt., Aircraft Engine Design	3	56-234