SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

(An Autonomous Institute affiliated to CSVTU, Bhilai)

SCHEME OF TEACHING AND EXAMINATION (EFFECTIVE FROM 2020-2021 BATCH)

M. Tech. (Production Engineering)

2nd Semester

S. No.	Board of Study	Subject Code	Subject	Periods per Week			Scheme of Examination Theory / Practical			Total Marks	Credit L+(T+P)/2
				L	T	P	ESE	CT	TA		
1	Mech. Engg.	ME225201	Theory of Metal Cutting	3	2	-	100	20	20	140	4
2	Mech. Engg	ME225202	Industrial Robotics	3	2	-	100	20	20	140	4
3	Mech. Engg	ME225203	Quality Control and Reliability Engineering	3	2	-	100	20	20	140	4
4	Mech. Engg	ME225204	Modeling & Simulation of Manufacturing System	3	2	-	100	20	20	140	4
5	Refer Table –I		Professional Elective-II	3	2	-	100	20	20	140	4
6	Mech. Engg	ME225291	Industrial Robotics Lab	-	-	4	75	-	75	150	2
7	Mech. Engg	ME225292	Modeling & Simulation of Manufacturing System Lab	-	-	4	75	-	75	150	2
Total				15	10	8	650	100	250	1000	24

L- Lecture T- Tutorial

P- Practical, ESE- End Semester Exam

CT- Class Test TA- Teacher's Assessment

Table-II

PROFESSIONAL ELECTIVE II			
S.No.	Board of Study	Subject Code	Subject
1	Mech. Engg.	ME225221	Smart Material & Structure
2	Mech. Engg.	ME225222	Nano-Technology
3	Mech. Engg.	ME225223	Advance Material and Processing
4	Mech. Engg.	ME225224	Organizational Behaviour

Note (1) – 1/4th of total strength of students subject to minimum of twenty students is required to offer an elective in the college in a Particular academic session.

Note (2) – Choice of elective course once made for an examination cannot be changed in future examinations.

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SCHEME OF EXAMINATION AND SYLLABUS

2nd Semester M. Tech. (Production Engineering)

Subject Code ME225201	Theory of Metal Cutting	L = 2	T = 0	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objective	Course Outcomes
1. The course provides students with fundamental knowledge and principles in material removal processes. 2. In this course, the students apply the fundamentals and principles of metal cutting to practical applications through multiple labs using lathes, milling machines, grinding machines, and drill presses, Computer Numerical Control etc. 3. To demonstrate the fundamentals of machining processes and machine tools. 4. To develop knowledge and importance of metal cutting parameters. 5. To develop fundamental knowledge on tool materials, cutting fluids and tool wear mechanisms.	On successful completion of the course, the student will be able to: 1. Understand and analyze the fundamentals of different cutting tool and materials. 2. Understand and analyze Mechanics of metal cutting. 3. Understand and analyze cutting force and its measurements using dynamometers and temperature distribution during metal cutting. 4. Understand and analyze tool wear and tool life-mechanisms and effects. 5. Understand and analyze the Thermal Aspects and selection of cutting fluids and Optimum cutting speed and cost. techniques.

Unit-I **CO1**

Mechanics of Metal Cutting: Geometry of Metal Cutting Process, Chip formation, Chip thickness ratio, radius of chip curvature, cutting speed, feed and depth of cut – Types of chips chip breakers. Orthogonal and Oblique cutting processes – definition, Forces and energy calculations (Merchant's Analysis) – Power consumed – MRR- Effect of Cutting variables on Forces, Force measurement using Dynamometers.

Unit-II **CO2**

Single Point Cutting Tool: Various systems of specifications, single point cutting tool geometry and their inter-relation. Theories of formation of built-up edge and their effect, design of single point contact tools throwaway inserts.

Unit-III

Tool Materials And Their Properties: Characteristics of tool materials, types of tool materials – carbon tool steels, high speed steels, cast alloys, cemented carbides, ceramics, diamonds, SIALON, CBN, UCON, recommended cutting speeds for the above tools, discussion on die steels, air, water, oil hardening of tools

and their applications

Unit- IV **CO4**

Tool Life and Tool Wear: Theories of tool wear – adhesion, abrasive and diffusion wear mechanisms, forms of wear, Tool life criteria and machine ability index Types of sliding contact, real area of contact, laws of friction and nature of frictional force in metal cutting. Effect Tool angle, Economics, cost analysis, mean co-effect of friction.

Unit- V **CO5**

Cutting Temperature: Sources of heat in metal cutting, influence of metal conditions, Temperature distribution, zones, experimental techniques, analytical approach. Use of tool- work thermocouple for determination of temperature. Temperature distribution in Metal Cutting. Cutting fluids: Functions of cutting fluids, types of cutting fluids, properties, selection of cutting fluids. Cutting tool materials: Historical developments, essential properties of cutting tool materials, types, composition and application of various cutting tool materials, selection of cutting tool materials.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Metal Cutting Principles	MC Shaw	---	Oxford and IBH Publications, New Delhi, 1969
2	Fundamentals of Machining	Boothryd/ Edward	---	Tata McGraw Hill
3	Tool Design	David Son / Lacain/ Goud		Tata McGraw Hill

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Fundamentals of Tool Design	Wilson fw		ASTME PHI 2010
2	Technology of Machine Tools	Steve F. Krar, Arthur R. Gill and Peter Smid		Tata McGraw Hill Education (India) Pt. Ltd., 2013

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SCHEME OF EXAMINATION AND SYLLABUS

2nd Semester M. Tech. (Production Engineering)

Subject Code ME225202	Industrial Robotics	L = 2	T = 0	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objective	Course Outcomes
1. To understand the basic concepts associated with the design and Functioning and applications of Robots 2. To study about the drives and sensors used in Robots 3. To learn about analyzing robot kinematics and robot programming	On successful completion of the course, the student will be able to: 1. Explain 3D translation and orientation representation & illustrate the robot arm kinematics and use of Robot Operating System usage. 2. Design / simulate a robot which meets kinematic requirements. 3. Apply localization and mapping aspects of mobile robotics. 4. To understand ROS applications. 5. To understand robot programming Course Content.

Unit-I **CO1**

Introduction: Definitions, Types of Robots, Application of Robots, Representing Position and Orientation, Representing Pose in 2-Dimensions, Representing Pose in 3-Dimensions, Representing Orientation in 3-Dimensions, Combining Translation and Orientation. SLE: Matlab program for translation and orientation.

Unit-II **CO2**

Time and Motion: Trajectories, Smooth One-Dimensional Trajectories, Multi-Dimensional Case, Multi-Segment Trajectories, Interpolation of Orientation in 3D, Cartesian Motion, Time Varying Coordinate Frames, Rotating Coordinate Frame, Incremental Motion, Inertial Navigation Systems. Mobile Robot Vehicles, Mobility, Car-like Mobile Robots, Moving to a Point, Following a Line, Following a Path, Moving to a Pose. SLE: Flying Robots.

Unit-III **CO3**

Navigation: Reactive Navigation, Braitenberg Vehicles, Simple Automata, Map-Based Planning, Distance Transform, D*, Voronoi Roadmap Method, Probabilistic Roadmap Method, M.Tech - Industrial Automation & Robotics Department of Mechanical Engineering, NIE, Mysuru Page 36 Localization, Dead Reckoning, Modeling the Vehicle, Estimating Pose, Using a Map, Creating a Map, Localization and Mapping, Monte-Carlo Localization. SLE: Matlab programming of localization.

Unit- IV **CO4**

Robot Arm Kinematics: Describing a Robot Arm, Forward Kinematics, A 2-Link Robot, A 6- Axis Robot,

Inverse Kinematics, Closed-Form Solution, Numerical Solution, Under-Actuated Manipulator, Redundant Manipulator, Trajectories, Joint-Space Motion, Cartesian Motion, Motion through a Singularity. SLE: Joint Angle Offsets, Determining Denavit-Hartenberg Parameter.

Unit- V **CO5**

Getting Started with ROS: Installing ROS, Understanding the ROS Filesystem level, Packages, Stacks, Messages, Services, Understanding the ROS Computation Graph level, Nodes, Topics, Services, Messages, Bags, Master, Parameter Server, Creating workspace, Creating & Building an ROS package, Creating & Building the node, Visualization of images, Working with stereo vision, 3D visualization, Visualizing data on a 3D world using rviz. SLE: Saving and playing back data in ROS.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Robotics, Vision and Control: Fundamental Algorithms in MATLAB	Peter Corke		Springer Tracts in Advanced Robotics, Volume 73, 2011
2	Learning ROS for Robotics Programming	Aaron Martinez & Enrique Fernández		Packt Publishing, September 2013

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Robotics for Engineers.	Yoram Koren,	1st edition, 1985.HMT	McGraw Hill International,
2	Industrial Robotics	Groover, Weiss, Nagel,	2nd edition, 2012.	McGraw Hill International,
3	Robotics, control vision and intelligence.	Fu, Lee and Gonzalez	2nd edition, 2007	McGraw Hill International
4	Introduction to Robotics	John J. Craig,	Publishing, 3rd edition, 2010	Addison Wesley

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SCHEME OF EXAMINATION AND SYLLABUS

2nd Semester M. Tech. (Production Engineering)

Subject Code ME225203	Quality Control and Reliability Engineering	L = 2	T = 0	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objective	Course Outcomes
1. Demonstrate the approaches and techniques to assess and improve process and/or product quality and reliability. 2. Introduce the principles and techniques of Statistical Quality Control and their practical uses in product and/or process design and monitoring 3. Illustrate the basic concepts and techniques of modern reliability engineering tools.	On successful completion of the course, the student will be able to: 1. Attain the basic techniques of quality improvement, fundamental knowledge of statistics and probability 2. Use control charts to analyze for improving the process quality. 3. Describe different sampling plans 4. Acquire basic knowledge of total quality management 5. Understand the concepts of reliability and maintainability

Unit-I **CO1**

Basic Concepts: Definitions of quality, Quality of design, Quality of conformance, and Quality of performance, Dimensions of quality, Quality characteristics, Quality control, Statistical quality control and cost of quality.

Fundamentals of Probability and Statistics: Events, Sample space, Probability rules, Dependent and Independent events, Statistical tools in quality control, Concept of variation, Graphical tools for data representation and analysis, Discrete and continuous probability distributions and their applications in quality control, numerical problems.

Unit-II **CO2**

Control charts for Variables: Variation, Causes of variation, Objectives of control charts, Choice of variable, Subgroup size and subgrouping, frequency of sampling, control limits. Process capability analysis, Relationship of a process in control to specification limits, Variable charts - X bar chart, R chart, σ chart, revision of control limits and RPI, Introduction to cusum chart and moving range charts, numerical problems.

Unit-III **CO3**

Control charts for Attributes: Control charts for fraction nonconforming (p chart, np chart) and nonconformities (c chart and u chart) with variable and constant sample size, Choice between variables and

attributes control charts, revision of control limits, numerical problems.

Failure Data Analysis: Introduction, Failure Data, Quantitative measures, MTTF, MTBF, Bathtub Curve, Mean Life, Life Testing, numerical problems, Introduction to Failure Mode and Effect Analysis.

Unit- IV **CO4**

Acceptance Sampling: Fundamentals of acceptance sampling, Sampling methods, OC Curves and their characteristics, AQL, IQL, LTPD, AOQ/AOQL. Types of acceptance sampling-Single, Double, Multiple, and Sequential sampling plans, Average Total Inspection, comparison amongst sampling plans, numerical problems.

Unit- V **CO5**

System Reliability: Definition, Series, parallel and mixed configuration, Block diagram concept, r-out-of-n structure solving problems using mathematical models. Difficulty in achieving reliability, Methods for improving reliability during design, Different techniques available to improve reliability, Reliability-Cost trade off, Prediction and Analysis, numerical problems.

Maintainability and Availability: Introduction, Techniques available to improve maintainability and availability, trade-off among reliability, maintainability and availability, Simple problem.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Statistical Process Control	Eugene Grant, Richard Leavenworth	-	McGraw Hill
2	Quality Engineering in Production Systems	G Taguchi	1989	McGraw Hil
3	Optimization &Variation Reduction in Quality	W.A. Taylor	1991	Tata McGraw Hill

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	. Jurans Quality Planning and Analysis	Frank. M.Gryna Jr	-	McGrawHill
2	Reliability Engineering	LS Srinath	3rdEdition, 1991	Affiliated East West Pvt Ltd

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SCHEME OF EXAMINATION AND SYLLABUS

2nd Semester M. Tech. (Production Engineering)

Subject Code ME225204	Modeling & Simulation of Manufacturing System	L = 2	T = 0	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objective	Course Outcomes
1. Define the basics of simulation modeling and replicating the practical situations in organizations 2. Generate random numbers and random variates using different techniques. 3. Develop simulation model using heuristic methods. 4. Analysis of Simulation models using input analyzer, and output analyzer 5. Explain Verification and Validation of simulation model.	On successful completion of the course, the student will be able to: 1. Describe the role of important elements of discrete event simulation and modeling paradigm. 2. Conceptualize real world situations related to systems development decisions, originating from source requirements and goals. 3. Develop skills to apply simulation software to construct and execute goal-driven system models. 4. Interpret the model and apply the results to resolve critical issues in a real-world environment. 5. Understand the Empirical Discrete Distribution, Design and Evaluation of Simulation Experiments.

Unit-I **CO1**

Principle of Computer Modelling and Simulation: Monte Carlo simulation. Nature of computer-modeling and simulation. Limitations of simulation, areas of applications. System and Environment: Components of a system -discrete and continuous systems, Models of a system -a variety of modeling approaches. Simulation Software: Selection of simulation software, simulation packages.

Unit-II **CO2**

Discrete Event Simulation: Concepts in discrete event simulation, manual simulation using event scheduling, single channel queue, too server queue, simulation of inventory problem. Statistical Models in Simulation: Discrete distributions, continuous distributions.

Unit-III **CO3**

Random Number Generation: Techniques for generating random numbers- Mid square method -the mod product method -Constant multiplier technique -Additive congruential method -Linear congruential method -Tests for random numbers -The Kolmogorov Smimov test -the Chi-square test, Ivica Cmkovic, Ulfaskluna

and Annitaborsen Dohlgvist Publisher Artechhouse.

Unit- IV **CO4**

Random Variable Generation: Inversion transforms technique exponential distribution. uniform distribution, Weibul distribution, continuous distribution, generating approximate normal variates-Erlang distribution.

Unit- V **CO5**

Empirical Discrete Distribution: Discrete uniform -distribution Poisson distribution -geometric distribution -acceptance -rejection technique for Poisson distribution gamma distribution. Design and Evaluation of Simulation Experiments: variance reduction techniques antithetic variables, variables-verification and validation of simulation models.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Discrete Event System Simulation‖	J.Banks, J.S. Carson, B. L. Nelson and D.M. Nicol	2009	PHI, New Delhi
2	Simulation Modeling and Analysis‖,	A.M. Law and W.D.Kelton,	2008	Tata McGraw Hill Ltd, New Delhi

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Performance Modeling of Automated Manufacturing Systems	N. Viswanadham and Y. Narahari,	2007	PHI, New Delhi
2	Simulation Principles & Methods	Gray Beal, Wajne J and Pooch U W,	-	Winthrop Publishing Incorporate
3	Discrete Event System Simulation	Banks, Carson, Nelson and Nicole	2001	Pearson Education, Asia

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SCHEME OF EXAMINATION AND SYLLABUS

2nd Semester M. Tech. (Production Engineering)

Subject Code ME225221	Smart Material & Structure	L = 2	T = 0	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objective	Course Outcomes
1. Main objective of this course is to teach students to model different types of smart materials and to design simple smart structures. 2. The students will learn smart structures containing smart material-based sensors, actuators to perform functions like monitoring the health and/or performance the structure, and changing the shape or mechanical properties of the structure. 3. Students will be able to apply the techniques learned in this class to produce solutions to industrial problems using smart structures and materials. 4. The course will also help to build the necessary foundation for the students to conduct research in the areas of smart materials and smart structures.	On successful completion of the course, the student will be able to: 1. Students will learn how to model electro-mechanical behavior of piezoelectric materials. 2. Students will learn physical mechanism that causes piezoelectric material behavior. 3. Students will learn shape memory alloy based actuators. 4. Students will be familiar with practical smart structures with shape memory alloy components. 5. Students will learn how to model simple structures with integrated piezoelectric sensors and actuators.

Unit-I **CO1**

Overview of Smart Materials, Structures and Products Technologies. Smart Materials (Physical Properties) Piezoelectric Materials, Electro strictive Materials, Magneto strictive Materials, Magnetoelectric Materials. Magnetorheological Fluids, Electrorheological Fluids, Shape Memory Materials, Fiber-Optic Sensors.

Unit-II **CO2**

Smart Sensor, Actuator and Transducer Technologies: Smart Sensors: Accelerometers; Force Sensors; Load Cells; Torque Sensors; Pressure Sensors; Microphones; Impact Hammers; MEMS Sensors; Sensor Arrays Smart Actuators: Displacement Actuators; Force Actuators; Power Actuators; Vibration Dampers; Shakers; Fluidic Pumps; Motors Smart Transducers: Ultrasonic Transducers; Sonic Transducers.

Unit-III **CO3**

Measurement, Signal Processing, Drive and control Techniques Quasi-Static and Dynamic Measurement Methods; Signal Conditioning Devices; Constant Voltage, Constant Current and Pulse Drive Methods;

Calibration Methods; Structural Dynamics and Identification Techniques; Passive, Semi-Active and Active Control; Feedback and Feed forward Control Strategies.

Unit- IV **CO4**

Design, Analysis, Manufacturing: Case studies incorporating design, analysis, manufacturing and application issues involved in integrating smart materials and devices with signal processing and control capabilities to engineering smart structures and products.

Unit- V **CO4**

Applications of Engineering Smart Structures and Products Emphasis on structures, automation and precision manufacturing equipment, automotive, consumer products, sporting products, computer and telecommunications products, as well as medical and dental tools and equipment.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Smart Materials and Structures -	M. V. Gandhi and B.	1992 (ISBN: 0412370107).	So Thompson - Chapman & Hall, London; New York -
2	Smart Structures and Materials	B. Cui shaw	1996 (ISBN0890066817).	Artech House, Boston, -

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Handbook of Giant Magnetostrictive Materials	G. Engdahl	2000 (ISBN: 012238640X).	Academic Press, SanDiego, Calif.; London
2	Shape Memory Materials	K. Otsuka and C. M. Wayman -	1998(ISBN: 052144487X).	Cambridge UniversityPress, Cambridge; New York
3	Fiber Optic Sensors: An Introduction for Engineers and Scientists	Eric Udd	1991	JohnWiley & Sons, New York

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SCHEME OF EXAMINATION AND SYLLABUS

2nd Semester M. Tech. (Production Engineering)

Subject Code ME225222	Nano-Technology	L = 2	T = 0	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objective	Course Outcomes
1. Know the types of nanotechnology, atomic structure, molecular technology and preparation of nano materials. 2. Understand the fundamentals of nano electronics and its properties. 3. Know the Silicon MOSFET's, QTD and carbon nano tubes. 4. Understand the fundamentals of molecular electronics 5. Make them understand the fabrication of nanostructures for advanced devices	At the end of the course the student will be able 1. Explain the fundamental principles of nanotechnology and their application to biomedical engineering. 2. Apply engineering and physics concepts to the nano-scale and non-continuum domain. 3. Identify and compare state-of-the-art nanofabrication methods and perform a critical analysis of the research literature. 4. Design processing conditions to engineer functional nano materials. 5. Evaluate current constraints, such as regulatory, ethical, political, social and economic, encountered when solving problems in living systems

Unit-I **CO51**

Metal Based Nanocomposites: Metal-Oxide or Metal-Ceramic composites, Different aspects of their preparation techniques and their final properties and functionality. Metalmetal nanocomposites, some simple preparation techniques and their new electrical and magnetic properties.

Unit-II **CO2**

Design Of Super Hard Materials: Super hard nano composites, its designing and improvements of mechanical properties.

Unit-III **CO3**

Mechanics Of Polymer Nanocomposites: Interfacial adhesion and characterization, factors influencing the performance of nano composites, physical and functional properties.

Unit- V **CO5**

Characterization Of Polymer Nanotubes Based Composites: Mechanical, Electrical and Thermal

Properties and their applications - Polymer / nanofillers (metallic nano powders) systems, Rheological measurements, processing characteristics.

Testing Of Nanocomposites: Thermal analysis such as TGA, TMA, DSC, DMTA Biggest Obstacle to Business Breakthrough, Integration of Ideas.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	"Nanophysics and Nanotechnology -An Introduction to Modern Concepts in Nano science"	Edward L. Wolf	2006	Second Edition, John Wiley & Sons,
2	Surface Science: Foundations of Catalysis and Nano science.	K.W. Kolasinski	2002	Wiley

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Nanoparticulates as Drug Carriers	Vladimir P. Torchilin	2006	Imperial CollegePress
2	Nanotechnology–Basic Science & Emerging Technologies	Chapman & Hall	2002	CRC
3	Nanomaterials and Nano systems for BiomedicalApplications,	M Reza Mozafari	2007	Springer

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SCHEME OF EXAMINATION AND SYLLABUS

2nd Semester M. Tech. (Production Engineering)

Subject Code ME225223	Advance Material and Processing	L = 2	T = 0	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objective	Course Outcomes
1. Understand the manufacturing processes including stir casting, tape castingprocess and high energy rate forming. 2. Identify suitable hybrid welding process for welding a given material. 3. Explain the working principle of Electron beam, laser beam and laser hybrid welding processes and suggest their applications. 4. Apply advanced casting methods including V-process, lost foam process and Magnetic molding process for ceramics and composite materials. 5. Apply friction and friction stir welding processes to weld difficult-to-weld materials	On successful completion of the course, the student will be able to: 1. Classify materials and physical characteristics. 2. Understand iron carbon equilibrium diagram, TTT diagram, heat treatment process of various steels. 3. Understand alloys of various nonferrous metals. 4. Understand polymers, ceramics and their mechanical – thermal properties. 5. Identify the composites and their structure and Understand applications of ceramics.

Unit-I **CO51**

Classification and characteristics: Metals, Ceramics, Polymers and composites. General properties and structure: Atoms, molecules bonds in solids, Crystalline - Defects in Metallic structure, Dislocations and plastic deformation - Strengthening mechanism - grain size, dislocation - Cold work, precipitation hardening, dispersion hardening - phase reactions, fatigue and Creep behavior.

Unit-II **CO2**

Ferrous Alloys: Iron carbon equilibrium diagrams - Steels and cast irons - properties, structure, composition and applications transformation hardening in steels - TIT diagrams - Heat treatment processes - Effect of alloying elements - High alloy steels, Stainless steel types, tool Steels, Manganese steels, heat resistant steels, HSLA, Maraging steels.

Unit-III **CO3**

Non-Ferrous alloys: Alloy's of copper, Aluminum, nickel, magnesium, titanium, lead, tin, Zinc - composition, heat treatment, structure, properties and application.

Unit- IV **CO4**

Polymers and polymerizations: Structure and properties of thermoplastics and thermo sets – Engineering

Applications - property modifications - Mechanical and thermal behavior – processing methods. Ceramics : Nature and structure of Ceramics - Refractory Abrasives glasses - glass ceramics - Advanced ceramics processing methods.

Unit- V **CO5**

Composites: Definition - classification and characteristics of composite materials - Volume fraction - laminated composites particulate composites, fibrous composites - Types of reinforcements, their shape and size - production and properties of fiber reinforced plastics, Metal Matrix composites and ceramic matrix composites - Applications. Processing of Polymers: composites, ceramics - thermal spraying - Ion beam machining diamond coating techniques-tribological Applications.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Engineering Metallurgy	Raymond and Higgens	--	ELBS/EA
2	Introduction to Material Science and Engineering	James.F.Shackleford	7th edition	Mc MillaNY
3	Powder Metallurgy	,-	-Vol.7	Metals Hand Book ASM, USA

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SCHEME OF EXAMINATION AND SYLLABUS

2nd Semester M. Tech. (Production Engineering)

Subject Code ME225224	Organizational Behaviour	L = 2	T = 0	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objective	Course Outcomes
1. To learn the basic concepts of Organizational Behaviour and its applications in contemporary organizations. 2. To understand how individual, groups and structure have impacts on the organizational effectiveness and efficiency. 3. To appreciate the theories and models of organizations in the workplace. 4. To creatively and innovatively engage in solving organizational challenges. 5. To learn and appreciate different cultures and diversity in the workplace.	At the end of the course the student will be able to: 1. Define organizational behaviour, analyze discipline and area of application in business. 2. Understand personality, interpersonal and intergroup behaviour. 3. Understand group types, norms and decision making. 4. Understand nature and development of leadership and types of power. 5. Learn the management of conflict, development, effectiveness and cross-cultural management.

Unit-I **CO51**

Organizational Behavior: Definition, need for studying Organizational Behavior, Disciplines involved in the study of Organizational Behavior, -Contributing disciplines and area like psychology, social psychology, economics, anthropology etc. Application of Organizational Behavior in Business.

Unit-II **CO2**

Individual behaviour: Personality, perception, learning, attitudes inter-personal behaviour – Group and inter-group behaviour.

Unit-III **CO3**

Group Dynamics: Formal and Informal Group, Group Norms, Group Cohesiveness, Group Behaviour and Group Decision – making

Unit- IV **CO4**

Motivation and morale, leadership-nature, styles and approaches, development of leadership including laboratory training. Power and Authority – Definition of Power – Types of Power.

Unit- V **CO5**

Management of change, Conflict Management, Organisation Health, Development and Effectiveness. Management of culture, Cross Cultural Management.

		October 2020	1.00	Applicable for AY 2020-21 Onwards
Chairman (AC)	Chairman (BoS)	Date of Release	Version	

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Organizational Behaviour	Nelson & Quick,		Cengage learning
2	Organizational Behaviour	S. Fayyaz Ahamed and others		Atlantic publisher

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Understanding Organizational Behavior	Pareek. U	2nd ed.	Oxford University Press
2	Human behavior at work	Newstrom J. W., & Davis, K	12th ed.	Tata McGraw Hill

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SCHEME OF EXAMINATION AND SYLLABUS

2nd Semester M. Tech. (Production Engineering)

Subject Code ME225291	Industrial Robotics Lab	L = 2	T = 0	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	75	-	75	150	3 Hours

Course Objective	Course Outcomes
1. Learn about the types of robots used in material handling systems. 2. Understand the use of vision systems in automation systems. 3. Gain knowledge on the different methods of material handling	On successful completion of the course, the student will be able to: 1. Differentiate the various types of Industrial Robots and their architecture. 2. Apply the concepts of image processing for robotic inspection systems. 3. Analyze the applications of robots in various industrial application. 4. Design and fabricate simple grippers for pick and place application. 5. Identify the right Robot for a given industrial application.

List of Experiments

1. ASSIGNMENT ON INTRODUCTION TO ROBOT CONFIGURATION
2. DEMONSTRATION OF ROBOT WITH 2 DOF, 3 DOF, 4 DOF ETC.
3. TWO ASSIGNMENTS ON PROGRAMMING THE ROBOT FOR APPLICATIONS
4. TWO PROGRAMMING EXERCISES FOR ROBOTS
5. TWO CASE STUDIES OF APPLICATIONS IN INDUSTRY
6. EXERCISE ON ROBOTIC SIMULATION SOFTWARE

		October 2020	1.00	Applicable for AY 2020-21 Onwards
Chairman (AC)	Chairman (BoS)	Date of Release	Version	

Shri Shankaracharya Technical Campus,

Shri Shankaracharya Group of Institutions

(An Autonomous Institute affiliated to Chhattisgarh Swami Vivekanand Technical University Bhilai)

SCHEME OF EXAMINATION AND SYLLABUS

2nd Semester M. Tech. (Production Engineering)

Subject Code ME225292	Modeling & Simulation of Manufacturing System Lab	L = 2	T = 0	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	75	-	75	150	3 Hours

Course Objective	Course Outcomes
Course Objectives: 1. To give exposure to software tools needed to analyse engineering problems. 2. Expose the students to different applications of simulation and analysis tools 3. To impart the fundamental knowledge on using various analytical tools like ANSYS, FLUENT, etc., for Engineering Simulation. 4. To know various fields of engineering where these tools can be effectively used to improve the output of a product. 5. To impart knowledge on how these tools are ued in Industries by solving some real time problems using these tools..	On successful completion of the course, the student will be able to: 1. The student will be able to appreciate the utility of the tools like ANSYS or FLUENT in solving real time problems and day to day problems. 2. Use of these tools for any engineering and real time applications. 3. Acquire knowledge on utilizing these tools for a better project in their curriculum as well as they will be prepared to handle industry problems with confidence when it matters to use these tools in their employment.

List of Experiments

1. DRAFTING : Development of part drawings for various components in the form of orthographic andisometric. representation of dimensioning and tolerances scanning and plotting. study of script, DXE and IGES files.
2. PART MODELING : Generation of various 3D models through protrusion, revolve, shell sweep. creation of various features. study of parent child relation. feature based and boolean based modeling surface and assembly modeling. study of various standard translators. design simple components.
3. a) Determination of deflection and stresses in 2D and 3D trusses and beams.
   b) Determination of deflections component and principal and Von-mises stresses in plane stress, plane
strain and Axisymmetric components.
   c) Determination of stresses in 3D and shell structures (at least one example in each case)
   d) Estimation of natural frequencies and mode shapes, Harmonic response of 2D beam.
   e) Steady state heat transfer Analysis of plane and Axisymmetric components.
4. a) Development of process sheets for various components based on tooling Machines.
   b) Development of manufacturing and tool management systems.
   c) Study of various post processors used in NC Machines.

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d) Development of NC code for free form and sculptured surfaces using CAM packages.

e) Machining of simple components on NC lathe and Mill by transferring NC Code / from a CAM package.

f) Quality Control and inspection.

Packages to be provided to cater to drafting, modeling & analysis from the following:
Auto CAD, Micro Station, CATIA, Pro-E, I-DEAS, ANSYS, NISA, CAEFEM, Gibbs CAM, Master