



**Jawaharlal Nehru Technological  
University Anantapur College of Engineering  
Pulivendula –516 390 (A.P) India**

**B.Tech. in Mechanical Engineering  
Course Structure and Syllabi  
under R20 Regulations**

**Effective from AY 2021-22**

**MECHANICAL ENGINEERING**

<b>Semester –0</b>			
<b>S.No</b>	<b>Course Name</b>	<b>Category</b>	<b>L-T-P-C</b>
1	Physical Activities -- Sports, Yoga and Meditation, Plantation	MC	0-0-6-0
2	Career Counselling	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	2-0-0-0
5	Proficiency Modules & Productivity Tools	ES	2-0-0-0
6	Assessment on basic aptitude and mathematical skills	MC	2-0-3-0
7	Remedial Training in Foundation Courses	MC	2-0-3-0
8	Human Values & Professional Ethics	MC	3-0-3-0
9	Communication Skills -- focus on Listening, Speaking, Reading, Writing skills	BS	2-0-2-0
10	Concepts of Programming	ES	2-0-0-0

**B.Tech I Year I Semester**

<b>Semester –1</b>					
<b>S.No</b>	<b>Course No</b>	<b>Course Name</b>	<b>Category</b>	<b>L-T-P</b>	<b>Credits</b>
1	20ABS05	Linear Algebra and Calculus	BS	3-0-0	3
2	20ABS01	Engineering Physics	BS	3-0-0	3
3	20AME02	Material Science	ES	3-0-0	3
4	20ABEE01	Basic Electrical & Electronics Engineering	ES	3-0-0	3
5	20AME04	Engineering Workshop	ES	0-0-3	1.5
6	20ACS05	IT Workshop	ES	0-0-3	1.5
7	20ABS02	Engineering Physics Lab	BS	0-0-3	1.5
8	20AME03	Material Science Lab	ES	0-0-3	1.5
9	20ABEE02	Basic Electrical & Electronics Engineering lab	ES	0-0-3	1.5
				<b>Total</b>	<b>19.5</b>

**B.Tech I Year II Semester**

<b>Semester – 2</b>					
<b>S.No</b>	<b>Course No</b>	<b>Course Name</b>	<b>Category</b>	<b>L-T-P</b>	<b>Credits</b>
1	20ABS06	Differential Equations and Vector Calculus	BS	3-0-0	3
2	20ABS07	Engineering Chemistry	BS	3-0-0	3
3	20AHS01	Communicative English	HS	3-0-0	3
4	20ACS10	C Programming	ES	3-0-0	3
5	20AME01	Engineering Graphics	ES	1-0-2	2
6	20AME05	Computer Aided Drafting Lab	ES	0-0-2	1
7	20AHS02	Communicative English Lab	HS	0-0-3	1.5
8	20ABS08	Engineering Chemistry lab	BS	0-0-3	1.5
9	20ACS11	C Programming Lab	ES	0-0-3	1.5
				<b>Total</b>	<b>19.5</b>

*V. Venkatesh*  
BOS Chairman

*Praveen*  
Vice-Principal

*G. Srinivas*  
Principal

**B.Tech II Year I Semester**

Semester – 3					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20ABS13	Complex Variables, Transforms & Applications to PDE	BS	3-0-0	3
2	20AME06	Mechanics of materials	PC	3-0-0	3
3	20AME08	Fluid mechanics and hydraulic machinery	PC	3-0-0	3
4	20AME10	Manufacturing Processes	PC	3-0-0	3
5	20AME12	Thermodynamics	PC	3-0-0	3
6	20ACS12	Data structures (Skill Oriented Course – I)	SC	1-0-2	2
7	20AME07	Mechanics of materials Lab	PC	0-0-3	1.5
8	20AME09	Fluid mechanics and hydraulic machinery lab	PC	0-0-3	1.5
9	20AME11	Manufacturing processes lab	PC	0-0-3	1.5
10	20ABS09	Environmental Science	MC	3-0-0	0
11	20AMC01	NSS activities	MC	0-0-2	0
<b>Total</b>					<b>21.5</b>

**B.Tech II Year II Semester**

Semester – 4					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20ABS15	Numerical Methods, Probability and Statistics	BS	3-0-0	3
2	20ACS21	Internet of Things (IOT)	ES	3-0-0	3
3	20AME13	Thermal Engineering	PC	3-0-0	3
4	20AME14	Theory of Machines	PC	3-0-0	3
5	20AHS03	Universal Human Values	MC	3-0-0	3
6		Humanities Elective I	HE	3-0-0	3
	20AHS04	Managerial Economics & Financial Analysis			
	20AHS05	Entrepreneurship & Incubation			
7	20AME19	Computer aided machine drawing( Skill Oriented Course – II)	SC	1-0-2	2
8	20AME18	Mechanical Engineering Workshop	PC	0-0-3	1.5
9	20AME15	Thermal Engineering Lab	PC	0-0-3	1.5
10	20AME16	Design Thinking and Product Innovation Lab	PC	0-0-3	1.5
11	20AME17	Design thinking and product innovation	MC	3-0-0	0
<b>Total</b>					<b>24.5</b>
Mandatory Community Service Project/ Internship during Summer Vacation					

- ❖ Eligible & interested students are permitted to register for Honours or a Minor in IV semester after the results of III Semester are declared and students may be allowed to take maximum two subjects per semester pertaining to their Honours or a Minor from V Semester onwards.
- ❖ A student is permitted to select a Minor program only if the institution is already offering a Major degree program in that discipline.

*W. Beer*  
BOS Chairman

*Deep*  
Vice-Principal

*g. Srinivas*  
Principal



**B.Tech III Year I Semester**

Semester - 5					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20AME51	Operations Research	PC	3-0-0	3
2	20AME52	Design of Machine Members	PC	3-0-0	3
3	20AME53	Metrology and Measurements	PC	3-0-0	3
4	20AME54	Professional Elective – I	PE	3-0-0	3
	20AME54A	Design for Manufacturing			
	20AME54B	Power Plant Engineering			
	20AME54C	Non Destructive Testing			
5	20AME55	Open Elective – I	OE	3-0-0	3
6	20AHS10	Soft Skills (Skill oriented course – III)	SC	1-0-2	2
7	20AME57	Metrology and Measurements Lab	PC	0-0-3	1.5
8	20AME58	Dynamics and Machine tools Lab	PC	0-0-3	1.5
9	20AMC02	Aptitude and Reasoning Skills	MC	3-0-0	0
10	20AME59	Evaluation of Community Service Project/Internship	PR	0-0-0	1.5
<b>Total</b>					<b>21.5</b>

**Open Elective I (Interdisciplinary)**

Branch	Subject Code	Subject
Mathematics	20ABS55A	Fuzzy Set Theory, Arithmetic and Logic
Physics	20ABS55B	Functional Nanomaterials for Engineers
Chemistry	20ABS55C	Chemistry of Energy Materials
CIVIL	20ACE55A	Basics of Civil Engineering
EEE	20AEE55A	Basics of Non-Conventional Energy Sources
ECE	20AEC55A	Fundamentals of Electronics and Communication Engineering
	20AEC55B	Transducers and Sensors
CSE	20ACS55A	Fundamentals of Internet of Things
	20ACS55B	E-Marketing
	20ACS55C	Computer Architecture and organization

**Note:** A student shall not be permitted to take courses as Open Electives/Minor/Honours with content substantially equivalent to the courses pursued in the student's primary major.

  
BOS Chairman

  
Vice-Principal

  
Principal



**B.Tech III Year II Semester**

Semester - 6					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20AME61	Introduction to CAD/CAM	PC	3-0-0	3
2	20AME62	Automation & Robotics	PC	3-0-0	3
3	20AME63	Heat Transfer	PC	3-0-0	3
4	20AME64	Professional Elective – II(MOOC-I)	PE	3-0-0	3
5		Humanities Elective – II	HS	3-0-0	3
	20AHS12	Management Science			
	20AHS13	Business Environment			
6	20AME66	Computer aided design Lab	PC	0-0-3	1.5
7	20AME67	Computer aided manufacturing Lab	PC	0-0-3	1.5
8	20AME68	Heat Transfer Lab	PC	0-0-3	1.5
9	20AME60	3D Printing Practice (Skill Oriented Course – IV)	SC	1-0-2	2
10	20AHS11	Indian Constitution	MC	3-0-0	0
<b>Total</b>					<b>21.5</b>

Note: Student shall register for MOOC Course in NPTEL/SWAYAM in concurrence with the department before commencement of semester. The advanced courses should opt which is not repetitive regular courses and syllabus.

**B.Tech IV Year I Semester**

Semester - 7					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20AME71	Professional Elective – III	PE	3-0-0	3
	20AME71A	Automobile Engineering			
	20AME71B	Finite Element Methods			
	20AME71C	Total Quality Management			
2	20AME72	Professional Elective – IV	PE	3-0-0	3
	20AME72A	Tool Design			
	20AME72B	Refrigeration & Air Conditioning			
	20AME72C	Production and Operations Management			
3	20AME73	Professional Elective – V	PE	3-0-0	3
	20AME73A	Mechatronics & MEMS			
	20AME73B	Design of Hydraulics and Pneumatics			
	20AME73C	Geometric dimensioning and tolerances			
4	20AME75	Open Elective – II	OE	3-0-0	3
5	20AME76	Open Elective – III	OE	3-0-0	3
6	20AME77	Open Elective – IV (MOOC-I)	OE	3-0-0	3
7	20AME70	Industrial Automation (Skill oriented course – V)	SC	1-0-2	2
8	20AME79	Evaluation of Internship	PR	-----	3
<b>Total</b>					<b>23</b>

*W. Reddy*  
BOS Chairman

*Dr. S. S. S. S.*  
Vice-Principal

*G. S. S. S.*  
Principal

**Open Elective II (Interdisciplinary)**

Branch	Subject Code	Subject Name
Mathematics	20ABS65A	Numerical Techniques
Physics	20ABS65B	Materials Characterization Techniques
Chemistry	20ABS65C	Polymers and their applications
CIVIL	20ACE65A	Environmental Impact Assessment
EEE	20AEE65A	Energy Conservation and Management
ECE	20AEC65A	Introduction to Microcontrollers & Applications
	20AEC65B	Principles of Digital Signal Processing
CSE	20ACS65A	Machine Learning Applications
	20ACS65B	Object Oriented Programming
	20ACS65C	Web Design

**Open Elective III (Interdisciplinary)**

Branch	Subject Code	Subject Name
Mathematics	20ABS75A	Mathematical Modeling
Physics	20ABS75B	Sensors and Actuators for Engineering Applications
Chemistry	20ABS75C	Chemistry of Nano-materials and applications
CIVIL	20ACE75A	Disaster Management and Mitigation
EEE	20AEE75A	IOT Applications in Electrical Engineering
ECE	20AEC75A	Fundamentals of Image Processing
	20AEC75B	Basics of VLSI Design
CSE	20ACS75A	Applications of AI
	20ACS75B	Mobile Application Development

**B.Tech IV Year II Semester**

Semester - 8					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20AME89	Full Internship & Project work	PR	-----	12
				<b>Total</b>	<b>12</b>

**Courses offered for Honours degree**

S.No.	Course Code	Course Title	Offered in Semester	Prerequisite if any	Contact Hours per week		Credits
					L	T	
1	20AMEH01	Advanced Automotive Electronics	V		3	1	4
2	20AMEH02	Application of Computational Fluid Dynamics	VII		3	1	4
3	20AMEH03	Mechanics and manufacturing of Composite materials	VI		3	1	4
4	20AMEH04	Applications of Optimization Techniques	VI		3	1	4
5	20AMEH05	MOOC Course	V				2
6	20AMEH06	MOOC Course	VII				2

**Title of the Minor Degree  
(Disciplines to which the Minor is offered)**

S. No	Branch	Name of the Minor degree	Course Code	Course Title	Offered in Semester	Contact Hours per week			Credits
						L	T	P	
1	ME	3D Printing	20AMEM07	Materials science for Engineers	V	3	1	0	4
2			20AMEM08	Computer Aided Machine Drawing	V	3	1	0	4
3			20AMEM09	3D Printing materials	VI	3	1	0	4
4			20AMEM10	Applications of 3D Printing	VII	3	1	0	4
5			20AMEM11	MOOC Course	VI				2
6			20AMEM12	MOOC Course	VII				2
1	ME	Robotics and Automation	20AMEM13	Introduction to Robotics	V	3	1	0	4
2			20AMEM14	Industrial Automation	V	3	1	0	4
3			20AMEM15	Hydraulic and Pneumatic circuits	VI	3	1	0	4
4			20AMEM16	Programming and control of Robot	VII	3	1	0	4
5			20AMEM17	MOOC Course	VI				2
6			20AMEM18	MOOC Course	VII				2
1	ME	Industrial Engineering	20AMEM19	Production Planning and Control	V	3	1	0	4
2			20AMEM20	Marketing Management	VI	3	1	0	4
3			20AMEM21	Customer Relationship Management	VI	3	1	0	4
4			20AMEM22	Six Sigma & Lean Manufacturing	VII	3	1	0	4
5			20AMEM23	MOOC Course	V				2
6			20AMEM24	MOOC Course	VII				2
1	CE	Construction Technology	20ACEM01	Building Materials	V	3	1	0	4
2			20ACEM02	Building Construction	V	3	1	0	4
3			20ACEM03	Building planning and Drawing	VI	3	1	0	4
4			20ACEM04	Surveying	VI	3	1	0	4
5			20ACEM05	MOOC Course	VII				2
6			20ACEM06	MOOC Course	VII				2
1	EEE	Electrical Systems	20AEEM01	Basic Electric Circuits and Analysis	V	3	1	0	4
2			20AEEM02	Principles of Electrical Measurements	V	3	1	0	4
3			20AEEM03	Basics of Power Electronics and Devices	VI	3	1	0	4
4			20AEEM04	Fundamentals of Control Systems	VI	3	1	0	4
5			20AEEM05	MOOC Course	VII				2
6			20AEEM06	MOOC Course	VII				2
1	ECE	Electronics & Communication Engineering	20AECM01	Electronic Circuits	V	3	1	0	4
2			20AECM02	Digital Electronics	V	3	1	0	4
3			20AECM03	Principles of Communications	VI	3	1	0	4
4			20AECM04	Electronic Instrumentation	VI	3	1	0	4
5			20AECM05	MOOC Course	VII				2
6			20AECM06	MOOC Course	VII				2
1	CSE	Web Design & Development	20ACSM01	User Interface Design	V	3	1	0	4
2			20ACSM02	Advanced Java Script	VI	3	1	0	4
3			20ACSM03	Content Management & Distributed systems	VI	3	1	0	4
4			20ACSM04	Mongo DB	VII	3	1	0	4
5			20ACSM05	MOOC Course	V				2
6			20ACSM06	MOOC Course	VII				2



*Mechanical Engineering (Course Structure)*

*R20*

1	CSE	Data Science	20ACSM07	Data Science	V	3	1	0	4
2			20ACSM08	Data Analytics using Python and Lab	V	3	0	2	4
3			20ACSM09	Data Visualization	VII	3	1	0	4
4			20ACSM10	Machine Learning	VI	3	1	0	4
5			20ACSM11	MOOC Course	VI				2
6			20ACSM12	MOOC Course	VII				2

  
BOS Chairman

  
Vice-Principal

  
Principal