ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES (AUTONOMOUS)

DEPARTMENT OF MECHANICAL ENGINEERING

CURRICULUM (REGULATIONS – R23)

A.Y. 2023-24

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING - CURRICULUM
REGULATIONS – R23 for the A.Y 2023-24

Ist Year - Semester – I									
Course Code	**Title of the course**	**Category**	**Periods/Week**			**Sessional Marks**	**Semester End exam Marks**	**Total Marks**	**Credits**
			L	**T**	**P**				
23MA1101	Linear Algebra and Multivariable Calculus	BS	2	1	-	40	60	100	3
23PY1101	Engineering Physics	BS	3	-	-	40	60	100	3
23CY1101	Engineering Chemistry	BS	3	-	-	40	60	100	3
23ME3101	Materials Science	ES	3	-	-	40	60	100	3
23ME3201	Computer Aided Engineering Graphics	ES	1	-	4	50	50	100	3
23CY1201	Engineering Chemistry Lab	BS	-	-	3	50	50	100	1.5
23PY1201	Engineering Physics Lab	BS	-	-	3	50	50	100	1.5
23ME3202	Engineering & IT Workshop	ES	-	-	3	50	50	100	1.5
23MC0101	Universal Human Values & Professional Ethics (Mandatory non-credit course)	MC	2	-	-				0
Total						**360**	**440**	**800**	**19.5**

Ist Year - Semester – II									
Course Code	**Title of the course**	**Category**	**Periods/Week**			**Sessional Marks**	**Semester End exam Marks**	**Total Marks**	**Credits**
			L	**T**	**P**				
23MA1102	Ordinary Differential Equations and Numerical Methods	BS	2	1	-	40	60	100	3
23EN2101	Communicative English	HS	3	-	-	40	60	100	3
23CS3101	Problem solving and Programming using C	ES	3	-	-	40	60	100	3
23ME3103	Engineering Mechanics	ES	2	1	-	40	60	100	3
23ME3203	Assembly and Production Drawing	ES	1	-	4	50	50	100	3
23EN2201	English Language Laboratory	HS	-	-	3	50	50	100	1.5
23CS3201	Problem solving and Programming using C – lab	ES	-	-	3	50	50	100	1.5
23EC4212	Internet of Things (IOT) Lab	ES	0	-	3	50	50	100	1.5
23MC0102	Environmental Sciences (Mandatory non-credit course)	MC	2	-	-	-			0
Total						**360**	**440**	**800**	**19.5**

IInd Year - Semester – I									
Course Code	**Title of the course**	**Category**	**Periods/Week**			**Sessional Marks**	**Semester End exam Marks**	**Total Marks**	**Credits**
			L	**T**	**P**				
23MA1103	Vector Calculus and Transform Techniques	BS	2	1	-	40	60	100	3
23ME4111	Fluid Mechanics & Hydraulic Machinery	PC	2	1	-	40	60	100	3
23ME4112	Mechanics of Solids	PC	2	1	-	40	60	100	3
23ME4113	Engineering Thermodynamics	PC	2	1	-	40	60	100	3
23ME4114	Manufacturing Processes	PC	3	-	-	40	60	100	3
23ME9201	Computer Aided Geometrical Modelling	SC	1	-	2	50	50	100	2
23ME4211	Mechanics of Solids & Materials Science lab	PC	-	-	3	50	50	100	1.5
23ME4212	Manufacturing Processes Lab	PC	-	-	3	50	50	100	1.5
23CR9101	Logical Reasoning & Corporate Skills	HS	1	-	-	50	-	50	1
23MC0104	Entrepreneurship and IPR	MC	2	-	-				0
Total						**400**	**450**	**850**	**21**

IInd Year - Semester – II									
Course Code	**Title of the course**	**Category**	**Periods/Week**			**Sessional Marks**	**Semester End exam Marks**	**Total Marks**	**Credits**
			L	**T**	**P**				
23MA1106	Complex Variables and Sampling Theory	BS	2	1	-	40	60	100	3
23EE3101	Basics of Electrical & Electronics Engineering	ES	2	1	-	40	60	100	3
23ME4115	Applied Thermodynamics - I	PC	2	1	-	40	60	100	3
23ME4116	Kinematics of Machinery	PC	2	1	-	40	60	100	3
23ME4117	Design of Machine Elements-I	PC	2	1	-	40	60	100	3
23ME4118	Metal Cutting, Machine Tools and Metrology	PC	3	-	-	40	60	100	3
23ME4213	Fluid Mechanics & Hydraulic Machinery - Lab	PC	-	-	3	50	50	100	1.5
23EE3201	Basic Electrical & Electronics Engineering-Lab	ES	-	-	3	50	-	50	1.5
23CR9102	Numerical Ability & Professional Communication	HS	1	-	-	50	-	50	1
23MC0106	Fundamentals of Biology for Engineers	MC	2	-	-				0
Total						**390**	**410**	**800**	**22.0**

III[rd] Year - Semester – I									
Course Code	Title of the course	Category	Periods/Week			Sessional Marks	Semester End exam Marks	Total Marks	Credits
			L	T	P				
***	Open Elective- I	OE	3	-	-	40	60	100	3
23ME5111/ 23ME5112/ 23ME5113/ 23ME5114/ 23ME5115	Professional Elective-I Advanced Mechanics of Solids/ Non-Destructive Testing/ Alternate Fuels / Managerial Economics and Financial Accountancy/ Nano Technology	PE	3	-	-	40	60	100	3
23ME4119	Dynamics of Machinery	PC	2	1	-	40	60	100	3
23ME4120	Applied Thermodynamics - II	PC	2	1	-	40	60	100	3
23ME9202	Python for Engineers	SC	1	-	2	50	50	100	2
23ME3204	Design Thinking	ES	1	-	2	50	50	100	2
23ME4214	Kinematics and Dynamics of Machinery -Lab	PC	-	-	3	50	50	100	1.5
23ME4215	Thermal Engineering Lab	PC	-	-	3	50	50	100	1.5
23CR9103	Quantitative Aptitude & Effectual Communication	HS	-	-	2	50	-	50	1
23ME9401	INTERNSHIP-I	PR	-	-	-	100	-	100	1.5
23MC0107	Sociology of Gender	NMNC	2	-	-	-	-	-	0
Total						**510**	**440**	**950**	**21.5**

III[rd] Year - Semester – II									
Course Code	Title of the course	Category	Periods/Week			Sessional Marks	Semester End exam Marks	Total Marks	Credits
			L	T	P				
***	Open Elective- II	OE	3	-	-	40	60	100	3
23ME5121/ 23ME5122/ 23ME5123/ 23ME5124/ 23ME5125	Professional Elective-II Mechanical Measurements/ Additive Manufacturing/ Waste Heat Recovery Technologies/ Research Methodology/ Introduction To Artificial Intelligence	PE	3	-	-	40	60	100	3
23ME4121	Heat Transfer	PC	2	1	-	40	60	100	3
23ME4122	Finite Element Analysis	PC	2	1	-	40	60	100	3
23ME4123	Hybrid and e-Vehicles	PC	1	1	-	40	60	100	2
23ME4124	Design of Machine Elements-II	PC	2	1	-	40	60	100	3
23ME4216	Machine Tools and Metrology Lab	PC	-	-	3	50	50	100	1.5
23ME9203	Computer Aided Manufacturing and Finite Element Analysis Lab	SC	1	-	2	50	50	100	2
23CR9104	High Level Reasoning & Employability Skills	HS	1	-	-	50	-	50	1
23MC0108	Foreign Languages/ Hindi(MOOCS)	NMNC	2	-	-	-	-	-	
Total						**390**	**460**	**850**	**21.5**

IVth Year - Semester – I									
Course Code	Title of the course	Category	Periods/Week			Sessional Marks	Semester End exam Marks	Total Marks	Credits
			L	T	P				
***	Open Elective- III	OE	3	-	-	40	60	100	3
23ME5131/ 23ME5132/ 23ME5133/ 23ME5134/ 23ME5135	Professional Elective-3 Mechanical Vibrations/ Smart Manufacturing/ Refrigeration & Air-conditioning/ Industrial Engineering Management with Industry 4.0/ Mechatronics	PE	3	-	-	40	60	100	3
23ME5141/ 23ME5142/ 23ME5143/ 23ME5144/ 23ME5145	Professional Elective –4 Tribology / Advanced Manufacturing Processes/ Power Plant Engineering/ Production Planning & Control/ Energy Conservation Management	PE	3	-	-	40	60	100	3
23ME5151/ 23ME5152/ 23ME5153/ 23ME5154/ 23ME5155	Professional Elective -5 Condition Monitoring/ Automation in Manufacturing Non-Conventional Energy Sources/ Work Study/ Optimization Techniques	PE	3	-	-	40	60	100	3
23ME2101	Operations Research	HS	2	-	-	40	60	100	2
23ME9101	Robotics Engineering	PC	1	1	-	40	60	100	2
23ME9204	Robotics Lab	SC	-	-	2	50	50	100	1
23ME4217	Heat Transfer-Lab	PC	-	-	3	50	50	100	1.5
23ME9402	Internship-II	PR	-	-	-	100	-	100	1.5
23ME9501	Project Phase – I	PR	-	-	-	100	-	100	2
Total						**540**	**460**	**1000**	**22.0**

IVth Year - Semester – II									
Course Code	Title of the course	Category	Periods/Week			Sessional Marks	Semester End exam Marks	Total Marks	Credits
			L	T	P				
23ME6341	Open Elective- IV (MOOCS)	OE	3	-	-	40	60	100	3
23ME9502	Project Phase – II	PR	-	-	-	100	100	200	10
Total						**140**	**160**	**300**	**13**

PROFESSIONAL ELECTIVE	STREAM-1	STREAM-2	STREAM-3	STREAM-4	STREAM-5	DYNAMIC ELECTIVE
PE-1	Advanced Mechanics of Solids (AMOS)	*Non-Destructive Testing (NDT)	Alternate Fuels	Managerial Economics and Financial Accountancy (MEFA)	*Nano Technology (NT)	
PE-2	Mechanical Measurements	Additive Manufacturing	*Waste Heat Recovery Technologies	Research Methodology	*Energy Conservation Management	
PE-3	Mechanical Vibrations	Smart Manufacturing	Refrigeration & Air-conditioning	*Industrial Engineering Management with Industry 4.0	MEMS	
PE-4	Tribology	Advanced Manufacturing Processes	Power Plant Engineering	Production Planning & Control	Machine Tool Design	
PE-5	*Condition Monitoring	Automation In Manufacturing	Non-Conventional Energy Sources	Work study	Optimization Techniques	

*Partial Delivery by Industrial Experts

OPEN ELECTIVES OFFERED BY MECHANICAL DEPARTMENT				
OPEN ELECTIVE	STREAM-1	STREAM-2	STREAM-3	
OE-1	Principles of Robotics	Waste to Energy Conversion	Industrial Engineering and Management	
OE-2	CAD	Industrial Safety	Hybrid Vehicles	
OE-3	Principles of 3D Printing	Operations Research	Entrepreneurship Development	
OE-4	NPTEL Courses	NPTEL Courses	NPTEL Courses	

CROSS-CUTTING COURSES (MNC)		
III-I	Sociology of Gender/ Health and Nutrition	NPTEL/ Dietician

OPEN ELECTIVES PREFERRED FOR MECHANICAL DEPARTMENT (OFFERED BY OTHERS)		
OPEN ELECTIVE	SOFTWARE	EMERGING COURSE
OE-1	DBMS	Introduction to Artificial Intelligence
OE-2	Data Structures through Python	Introduction to Machine Learning
OE-3	Java/C++/ OOPS	Data Science/ Autonomous Vehicles
OE-4	NPTEL COURSES	NPTEL COURSES

List of Honors Courses offered

POOL	Course Code	Title of the course	Periods/Week			Sessional Marks	Semester End exam Marks	Total Marks	Credits
			L	T	P				
Pool-I (III Year- I Sem)	23ME8111	Fuels and Combustion Thermodynamics	3	1	-	40	60	100	4
	23ME8112	Quality Engineering and Management	3	1	-	40	60	100	
	23ME8113	Composite Materials	3	1	-	40	60	100	
	23ME8114	Design Engineering	3	1	-	40	60	100	
Pool-II (III Year- II Sem)	23ME8121	Inventory control and Supply Chain Management	3	1	-	40	60	100	4
	23ME8122	Reliability Engineering	3	1	-	40	60	100	
	23ME8123	Design for Manufacturing & Assembly	3	1	-	40	60	100	
	23ME8124	Advanced Fluid Mechanics	3	1	-	40	60	100	
Pool-III (IV Year- I Sem)	23ME8131	Autonomous Vehicles	3	1	-	40	60	100	4
	23ME8132	Gas Turbines and Jet Propulsion	3	1	-	40	60	100	
	23ME8133	Introduction to Fracture Mechanics	3	1	-	40	60	100	
	23ME8134	Vehicle Dynamics	3	1	-	40	60	100	
Pool-IV (IV Year- II Sem)	23ME8141	Theory of Elasticity & Plasticity with stress analysis lab	2	1	2	40	60	100	4
	23ME8142	Advanced Finite Element Analysis with simulation	2	1	2	40	60	100	
	23ME8143	Computational Fluid Dynamics with simulation	2	1	2	40	60	100	
	23ME8144	Synthesis and Analysis of Mechanisms with experimentation	2	1	2	40	60	100	
MOOCS	23ME8301	MOOCS-I	2	-	-	40	60	100	2
	23ME8302	MOOCS-II	2	-	-	40	60	100	2
Total Credits									**20**

List of Minors Courses offered

Course Code	Title of the course	Periods/Week			Sessional Marks	Semester End exam Marks	Total Marks	Credits
		L	T	P				
23ME7101	Elements of Mechanical Engineering	4	-	-	40	60	100	4
23ME7102	Principles & Practical of Manufacturing processes	3	-	2	40	60	100	4
23ME7103	Fundamentals of Mechanical Design	4	-	-	40	60	100	4
23ME7104	Operations Research	4	-	-	40	60	100	4
23ME7301	MOOCS-I	2	-	-	40	60	100	2
23ME7302	MOOCS-II	2	-	-	40	60	100	2

S. No.	Year	Ist Year		2nd Year		3rd Year		4th Year		Total	AICTE	APSCHE
	Sem	I	II	I	II	I	II	I	II			
	Category											
1	HS		4.5	1	1	1	1	2		10.5	12	10
2	BS	12	3	3	3					21	25	21
3	ES	7.5	12		4.5	2				26	24	24
4	PC			15	13.5	9	12.5	3.5		53.5	48	51
5	OE					3	3	3	3	12	18	12
6	PE					3	3	9		15	18	15
7	PR					1.5		3.5	10	15	15	17
8	MC									0	Non-credit	Non-credit
9	SC			2		2	2	1		7		10
	Total	**19.5**	**19.5**	**21**	**22**	**21.5**	**21.5**	**22**	**13**	160	**160**	**160**

Annexure

Course Codes Description				
Regulation	**Department offering the Course**	**Course Category**	**Type of Course**	**Course Number**
23	PY-Physics	MC - 0	Theory - 1	Regular - 01
	CY- Chemistry	BS - 1	Practical / Lab - 2	Professional Core - 11/12/…
	MM - Mathematics	HS /HE - 2	MOOCs - 3	Professional Elective - 11/21/31/41/51
	EN - English	ES -3	Summer Internship - 4	Open Elective - 11/21/31/41….
	CS- Computer Science and Engineering	PC - 4	Project Work - 5	
	CM - CSE with AIML	PE-5	Seminars - 6	
	CD CSE with Data Science	OE / JE - 6	NCC / NSS - 7	
	ES - Engineering Science	MINORS - 7		
	EE - Electrical and Electronics Engineering	HONORS - 8		
	EC- Electronics and Communication Engineering	SKILL COURSES - 9		
	CH - Chemical Engineering			
	ME - Mechanical Engineering			
	CE - Civil Engineering			
	IT - Information Technology			
	MC - Mandatory Course			
	CR - Campus Recruitment			
	HS - Human Science			