JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

Kakinada-533003, Andhra Pradesh (India)

Comparison of Program Structure R19 with R20

Program Code	Program Name	Total No. of Courses		No of Subjects			Total Courses	Percentage %
		R19	R20	Added in (R20)	Deleted (R19)	Content revised more than 20%		
B.Tech(1A) 03	B.Tech (ME)	107	103	10	13	5	28	27

Coordinator

REGISTRAR
J.N.T. University Kakinada
Kakinada-533003

HOD/BOS-Chairman
Mechanical Engineering Department
University College of Engineering
J.N.T. University Kakinada
KAKINADA

Comparison of Course Structure R19 with R20

Program Code: B.Tech(1A)**03**　　　　**Program Name:B.Tech–MECHANICAL ENGG.**　　　　**Year: I**　　　　**Semester:1**

| R19 | | | | | | R20 | | | | | Remarks | | |
Course code	Course name	L	T	P	C	Course code	Course name	L	T	P	C	New Course? (R20)	Deleted Course? (R19)	Content Revision %
BS1101	Mathematics-I	3	0	0	3	BSC-1	Mathematics-I (Calculus)	3	0	0	3			10
HS1101	Engineering Physics	3	0	0	3	BSC-2	Engineering Physics	3	0	0	3			
PC1102	Engineering Mechanics	3	0	0	3	ESC-1	Engineering Mechanics	3	0	0	3			
ES1101	Problem Solving and Programming using C	3	0	0	3	ESC-2	Problem Solving and Programming using C	3	0	0	3			
ES1103	Engineering Graphics and Drafting	1	0	3	2.5	ESC-3	Engineering Graphics	2	0	2	3			15
HS1102	Workshop Practice Lab	0	0	3	1.5	ESC-L1	Workshop Practice Lab	0	0	3	1.5			10
BS1103	Engineering Physics Lab	0	0	3	1.5	BSC-L1	Engineering Physics Lab	0	0	3	1.5			10
BS1205	Physics Virtual Lab	0	0	2	0	BSC-L2	Physics Virtual Lab	0	0	2	0			10
ES1104	Problem Solving and Programming using C Lab	0	0	3	1.5	ESC – L2	Problem Solving and Programming using C lab	0	0	3	1.5			10
MC1101	Environmental Science	3	0	0	0	MC -1	Constitution of India(AICTE Mandate Course)	2	0	0	0			
AC	Physical Fitness Activities	2	0	0	0									
TOTAL					19	Total Credits					**19.5**			

Program Code: B.Tech(1A)03

Program Name:B.Tech – MECHANICAL ENGG.　　　　　**Year : I**　　　　　**Semester: II**

R19						R20						Remarks		
Course code	Course name	L	T	P	C	Course code	Course name	L	T	P	C	New Course? (R20)	Deleted Course? (R19)	Content Revision %
BS1201	Mathematics-II	3	0	0	3	BSC-3	Mathematics-II (Linear Algebra and Numerical Methods)	3	0	0	3			15
BS1202	Engineering Chemistry	3	0	0	3	BSC-4	Engineering Chemistry	3	0	0	3			
HS1203	Communicative English	3	0	0	3	HSC-1	Communicative English	3	0	0	3			
ES1201	Basic Electrical & Electronics Engineering	3	0	0	3	ESC-4	Basic Electrical & Electronics Engineering	3	0	0	3			
BS1204	Engineering Chemistry Lab	0	0	3	1.5	ESC-5	Thermodynamics	3	0	0	3			
ES1202	Computer Aided Engineering Drawing	1	0	3	2.5	HSC-L1	English communication Skills Lab	0	0	3	1.5			
BS1205	Basic Electrical Engineering Lab	0	0	3	1.5	BSC-L3	Engineering Chemistry Lab	0	0	3	1.5			
BS1206	Basic Electronics Engineering Lab	0	0	3	1.5	ESC-L3	Basic Electrical& Electronics Engineering Lab	0	0	3	1.5			40
HS1204	English communication skills Lab – I	0	0	2	1	MC-2	Physical Fitness Activities	0	0	2	0			
MC1201	Constitution of India	3	0	0	0	MC-3	Engineering Exploration Project	0	0	1	0			
MC1202	PE&HV	3	0	0	0								YES	
		TOTAL			20		Total Credits				**19.5**		1	1

Program Code: B.Tech(1A)03

Program Name:B.Tech – MECHANICAL ENGG.   **Year : II**   **Semester: I**

R19						R20						Remarks		
Course code	Course name	L	T	P	C	Course code	Course name	L	T	P	C	New Course? (R20)	Deleted Course? (R19)	Content Revision %
BS2101	Mathematics–III(Vectorcalculus,Transformsand PDE)	3	0	0	3	BSC-5	Mathematics-III (Transforms, PDE and Vector Calculus)	3	0	0	3			15
PCC-ME	Mechanics of Solids	2	1	0	3	PCC-1	Mechanics of Solids	3	0	0	3			5
PCC-ME	Materials Science & Engineering	3	0	0	3	PCC-2	Production Technology	3	0	0	3			
PCC-ME	Production Technology	3	0	0	3	PCC-3	Fluid Mechanics & Hydraulic Machines	3	0	0	3			10
PCC-ME	Thermodynamics	2	1	0	3	PCC-4	Kinematics of Machinery	3	0	0	3			
PCC-ME	Machine Drawing	0	0	6	3	PCC-L1	Machine Drawing	0	0	3	1.5			
PCC-Lab1	Materials Testing Lab	0	0	3	1.5	PCC-L2	Production Technology Lab	0	0	3	1.5			5
PCC-Lab2	Production Technology Lab	0	0	3	1.5	PCC-L3	Fluid Mechanics and Hydraulic Machines lab	0	0	3	1.5			
HSS&MS	Advanced Communication skills Lab	0	0	2	1.0	SOC-1	Computer Aided Drafting and Modeling Lab	0	0	4	2			40
PROJ-2101	Socially Relevant Project				0.5	MC-4	Essence of Indian Traditional Knowledge (AICTE Mandate Course)	2	0	0	0	Yes		
TOTAL					22		Total Credits				**21.5**	1		1

Program Code: B.Tech(1A)03

Program Name:B.Tech – MECHANICAL ENGG.   **Year : II**   **Semester: II**

| R19 | | | | | | R20 | | | | | | Remarks | | |
Course code	Course name	L	T	P	C	Course code	Course name	L	T	P	C	New Course? (R20)	Deleted Course? (R19)	Content Revision %
BS	Mathematics – IV (Complex variables and statistical methods)	2	0	0	2	BSC-6	Mathematics-IV (Complex Variables and Statistical Methods)	3	0	0	3			10
PCC-ME	Kinematics of Machinery	3	0	0	3	ESC-6	Materials Science & Engineering	3	0	0	3			5
PCC-ME	Applied Thermodynamics-I	2	1	0	3	PCC-5	Dynamics of Machinery	3	0	0	3			5
PCC-ME	Fluid Mechanics & Hydraulic Machines	3	0	0	3	PCC-6	Thermal Engineering-I	3	0	0	3			10
PCC-ME	Metal Cutting & Machine Tools	2	0	0	2	HSC-2	Managerial Economics & Financial Accounting	3	0	0	3			
PCC-ME	Design of Machine Members-I	2	1	0	3	PCC-L4	Theory of Machines Lab	0	0	3	1.5			
PCC-Lab3	Fluid Mechanics & Hydraulic Machines Lab	0	0	3	1.5	PCC-L5	Thermal Engineering Lab	0	0	3	1.5			
PCC-Lab4	Machine Tools Lab	0	0	3	1.5	ESC-L4	Materials Testing lab	0	0	3	1.5			
DT-PROJ-2201	EngineeringExplorationProject-DesignThinking (15 hours per Semester)	0	0	1	0.5	SOC-2	Numerical Simulation Lab	1	0	2	2	YES	YES	
MC2201	Essence of Indian Traditional Knowledge	3	0	0	0									
	TOTAL				19.5		Total Credits				**21.5**	1	1	0

Program Code: B.Tech(1A)03

Program Name:B.Tech – MECHANICAL ENGG.   **Year : III**   **Semester: I**

R19						R20						Remarks		
Course code	Course name	L	T	P	C	Course code	Course name	L	T	P	C	New Course ? (R20)	Deleted Course ? (R19)	Content Revision %
BS	Mathematics – IV (Complex variables and statistical methods)	2	0	0	2	PCC-7	Thermal Engineering-II	3	0	0	3			
PCC-ME	Kinematics of Machinery	3	0	0	3	PCC-8	Design of Machine Members-I	3	0	0	3			
PCC-ME	Applied Thermodynamics-I	2	1	0	3	PCC-9	Metal Cutting & Machine Tools	3	0	0	3			30
PCC-ME	Fluid Mechanics & Hydraulic Machines	3	0	0	3	OE-1	1. Sustainable Energy Systems 2. Industrial Management 3. Nano Technology	3	0	0	3	YES		
PCC-ME	Metal Cutting &Machi ne Tools	2	0	0	2	PE-1	1. Finite Element Methods 2. Industrial Robotics 3. Advanced Materials 4. Renewable Energy Sources 5. Mechanics of Composites 6. MOOCs (NPTEL/ Swayam) Course (12 Week duration)	3	0	0	3	YES		20
PCC-ME	Design of Machine Members-I	2	1	0	3	PCC-L6	Machine Tools Lab	0	0	3	1.5			

		L	T	P	C			L	T	P	C			
PCC-Lab3	Fluid Mechanics & Hydraulic Machines Lab	0	0	3	1.5	PCC-L7	CAE Lab	0	0	3	1.5			40
PCC-Lab4	Machine Tools Lab	0	0	3	1.5	SOC-3	ADVANCED COMMUNICATION SKILLS LAB	1	0	2	2			
DT-PROJ-2201	EngineeringExplorationProject-DesignThinking (15 hours per Semester)	0	0	1	0.5	MC - 5	Environmental Science	2	0	0	0			
MC2201	Essence of Indian Traditional Knowledge	3	0	0	0		Evaluation of Summer Internship, completed after II B.Tech II Semester				1.5			
TOTAL					19.5		**TOTAL**				21.5	2		2

Program Name:B.Tech – MECHANICAL ENGG.   **Year : III**   **Semester: II**

R19						R20						Remarks		
Course code	Course name	L	T	P	C	Course code	Course name	L	T	P	C	New Course? (R20)	Deleted Course? (R19)	Content Revision %
PCC-ME	Operations Research	3	0	0	3	PCC-10	Heat Transfer	3	0	0	3			
PCC-ME	Heat Transfer	3	0	0	3	PCC-11	Design of Machine Members-II	3	0	0	3			
PCC-ME	Finite Element Methods	3	0	0	3	PCC-12	Introduction Artificial Intelligence and Machine Learning	3	0	0	3	YES		
OE-1	**OPEN ELECTIVE -I:** 1. Green EngineeringSystems 2. OptimizationTechniques 3. OperationsManagement 4. NanoTechnology	3	0	0	3	PE-2	1. Automobile Engineering 2. Smart Manufacturing 3. Advanced Mechanics of Solids 4. Statistical Quality Control 5. Industrial Hydraulics and Pneumatics 6. MOOCs (NPTEL/ Swayam) Course (12 Week duration)	3	0	0	3	YES	YES	
PE-ME2	1. AdditiveManufacturing 2. AutomobileEngineering 3. ControlSystems 4. MOOCs (NPTEL/Swayam) Course (12Week duration)	3	0	0	3	OE-2	1. Industrial Robotics 2. Essentials of Mechanical Engineering 3. Advanced Materials 4. Introduction	3	0	0	3			20

						Automobile Engineering								
PE-ME3	1. MechanicalVibrations 2. Advanced Mechanics ofSolids 3. Production PlanningControl 4. MOOCs (NPTEL/Swayam) Course (12 Week duration)	3	0	0	3	PCC-L8	Heat Transfer Lab	0	0	3	1.5			
PCC-Lab8	Heat Transfer Lab	0	0	3	1.5	PCC-L9	CAD/CAM Lab	0	0	3	1.5			30
PCC-Lab9	CAM & CAE Lab	0	0	3	1.5	PCC-L10	Measurements& Metrology Lab	0	0	3	1.5			
MC-3201	Employability Skills -2	0	0	2	0	SOC-4	Artificial Intelligence and Machine Learning Lab	1	0	2	2	YES	YES	
						MC - 6	Research Methodology	2	0	0	0	YES		
TOTAL					21		**TOTAL**				21.5	2	2	1

Program Code: B.Tech(1A)03

Program Name:B.Tech – MECHANICAL ENGG.   **Year : IV**   **Semester: I**

R19						R20						Remarks		
Course code	Course name	L	T	P	C	Course code	Course name	L	T	P	C	New Course ? (R20)	Deleted Course ? (R19)	Content Revision %
PCC-ME	Mechanical Measurements & Metrology	3	0	0	3	PE-3	1. Mechanical Vibrations 2. Operations Research 3. Unconventional Machining Processes 4. Computational Fluid Dynamics 5. Gas Dynamics and Jet Propulsion 6. MOOCs (NPTEL/Swayam) Course (12 Week duration)	3	0	0	3			20
HSS&MS	Managerial Economics and Financial Accounting	3	0	0	3	PE-4	1. Automation in Manufacturing 2. Power Plant Engineering 3. Tribology 4. Production Planning	3	0	0	3		YES	

							Control 5. Condition Monitoring 6. MOOCs (NPTEL/Swayam) Course (12 Week duration)							
PE-ME4	1. Automation inManufacturing 2. PowerPlantEngineering 3.Tribology 4. ConditionMonitoring 5. MOOCs (NPTEL/Swayam) Course (12Week duration)	3	0	0	3	PE-5	1. Advanced Manufacturing Processes 2. Mechatronics 3. Refrigeration & Air-Conditioning 4. Additive Manufacturing 5. Non Destructive Evaluation 6. MOOCs (NPTEL/Swayam) Course (12 Week duration)	3	0	0	3			20
PE-ME5	1. Advanced ManufacturingProcesses 2. Mechatronics 3. Computational FluidDynamics 4. Noise & Vibrationcontrol 5. MOOCs (NPTEL/Swayam) Course (12Week duration)	3	0	0	3	OE-3	1. Additive manufacturing 2. Mechatronics 3. Finite Element Methods 4. Introduction to AI&ML	3	0	0	3	YES		
OE-2	**OPEN ELECTIVE -II:** 1. Robotics 2. FoundationsofMechanicalEngineering 3. Computational Methods inEngineering 4. MaterialsTechnology	3	0	0	3	OE-4	1. Optimization Techniques 2. Smart Manufacturing 3. Total Quality Management	3	0	0	3	YES (2)	2	

R19						R20				Remarks		
PCC-ME Lab10	Measurements & Metrology Lab	0	0	3	1.5	HSC-3	Universal Human Values 2: Understanding Harmony	3	0	0	3	YES
PCC-ME Lab11	Simulation Lab	0	0	3	1.5	SOC-5	Mechatronics Lab	0	0	4	2	
PROJ-4101	Project-I	0	0	8	2		Evaluation of Summer Internship completed after III B.Tech II Semester				3	
PROJ-4102	Summer Internship				1							
	TOTAL				21		**TOTAL**				23	4	3

Program Code: B.Tech(1A)03

Program Name:B.Tech – MECHANICAL ENGG.   **Year : IV**   **Semester: II**

R19						R20					Remarks		
Course code	Course name	L	T	P	C	Course code	Course name	L	T	P	C	New Course ? (R20)	Deleted Course ? (R19)	Content Revision %
PE-6	1. Non DestructiveEvaluation 2. GasDynamicsandJetPropulsion 3. IndustrialHydraulicsandPneumatics 4. Statistical QualityControl 5. IndustrialSafetyEngineeringviaMOOCs (NPTEL/Swayam) (12 Week MOOCCourse)	3	0	0	3	Major Project	PROJ	Project work*	0	4	16		YES	

		L	T	P	C									
PE-7	1. Mechanics ofComposites 2. Nanomaterials 3. Renewable EnergySources 4. ReliabilityEngineering 5. Product Design and Manufacturing viaMOOCs (NPTEL/Swayam)(12WeekMOOCCourse)	3	0	0	3								YES(3)	
OE-3	**OPEN ELECTIVE -III:** 1. 3D-Printing Technologies 2. SmartMaterials 3. HybridVehicles	3	0	0	3								YES(2)	
PROJ -4201	Project-II	0	0	12	8									
	TOTAL				17		TOTAL			16		6		

TOTAL CREDITS: (R19) I Year (39) II Year (42) III Year (41) IV Year (38) = 160 Credits