

SCHEME OF EXAMINATION
B. Tech. Robotics & Automation 1st Semester

CODE	COURSE	L	T	P	Credits
HSIC102 HSIC104	Economics for Engineers OR Business Studies	2	1	0	3
MAIC101	Differential Calculus and Differential Equations	3	1	0	4
PHIC101	Engineering Physics	2	1	2	4
MEIC101	Engineering Graphics	1	0	3	2
CSIC103	Problems Solving and Programming using C	3	0	2	4
CHIC101	Energy and Environmental Science	2	0	1	3
HSNC106-111	Any one subject from Group-II	2	0	0	2
SWNC101	NCC/Sports/Yoga	0	0	2	1*
SWNC102	NSS/Clubs/Technical Societies	0	0	2	1*
	Total				22

* Continuous Evaluation Model as per guidelines and the credit to be awarded at the end of 6th Semester based on Cumulative performance up to 6th Semester

GROUP - II	
CODE	COURSE
HSNC 106	Indian Knowledge Systems
HSNC 107	Teachings of Gita
HSNC 108	French Language Skills
HSNC 109	German Language Skills
HSNC 110	Japanese Language Skills
HSNC 111	Thought Lab and Practices

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SCHEME OF EXAMINATION
B. Tech. Robotics & Automation 2nd Semester

CODE	COURSE	L	T	P	Credits
HSIC101	Communication Skills in English	2	0	2	3
	OR				
HSIC103	Financial Education	2	1	0	3
MAIC102	Integral Calculus and Difference Equations	3	1	0	4
CSIC100	Digital System Design	4	0	0	4
MEIC102	Engineering Practice	1	0	3	2
CSIC104	Programming using Python	3	0	2	4
HSNC101-105, MANC101	Any one subject from Group-I	2	0	0	2
RAPC101	Engineering Mechanics	3	1	0	4
SWNC101	NCC/Sports/Yoga	0	0	2	1*
SWNC102	NSS/Clubs/Technical Societies	0	0	2	1*
	Total Credits				23

* Continuous Evaluation Model as per guidelines and the credit to be awarded at the end of 6th Semester

based on Cumulative performance up to 6th Semester

GROUP - I	
CODE	COURSE
HSNC 101	Human Values and Social Responsibility
HSNC 102	Sanskrit Language Skills
HSNC 103	Hindi Language Skills
HSNC 104	Telugu Language Skills
HSNC 105	Constitution of India
MANC 101	Vedic Mathematics

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B.Tech Robotics and Automation 2nd SEMESTER

RAPC101 ENGINEERING MECHANICS

Pre-requisite: Nil

L	T	P	Credits
3	1	0	4

Course Learning Objectives:

1. The primary objective of the course on engineering mechanics is to develop the understanding to predict the effects of force and motion while carrying out the creative design functions of engineering
2. To enable engineering students to analyze basic mechanics problems and apply vector based approach to solve them.

Course Content:

Unit-I

Statics: Introduction, Statics of Particles, Rigid Bodies: Equivalent Systems of Forces, Rigid Bodies: Equivalent Systems of Forces, Equilibrium of Rigid Bodies, Distributed Forces: Centroids and Centers of Gravity, Moment of Inertia, Analysis of Structures: Trusses, Frames and Machines; Frictional forces; Laws of Coulomb friction; Applications to Wedges and Screws [14]

Unit -II

Kinematics: Kinematics of Particles in Cartesian, Cylindrical and Path Co-ordinate systems, Kinematics of Rigid Bodies, Translation and Rotation, Relative Motion, Three-Dimensional Motion of a Particle Relative to Rotating Frame [7]

Unit-III

Dynamics: Newton's laws of motion for a system of Particles: Linear and Angular Momentums; Inertia tensor; Principal axes; Work Energy Principle; Impulse Momentum Principles; Dynamics of rigid bodies: The Inertia Tensor; Euler's Equations of Motion; Plane Motion of a Rigid Body; General Motion of a Rigid Body; Work-Energy and Impulse-Momentum Principle for Rigid Bodies, Application to impact [15]

Unit IV

Variational Mechanics: Method of Virtual Work; Method of Minimum Potential Energy for Conservative Systems [4]

Course outcomes:

Upon successful completion of the course, the student should be able to:

1. Use scalar and vector analytical techniques for analyzing forces in statically determinate structures
2. Apply fundamental concepts of kinematics of particles and rigid bodies to the analysis of simple and practical problems in mechanics

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3. Apply of Newton's laws, Euler's equations of motion, impulse momentum principle and work energy principle.
4. Apply method of virtual work to determine equilibrium position of a rigid body or a system of rigid bodies

REFERENCES:

1. "Vector Mechanics for Engineers: Statics and Dynamics (Eleventh Edition in SI Units)" by Beer, Johnston, Mazurek, Cornwell and Sanghi, McGraw Hill Education (India) Pvt. Ltd., 2018.
2. "Engineering Mechanics" by P C Dumir, S Sengupta and Srinivas V Veeravalli, University Press, 2020
3. "Engineering Mechanics: Statics and Dynamics", 8e, by J.L. Merium and L.G. Kraige, John Wiley and Sons (Asia) Pvt. Ltd. Singapore, 2002.
4. "Engineering Mechanics - Statics and Dynamics", 4e, by Irving H. Shames, Prentice Hall of India Pvt. Ltd. Eastern Economy Edition, 2001.

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