



RAGHU INSTITUTE OF TECHNOLOGY

AUTONOMOUS

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Accredited by NBA (ECE, MECH, CSE) & NAAC with 'A' Grade, Listed u/s 2(f) & 12(B) of UGC Act 1956.
Dakamarri, Bheemunipatnam Mandal, Visakhapatnam Dist. – 531 162, (A.P.)
Ph: +91-8922-248003, 248013
e-mail: principal@raghuinstech.com website:www.raghuinstech.com

DEPARTMENT OF MECHANICAL ENGINEERING

PROGRAM STRUCTURE

I SEMESTER

S.No.	Course Code	Name of the Course	Course Component	L	T	P	Credits
1	20MA1001	Calculus	BSC	3	0	0	3
2	20PH1001	Engineering Physics	BSC	3	0	0	3
3	20HS1001	English for communication	HSMC	3	0	0	3
4	20ES1010	Engineering Graphics	ESC	1	0	4	3
5	20ES1004	C-Programming	ESC	3	0	0	3
6	20ES1102	Engineering Work Shop	ESC	0	0	3	1.5
7	20PH1101	Engineering Physics Lab	BSC	0	0	3	1.5
8	20ES1104	C-Programming Lab	ESC	0	0	3	1.5
Total				13	0	13	19.5

Category	CREDITS
Basic Science course	7.5
Engineering Science Courses	9.0
Humanities and social science	3.0
TOTAL CREDITS	19.5



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II SEMESTER

S.No.	Course Code	Name of the Course	Course Component	L	T	P	Credits
1	20MA2002	Linear algebra and vector calculus	BSC	3	0	0	3
2	20CH2001	Engineering Chemistry	BSC	3	0	0	3
3	20ES2011	Engineering Mechanics	ESC	3	0	0	3
4	20ES2012	Engineering Thermodynamics	ESC	3	0	0	3
5	20ES2001	Essential Electrical & Electronics Engineering	ESC	1	0	4	3
6	20ES2101	Essential Electrical & Electronics Engineering Lab	ESC	0	0	3	1.5
7	20CH2101	Engineering Chemistry Lab	BSC	0	0	3	1.5
8	20HS2101	English Language Communication Skills Lab	HSMC	0	0	3	1.5
9	20MC2501	Environmental Science	MC	2	0	0	0
Total				15	0	13	19.5

Category	CREDITS
Basic Science course	9.0
Engineering Science Courses	10.5
TOTAL CREDITS	19.5



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III SEMESTER

S.No.	Course Code	Name of the Course	Course Component	L	T	P	Credits
1	20MA3005	Numerical Techniques & Partial Differential equations	BSC	3	0	0	3
2	20ME3001	Metallurgy & Material Science	PCC	3	0	0	3
3	20ME3002	Mechanics of Solids	PCC	3	0	0	3
4	20ME3003	Production Technology	PCC	3	0	0	3
5	20HS3002	Managerial Economics & Financial Accountancy	HSMC	3	0	0	3
6	20ME3101	Mechanics of Solids & Metallurgy lab	PCC	0	0	3	1.5
7	20ME3102	Computer Aided Engineering Drawing Lab	PCC	0	0	3	1.5
8	20ME3103	Production Technology Lab	PCC	0	0	3	1.5
9	20ME3201	Product Development Lab-1 (Fusion 360)	SC	1	0	2	2
10	20MC3502	Universal Human Values	MC	2	0	0	0
Total				18	0	11	21.5

Category	CREDITS
Basic Science course	6.0
Professional Core Course	13.5
Skill oriented course	2.0
TOTAL CREDITS	21.5



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B.Tech. – Mechanical Engineering : IV SEMESTER

S.No	Sub. Code	Name of the Course	Course Component				Credits
				L	T	P	
1	20ES4009	OOP through Java	ESC	3	0	0	3
2	20ME4004	Fluid Mechanics & Hydraulic Machinery	PCC	3	0	0	3
3	20ME4005	Metal Cutting and Machine Tools	PCC	3	0	0	3
4	20ME4006	Design of Machine Members-I	PCC	3	0	0	3
5	20ME4007	Thermal Engineering	PCC	3	0	0	3
6	20ES4109	JAVA Programming Lab	ESC	0	0	3	1.5
7	20ME4104	Fluid Mechanics & Hydraulic Machinery Lab	PCC	0	0	3	1.5
8	20ME4105	Machine Tools Lab	PCC	0	0	3	1.5
9	20ME4202	Product Development Lab-2	SC	1	0	2	2
Total				16	0	11	23
Internship 2 Months (Mandatory) during summer vacation							
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				L	T	P	C
				4	0	0	4

Category	CREDITS
Engineering Science Course	4.5
Professional Elective Courses	15
Skill oriented course	02
TOTAL CREDITS	21.5



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Department of Mechanical Engineering

Course Structure – AR20: B.Tech. – Mechanical Engineering : V SEMESTER

S.No.	Course Code	Name of the Course	Course Component	L	T	P	Maximum Marks			Credits	
							Internal	External	Total		
1	20ME5001	Theory of Machines	PCC	3	1	0	30	70	100	3	
2	20ME5002	Design of machine members – II	PCC	3	1	0	30	70	100	3	
3	20MA4006	Probability and Statistics	BSC	3	1	0	30	70	100	3	
4	20XX54XX	Open Elective-I	OEC	3	1	0	30	70	100	3	
5	20ME53XX	Professional Elective-I 1. Steam & Gas Power Systems 2. Composite Materials 3. Mechanical Vibrations & Condition Monitoring 4. Creep, Fatigue & Fracture Mechanics 5. 12 Weeks SWAYAM / NPTEL Course *	PEC	3	1	0	30	70	100	3	
6	20ME5101	Thermal Engineering Lab	PCC	0	0	3	15	35	50	1.5	
7	20ME5102	Theory of Machines Lab	PCC	0	0	3	15	35	50	1.5	
8	20ME6204	Analysis and Computation Lab (MATLAB)	SC	1	0	2	50	50	100	2	
9	20MC5503	Essence of Indian Traditional Knowledge	MC	2	0	0	-	-	-	0	
10	20ME4801	Mandatory Summer Internship 2 Months after second year (to be evaluated during V semester)	PROJ	0	0	0	-	-	50	1.5	
Total				18	0	08					21.5
Honors / Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)							L	T	P	C	
							4	0	0	4	

* Student can register any course subject to the approval from B.O.S.



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Category	CREDITS
Professional Core Courses	09
Basic Science course	03
Professional Elective Courses	03
Open Elective Courses	03
Skill oriented course	02
Summer Internship	1.5
TOTAL CREDITS	21.5

Professional Elective – I		
S.No.	Course Code	Name of the Course
1	20ME5301	Steam & Gas Power Systems
2	20ME5302	Composite Materials
3	20ME5303	Mechanical Vibrations & Condition Monitoring
4	20ME5304	Creep, Fatigue & Fracture Mechanics
5	12 Weeks SWAYAM / NPTEL Course *	

Open Elective-I					
S.No.	Course Code	Name of the Course	S.No.	Course Code	Name of the Course
1	20CE5401	Air Pollution Control	6	20EC5402	Data Communications
2	20CE5402	Fundamentals of Building Planning	7	20CS5401	Distributed Computing
3	20EE5401	Estimating and Costing of Electrical Systems	8	20CS5402	Software Engineering
4	20EE5402	PLC/SCADA			
5	20EC5401	Bio Medical Electronics			



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VI SEMESTER

S.No.	Course Code	Name of the Course	Course Component	L	T	P	Maximum Marks			Credits	
							Internal	External	Total		
1	20ME6001	Metrology, Instrumentation & Control Systems	PCC	3	1	0	30	70	100	3	
2	20ME6002	Digital Manufacturing	PCC	3	1	0	30	70	100	3	
3	20ME6003	Heat transfer	PCC	3	1	0	30	70	100	3	
4	20ME63XX	Professional Elective-II: 1. Operations Research 2. Power Plant Engineering 3. Non-Traditional Machining & Forming Processes 4. Nano materials & Technology 5. 12 Weeks SWAYAM / NPTEL Course *	PEC	3	1	0	30	70	100	3	
5	20XX64XX	Open Elective-II	OEC	3	1	0	30	70	100	3	
6	20ME6101	Metrology, Instrumentation & Control Systems Lab	PCC	0	0	3	15	35	50	1.5	
7	20ME6102	Design & Analysis Lab.	PCC	0	0	3	15	35	50	1.5	
8	20ME6103	Heat Transfer Lab	PCC	0	0	3	50	50	100	1.5	
9	20HS5201	Employability and corporate readiness skills (ECR)	SC	1	0	2	50	50	100	2	
10	20MC6504	Indian Constitution	MC	2	0	0	-	-	-	0	
Internship 2 Months (Mandatory) during summer vacation											
Total				18	0	11					21.5
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)							L	T	P	C	
							4	0	0	4	

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Category	CREDITS
Professional Core Courses	13.5
Professional Elective Courses	03
Open Elective Courses	03
Skill oriented course	02
TOTAL CREDITS	21.5

Professional Elective – II		
S.No.	Course Code	Name of the Course
1	20ME6301	Operations Research
2	20ME6302	Power Plant Engineering
3	20ME6303	Non-Traditional Machining & Forming Processes
4	20ME6304	Nano materials & Technology
5	12 Weeks SWAYAM / NPTEL Course *	

Open Elective-II					
S.No.	Course Code	Name of the Course	S.No.	Course Code	Name of the Course
1.	20CE6403	Building Material and Construction	5.	20EC6403	Linear and Digital ICs
2.	20CE6404	Construction Technology & Management	6.	20EC6404	Signal Processing
3.	20EE6403	Solar Energy and battery management systems	7.	20CS6403	Web Technologies
4.	20EE6404	Hybrid Energy Systems	8.	20CS6404	Mobile Computing
		20HS6406			National Cadet Corps



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VII SEMESTER (Proposed)

S.No.	Course Code	Name of the Course	Course Component	L	T	P	Credits
1	20ME73XX	Professional Elective-III	PEC	3	0	0	3
2	20ME73XX	Professional Elective-IV	PEC	3	0	0	3
3	20ME73XX	Professional Elective-V	PEC	3	0	0	3
4	20XX74XX	Open Elective-III	OEC	2	0	2	3
5	20XX74XX	Open Elective-IV	OEC	2	0	2	3
6	20HS74XX	Humanities & Social Science Elective	HSSE	3	0	0	3
7	20ME7205	Advanced Manufacturing Lab (CNC, 3D Printing & Robotic Arm)	SC	1	0	2	2
8	20ME7802	Summer Internship 2 Months*	PROJ	0	0	0	3
Total				17	0	6	23

*(Mandatory) after third year (to be evaluated during VII semester)

Category	CREDITS
Professional Elective Courses	09
Open Elective Courses	06
Humanities & Social Science	03
Skill oriented course	02
Project	03
TOTAL CREDITS	23



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Professional Elective – III			Professional Elective – V		
S.No.	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	20ME7301	Production Planning & Control	1	20ME7309	Industrial Robotics & Applications
2	20ME7302	Heating, Ventilation and Air Conditioning	2	20ME7310	Green Engineering Systems
3	20ME7303	Total Quality Management	3	20ME7311	Finite element methods
4	20ME7304	Electric & Hybrid Vehicles	4	20ME7312	Computational Fluid Dynamics
Professional Elective – IV			Humanities and Social Science Electives		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	20ME7305	Automobile Engineering	1	20HS7402	Management Science
2	20ME7306	Non-Destructive Evaluation	2	20HS7403	Industrial Engineering and Management
3	20ME7307	Additive Manufacturing	3	20HS7404	Management and Organizational Behaviour
4	20ME7308	Mechatronics	4	20HS7405	Constitutional Labour Laws

Open Elective-III		
S.No.	Course Code	Course Name
1	20CE7405	Industrial Waste Management
2	20CE7406	Traffic Engineering & Management
3	20EE7405	Utilization of Electrical Energy
4	20EE7406	Control Systems
5	20EC7405	Telecommunication Switching Systems and Networks
6	20EC7406	Cellular and Mobile Communications
7	20CS7405	Internet of Things
8	20CS7406	Data Sciences
9	20HS7401	Intellectual Property Rights and Patents



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Open Elective-IV		
S. No	Course Code	Course Name
1	20CE7407	Interior Design
2	20CE7408	Disaster Management
3	20EE7407	Special Electrical Machines
4	20EE7408	Electrical Measurements and Instrumentation
5	20EC7407	VLSI Design
6	20EC7408	Introduction to MEMS
7	20CS7407	Principles of Cloud Computing
8	20CS7408	Big Data Analytics
9	20MA7409	Statistics with R- Programming

VIII SEMESTER (Proposed)

S.No.	Course Code	Name of the Course	Course Component	L	T	P	Credits
1	20ME8901	Project Work, Seminar and internship in Industry	PROJ	0	0	0	12
Total				0	0	0	12

Note: As per JNTUK and APPSCHE guide lines NSS/NCC is mandatory. Every student must contribute 64 hours of service in the course of study.

Category	CREDITS
Project	12
TOTAL CREDITS	12



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Open Electives offered by Mechanical Engineering Department

Open Elective - I		Open Elective - II	
Course Code	Name of the Course	Course Code	Name of the Course
20ME5401	Non-Destructive Evaluation	20ME6403	Operations Research
20ME5402	Green Engineering Systems	20ME6404	Industrial Robotics & Applications
Open Elective - III		Open Elective - IV	
Course Code	Name of the Course	Course Code	Name of the Course
20ME7405	Nano-materials & Technology	20ME7407	Total Quality Management
20ME7406	Production Planning and Control	20ME7408	Electric & Hybrid Vehicles



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List of Courses for Honors Degree

HONORS IN MECHANICAL ENGINEERING		Pre-requisites
POOL – 1 (in II-II)		
20MEH401	Advanced Mechanics of Fluids	Fluid Mechanics
20MEH402	Green Manufacturing	Production Technology
20MEH403	Analysis and Synthesis of Mechanisms	Kinematics of Machinery
20MEH404	Advanced Thermodynamics	Basic Thermodynamics
20MEH405	Gear Engineering	Kinematics of Machinery
POOL-2 (in III-I)		
20MEH501	Experimental Methods in Fluid Mechanics	Fluid Mechanics
20MEH502	Advanced Optimization Techniques	Operations Research
20MEH503	Micro Electro Mechanical Systems	Nil
20MEH504	Combustion, emissions and environment	Thermal Engineering
20MEH505	Statistical Design in Quality Control	Nil
POOL-3 (in III-II)		
20MEH601	Advanced Computational Fluid Dynamics	Fluid Mechanics
20MEH602	Material Characterization Techniques	Material Science and Metallurgy
20MEH603	Product Design	Nil
20MEH604	Advanced IC Engines and Electric & Hybrid Vehicles	Thermal Engineering
20MEH605	Mechanical Vibrations & Acoustics	Nil
POOL-4 (in IV-I)		
20MEH701	Alternative Fuels Technologies	Nil
20MEH702	Design for Manufacturing and Assembly	Production Technology
20MEH703	Robotics and Control	Kinematics of Machinery
20MEH704	Turbo Machines	FM&HM
20MEH705	ERP Systems for Manufacturing	Nil



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Suggested 12 Weeks SWAYAM / NPTEL Courses for B.Tech. Honors Degree in Mechanical Engineering

S.No.	Title of the Course	Level
1	Fundamentals of Nuclear Power Generation	PG
2	Computer Integrated Manufacturing	PG
3	Introduction To Mechanical Micro Machining	PG
4	Product Design and Manufacturing	PG
5	Industrial Automation And Control	PG
6	Applied Ergonomics	PG
7	Foundations of Computational Materials Modeling	PG
8	Financial Mathematics	PG
9	Industrial Safety Engineering	PG
10	Mathematical Modeling Of Manufacturing Processes	PG
11	Work System Design	PG
12	Energy Conservation and Waste Heat Recovery	PG
13	Turbulent Combustion: Theory and Modelling	PG
14	Dynamic Behavior Of Materials	PG
15	Plastic Working Of Metallic Materials	PG
16	Fundamentals of Surface Engineering: Mechanisms, Processes and Characterizations	PG
17	Fundamentals Of Artificial Intelligence	PG
18	Aircraft Propulsion	PG
19	Principles of Mechanical Measurement	PG
20	Industrial Automation and Control	PG



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21	Rapid Manufacturing	PG
22	Machinery Fault Diagnosis And Signal Processing	PG
23	Spray Theory	PG
24	Financial Mathematics	PG
25	Introduction To Composites	PG
26	Surface engineering for corrosion and wear resistance	PG
27	Material characterization	PG

Note: Choice of SWAYAM / NPTEL Courses is not limited to the above course list. Students can register for a relevant/equivalent available course, after approval from the Board of Studies of the department.



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List of Courses for Minors Degree

Minors program offered by Mechanical Engineering Department

B.Tech. (MINOR)in MECHANICAL ENGINEERING		Pre-requisites
20MEM01	Basic Thermodynamics	NIL
20MEM02	Manufacturing Processes	NIL
20MEM03	Engineering Materials	NIL
20MEM04	Basic Mechanical Design	NIL
20MEM05	Optimization Techniques	NIL
20MEM06	Power Plant Engineering	Basic Thermodynamics
20MEM07	Automobile Engineering	Basic Thermodynamics
20MEM08	Industrial Engineering and Management	NIL
20MEM09	Product Design & Development	NIL
20MEM10	Introduction to Industry 4.0	NIL
20MEM11	Mechanical Measurements	NIL
20MEM12	Industrial Robotics	Engineering Mechanics
20MEM13	Mechatronics	NIL



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Suggested 12 Weeks SWAYAM / NPTEL Courses for

B.Tech. Minors in Mechanical Engineering

S.No.	Title of the Course
1	IC Engines and Gas Turbines
2	Conduction and Convection Heat Transfer
3	Introduction To Fluid Mechanics
4	Manufacturing Process Technology I & II
5	Operations Management
6	Computational Fluid Dynamics for Incompressible Flows
7	Experimental Methods in Fluid Mechanics
8	Principles of Industrial Engineering
9	Engineering Mechanics
10	Engineering Fracture Mechanics
11	Solid Mechanics
12	Fundamentals of manufacturing processes
13	Manufacturing Systems Technology Part I & II
14	Advanced Concepts in Fluid Mechanics
15	Concepts of Thermodynamics
16	Applied Thermodynamics For Engineers
17	Fundamentals of Conduction and Radiation
18	Fundamentals of Gas Dynamics

Note: Choice of SWAYAM / NPTEL Courses is not limited to the above course list. Students can register for a relevant/equivalent available course, after approval from the Board of Studies of the department.



RAGHU INSTITUTE OF TECHNOLOGY

AUTONOMOUS

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Accredited by NBA (ECE, EEE, MECH, CSE) & NAAC with 'A' Grade, Listed u/s 2(f) & 12(B) of UGC Act 1956.
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Courses Components and Credits Distribution

S.No.	Course Component	No. of Courses		No. of Credits
		Theory	Lab	
1.	HSMC	3	1	10.5
2.	BSC	5	2	18
3.	ESC	6	4	24
4.	PCC	13	10	54
5.	OEC	4	0	12
6.	PEC	5	0	15
7.	PROJ			16.5
8.	MC	4	0	0
9.	SC	0	5	10
Total				160