GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY: NELLORE

(AUTONOMOUS)

NELLORE–524317 (A.P) INDIA

B.TECH IN MECHANICAL ENGINEERING

(ACCREDITATED BY NBA)

COURSE STRUCTURE AND SYLLABI UNDER RG 22 REGULATIONS

GEETHANJALI INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
NELLORE – 524137 (A.P) INDIA

B.TECH Mechanical Engineering

Course Structure (RG22)

Semester 0

Induction Program: 3 weeks
(Common for All Branches of Engineering)

S.No	Course No	Course Name	Category	L-T-P-C
1		Physical Activities--Sports, Yoga and Meditation, Plantation	MC	0-0-6-0
2		Career Counseling	MC	2-0-2-0
3		Orientation to all branches—career options, tools, etc.	MC	3-0-0-0
4		Orientation on admitted Branch-corresponding labs, tools and platforms	EC	2-0-3-0
5		Proficiency Modules & Productivity Tools	ESC	2-1-2-0
6		Assessment on basic aptitude and mathematical skills	MC	2-0-3-0
7		Remedial Training in Foundation Courses	MC	2-1-2-0
8		Human Values & Professional Ethics	MC	3-0-0-0
9		Communication Skills—focus on Listening, Speaking, Reading, Writing skills	BSC	2-1-2-0
10		Concepts of Programming	ESC	2-0-2-0

GEETHANJALI INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
NELLORE – 524137 (A.P) INDIA

B.TECH Mechanical Engineering

Course Structure (RG22)

Semester - 1 (Theory-5, Lab-3)							
Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	C
1	BSC	22A0001T	Linear Algebra and Calculus	2	1	0	3
2	BSC	22A0007T	Engineering Chemistry	3	0	0	3
3	ESC	22A0518T	C-Programming & Data Structures	3	0	0	3
4	ESC	22A0203T	Basic Electrical & Electronics Engineering	3	0	0	3
5	ESC (Lab)	22A0304P	Engineering Workshop Lab	0	0	3	1.5
6	ESC (Lab)	22A0502P	IT Workshop Lab	0	0	3	1.5
7	BSC (Lab)	22A0012P	Engineering Chemistry Lab	0	0	3	1.5
8	ESC (Lab)	22A0519P	C-Programming & Data Structures Lab	0	0	3	1.5
9	ESC (Lab)	22A0204P	Basic Electrical & Electronics Engineering Lab	0	0	3	1.5
			Total credits				**19.5**

Category	Credits
Basic Science Course (BSC)	7.5
Engineering Science Course (ESC)	12
Total	19.5

GEETHANJALI INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
NELLORE – 524137 (A.P) INDIA

B.TECH Mechanical Engineering

Course Structure (RG22)

Semester - 2 (Theory-4, Lab-5)							
Sl. No.	Category	Course Code	Course Title	Hours per week			Credits
				L	T	P	C
1	BSC	22A0002T	Differential Equations and Vector Calculus	2	1	0	3
2	BSC	22A0004T	Engineering Physics	3	0	0	3
3	HSSC	22A0013T	Communicative English	3	0	0	3
4	ESC	22A0301T	Basics of Mechanical Engineering	3	0	0	3
5	ESC	22A0302T	Engineering Drawing	1	0	4	3
6	ESC (Lab)	22A0303P	Engineering Graphics Lab	0	0	3	1.5
7	HSSC(Lab)	22A0014P	Communicative English Lab	0	0	3	1.5
8	BSC (Lab)	22A0008P	Engineering Physics Lab	0	0	3	1.5
			Total credits				**19.5**

Category	Credits
Basic Science Courses	7.5
Humanities and Social Science Courses	4.5
Engineering Science Courses	7.5
Total	19.5

GEETHANJALI INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
NELLORE – 524137 (A.P) INDIA

==========

Mechanical Engineering
II B.TECH.

Semester-III (Theory–6, Lab–3, Skill Course-1, Mandatory Course-1)							
S.No.	Course Code	Course Name	Category	Hours per week			Credits
				L	T	P	
1.	22A0015T	Complex Variables, & Numerical methods	BSC	2	1	0	3
2.	22A0305T	Manufacturing Processes	PCC	3	0	0	3
3.	22A0307T	Material Science & Engineering	PCC	3	0	0	3
4.	22A0309T	Engineering Mechanics	PCC	2	1	0	3
5.	22A0310T	Thermodynamics	PCC	2	1	0	3
6.	22A0022T	Managerial Economics and Financial Analysis	HSSC	3	0	0	3
7.	22A0306P	Manufacturing Processes Lab	PCC	0	0	3	1.5
8.	22A0308P	Material Science and Engineering Lab	PCC	0	0	3	1.5
9.	22A0311P	Solid Modeling Lab	PCC	0	0	3	1.5
10.	22A0539P	**Skill oriented course** Java programming	SOC	1	0	2	2
11	22A0028M	**Mandatory Course–I** Environmental Science	MC	2	0	0	0
						Total	**24.5**

Distribution of Credits among the Category of Courses		
S.No	Category of Courses Introduced	Credits Assigned
1	Basic Science Courses (1T)	3
2	Professional Core Courses (4T+1L)	16.5
3	Humanities and Social Science Courses (1T)	3
4	Skill Oriented Course - 1 (T+P)	2
5	Mandatory Non Credit Course (1T)	0
Total Credits		24.5

GEETHANJALI INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
NELLORE – 524137 (A.P) INDIA

==========

Mechanical Engineering
II B.TECH.

Semester-IV (Theory–5, Lab–3,Skill course-1, Mandatory course-1)							
S.No.	Course Code	Course Name	Category	Hours per week			Credits
				L	T	P	
1.	22A0019T	Transforms and Probability distribution	BSC	2	1	0	3
2.	22A0312T	Applied Thermal Engineering	PCC	2	1	0	3
3.	22A0314T	Strength of Materials	PCC	2	1	0	3
4.	22A0316T	Fluid Mechanics and Hydraulic Machinery	PCC	2	1	0	3
5.	22A0021T	Universal Human Values	HSSC	3	0	0	3
6.	22A0315P	Strength of Materials Lab	PCC	0	0	3	1.5
7.	22A0317P	Fluid Mechanics and Hydraulic Machinery Lab	PCC	0	0	3	1.5
8	22A0313P	Applied Thermal Engineering Lab	PCC	0	0	3	1.5
9.	22A0517P	**Skill oriented course** Python Programming	SOC	1	0	2	2
10.	22A0029M	**Mandatory Non credit course–II** Constitution of India	MC	3	0	0	0
						Total	**21.5**
4 Weeks Community service Project is mandatory during Summer vacation							

Distribution of Credits among the Category of Courses		
S.No	Category of courses introduced	Credits Assigned
1	Basic Science Courses (1T)	3
2	Professional Core Courses (3T+3L)	13.5
3	Humanities and Social Science Courses (1T)	3
4	Skill Oriented Course – 1 (T+P)	2
5	Mandatory Non Credit Course (1T)	0
Total Credits		21.5

GEETHANJALI INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
NELLORE – 524137 (A.P) INDIA

==========

Mechanical Engineering
III B.TECH.

Semester-V (Theory–5, Lab–3, Mandatory Course-1)							
S.No	**Course Code**	**Course Name**	**Category**	**Hours per week**			**Credits**
				L	**T**	**P**	
1.	22A0318T	Kinematics of Machinery	PCC	2	1	0	3
2.	22A0319T	Machine Tools and Metrology	PCC	3	0	0	3
3.	22A0321T	CAD/CAM	PCC	3	0	0	3
4.	22A0323T	**Professional Elective Course -I**	PEC	3	0	0	3
	22A0323Ta	Automobile Engineering					
	22A0323Tb	Mechanical Vibrations					
	22A0323Tc	Automation In Manufacturing					
5.		**Open Elective Course -I**	OEC	3	0	0	3
	22A0149T	Building Materials					
	22A0430T	Principles of Communications					
	22A0214Ta	Power Electronics					
	22A0512T	Data Base Management System					
6.	22A0320P	Machine Tools and Metrology Lab	PCC	0	0	3	1.5
7.	22A0322P	CAD/CAM/CAE lab	PCC	0	0	3	1.5
8.	22A0029P	**Skill oriented course** Soft Skills	SOC	1	0	2	2
9.	22A00526T	**Mandatory Course** Design Thinking for Innovation	MC	2	0	0	0
10	22A0324	**Internship-I((**Evaluated the community service project completed at the end of second year)					1.5
						Total	**21.5**

Distribution of Credits among the Category of Courses		
S.No	Category of Courses Introduced	Credits Assigned
1	Professional Core Courses (3T+2L)	12
2	Professional Elective Courses (1T)	3
3	Humanities and Social Science Courses (1T)	3
4	Skill Oriented Course – 1 (T+P)	2
5	Mandatory Non Credit Course (1T)	0
6	Community Service Project completed in Second year	1.5
	Total Credits	21.5

GEETHANJALI INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
NELLORE – 524137 (A.P) INDIA

Mechanical Engineering
III B.TECH.

Semester-VI (Theory–6, Lab–1, Skill course-1, Mandatory course-1)							
S.No.	Course Code	Course Name	Category	Hours per week			Credits
				L	T	P	
1.	22A0325T	Dynamics of Machinery	PCC	2	1	0	3
2.	22A0326T	Design of Machine Elements	PCC	3	0	0	3
3.	22A0327T	Heat Transfer	PCC	2	1	0	3
4.	22A0329T	**Professional Elective Course-II**	PEC	3	0	0	3
	22A0329Ta	Renewable Energy Sources					
	22A0329Tb	Introduction to Composites					
	22A0329Tc	Measurements and Mechatronics					
5.		**Open Elective Course – II**	OEC	3	0	0	3
	22A0150T	Environmental Economics					
	22A0431T	Micro controller and applications					
	22A0213Ta	Control Systems Engineering					
	22A0528T	Introduction to Machine learning					
6.	22A0023T	Management science	HSSC	3	0	0	3
	22A0024T	Entrepreneurship & Innovation					
	22A0026T	Human Resource Management					
7.	22A0328P	Heat Transfer Lab	PCC	0	0	3	1.5
8.	22A0331P	**Skill Oriented course** 3D Printing practice	SOC	1	0	2	2
9.	22A0031T	**Mandatory Course** Intellectual Property Rights & Patents	MC	2	0	0	0
						Total	**21.5**
Industry Internship/Research Internship is mandatory during Summer vacation							

Distribution of Credits among the Category of Courses		
S.No	Category of Courses Introduced	Credits Assigned
1	Professional Core Courses (3T+1L)	10.5
2	Professional Elective Courses (1T)	3
3	Open Elective Course Courses (1T)	3
4	Humanities and Social Science Courses (1T)	3
5	Skill Oriented Course – 1 (T+P)	2
6	Mandatory Non Credit Course (1T)	0
Total Credits		21.5

GEETHANJALI INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
NELLORE – 524137 (A.P) INDIA

==========

Mechanical Engineering
IV B.TECH

Semester-VII (Theory–6, Skill Course–1)							
S.No.	**Course Code**	**Course Name**	**Category**	**Hours per week**			**Credits**
				L	**T**	**P**	
1.	22A0332T	**Professional Elective Course -III**	PEC	3	0	0	3
	22A0332Ta	Design of Heat Transfer Equipment					
	22A0332Tb	Tribology					
	22A0332Tc	Unconventional Machining Processes					
2.	22A0333T	**Professional Elective Course -IV**	PEC	3	0	0	3
	22A0333Ta	Refrigeration and Air-Conditioning					
	22A0333Tb	Introduction to Robotics					
	22A0333Tc	Finite Element Methods					
3.	22A0334T	**Professional Elective Course-V**	PEC	3	0	0	3
	22A0334Ta	Power Plant Engineering					
	22A0334Tb	Non-Destructive Evaluation					
	22A0334Tc	Fundamentals of Drone Technology					
4.		**Open Elective Course -III**	OEC	3	0	0	3
	22A0151T	Disaster Management					
	22A0241Ta	Smart Electric Grid					
	22A0433T	Industrial Electronics					
	22A0529T	Cloud Computing					
5.		**Open Elective Course -IV**	OEC	3	0	0	3
	22A0152T	Construction Management					
	22A0332Ta	Electric Vehicles					
	22A0432T	Basics of VLSI Design					
	22A0534Tb	Introduction to Cyber Security					
6.	22A0335T	Operations Research	PCC	2	1	0	3
7.	22A0336P	**Skill Advanced Course** Industrial Automation	SAC	1	0	2	2
8.	22A0337	**Internship-II**(Evaluated the Industry Internship completed at the end of Third year)					3
						Total	**23**

Distribution of Credits among the Category of Courses		
S.No	**Category of Courses Introduced**	**Credits Assigned**
1	Professional Core Courses (1T)	3
2	Professional Elective Courses (3T)	9
3	Open Elective Course Courses (2T)	6
4	Skill Advanced Course – 1 (T+P)	2
5	Summer Internship of completed in Third year	3
Total Credits		23

GEETHANJALI INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
NELLORE – 524137 (A.P) INDIA

==========

Mechanical Engineering
IV B.TECH

Semester-VIII						
S.No.	Course Code	Course Name	Hours per week			Credits
			L	T	P	
1	22A0338	Full Internship/Project work	0	0	24	12
					Total Credits	12

Distribution of Credits among the Category of Courses		
S.No	Category of Courses Introduced	Credits Assigned
1	Project Work	12
Total Credits		12
Overall Credits in the Program		**163**

COURSES OFFERED FOR HONOURS DEGREE IN MECHANICAL ENGINEERING

Note: 1. The Honours subjects are having a total of 20 additional credits.
2. The student should acquire four credits through MOOCs compulsory to award the Honour Degree.

S.No.	Course Code	Course Title	Contact Hours per week			Credits
			L	T	P	
1	22A03H01	Fracture Mechanics	3	1	0	4
2	22A03H02	Computational Fluid Dynamics	3	1	0	4
3	22A03H03	Analysis and Synthesis of Mechanisms	3	1	0	4
4	22A03H04	Applications of Optimization Techniques	3	1	0	4
5	22A03H05	**MOOC**				4

LIST OF MINOR COURSES OFFERED BY MECHANICAL ENGINEERING

S.No.	Course code	Minor Title	Hours per week			Credits
1.	22A03M01	Modern Manufacturing Methods	3	1	0	4
2.	22A03M02	Engineering Thermodynamics	3	1	0	4
3.	22A03M03	Material Science & Engineering	3	0	2	4
4.	22A03M04	Design of Machine Elements	3	1	0	4
5.	22A03M05	Additive Manufacturing	3	0	2	4
6.	22A03M06	Synthesis and characterization of Composites	3	1	0	4
7.	22A03M07	Mechatronics & MEMS	3	1	0	4
8.	22A03M08	Hybrid Vehicles	3	1	0	4