

PROGRAMME GUIDE

MASTER OF TECHNOLOGY (PRODUCTION ENGINEERING) (M.Tech PE)

***Scheme of Examination (CBCS/ELECTIVE)**

***Detailed Structure of Syllabus**



DR. C.V.RAMAN UNIVERSITY
KARGI ROAD, KOTA, BILASPUR, CHATTISGARH(C.G.)
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MASTER OF TECHNOLOGY

Duration: 24 Months (2 Years)

Eligibility: BE / B.Tech in a Related Field with Qualified Marks

COURSE STRUCTURE OF M.TECH :- PRODUCTION ENGINEERING SEMESTER Ist													
Course Details				External Assessment		Internal Assessment				Credit Distribution			Allotted Credits
Course Code	Course Type	Course Title	Total Marks	Major		Minor		Sessional ***		L	T	P	Subject wise Distribution
				Max Marks	Min Marks	Max Marks	Min Marks	Max Marks	Min Marks				
Theory Group													
6TMMA 101	Core-1	Advanced Mathematics	100	50	17	20	07	30	15	2	1	0	3
6TMPE 102	Core-2	Advanced in Mfg. Technology	100	50	17	20	07	30	15	2	1	0	3
6TMPE 103	Core-3	Comp. Integrated Manufacturing	100	50	17	20	07	30	15	2	1	0	3
6TMPE 104	Core-4	Computer aided Process Planning	100	50	17	20	07	30	15	2	1	0	3
6TMPE 105	Core-5	Mfg Automation and Mechatronics	100	50	17	20	07	30	15	2	1	0	3
6TMST 106	Program Elective-1	Audit Course-I 1.English for research paper writing 2.Pedogogy studies 3. Stress management by Yoga	-	-	-	-	-	-	-	-	-	-	-
Practical Group				Term End Practical Exam				Sessional					
6TMPE 106	Core	Lab -I(Advanced in Mfg. Technology)	50	25	12			25	12	0	0	1	1
6TMPE 107	Core	Lab-II(Comp. Integrated Manufacturing)	50	25	12			25	12	0	0	1	1
Grand Total			600							10	5	2	17


Minimum Passing Marks are equivalent to Grade D


L- Lectures T- Tutorials P- Practical


Major- Term End Theory / Practical Exam

Minor- Pre University Test

Sessional weightage – Attendance 50%, Three Class Tests/ Lab Performance Assignment 50%


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COURSE STRUCTURE OF M.TECH :- PRODUCTION ENGINEERING SEMESTER IIInd

COURSE STRUCTURE OF M.TECH :- PRODUCTION ENGINEERING SEMESTER IInd													
Course Details				External Assessment		Internal Assessment				Credit Distribution			Allotted Credits
Course Code	Course Type	Course Title	Total Marks	Major		Minor		Sessional ***		L	T	P	Subject wise Distribution
				Max Marks	Min Marks	Max Marks	Min Marks	Max Marks	Min Marks				
Theory Group													
6TMPE 201	Core-6	Supply Chain Management	100	50	17	20	07	30	15	2	1	0	3
6TMPE 202	Core-7	FMS AND FEA	100	50	17	20	07	30	15	2	1	0	3
6TMPE 203	Core-8	Operation Management	100	50	17	20	07	30	15	2	1	0	3
6TMPE 204	Core-9	Robotics and Automated Material Handling	100	50	17	20	07	30	15	2	1	0	3
6TMPE 205	Core-10	Reliability and Total Productive Maintenance	100	50	17	20	07	30	15	2	1	0	3
6TMST 206	Program Elective-2	Audit Course-II 1. Disaster management 2. Personality Development through life enlightenment skills 3. Value addition	-	-	-	-	-	-	-	-	-	-	-
Practical Group				Term End Practical Exam				Sessional					
6TMPE 206	Core	Lab –III (FMS AND FEA)	50	25	12			25	12	0	0	1	1
6TMPE 207	Core	Lab-IV (Part drawing and design)	50	25	12			25	12	0	0	1	1
Grand Total			600							10	5	2	17

Minimum Passing Marks are equivalent to Grade D


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COURSE STRUCTURE OF M.TECH :- PRODUCTION ENGINEERING SEMESTER IIIrd													
Course Details				External Assessment		Internal Assessment				Credit Distribution			Allotted Credits
Course Code	Course Type	Course Title	Total Marks	Major		Minor		Sessional ***		L	T	P	Subject wise Distribution
				Max Marks	Min Marks	Max Marks	Min Marks	Max Marks	Min Marks				
Theory Group													
6TMPE 301(A)	Program Elective-3	Elective I	100	50	17	20	07	30	15	2	1	0	3
6TMPE 302(B)	Program Elective-4	Elective II	100	50	17	20	07	30	15	2	1	0	3
Practical Group				Term End Practical Exam				Sessional					
6TMPE 303	Seminar	Seminar	100	50	25			50	25	0	0	1	1
6TMPE 304	Dissertation	Dissertation Part I (Literature review/Problem Formulation/Synopsis)	200	120	60			80	40	0	0	10	10
Grand Total			500							4	2	11	17

Minimum Passing Marks are equivalent to Grade D

Major- Term End Theory / Practical Exam

Minor- Pre University Test

Sessional weightage – Attendance 50%,

Three Class Tests/ Lab Performance Assignment 50%

L- Lectures T- Tutorials P- Practical

ELECTIVE I

A) CNC Machines
B) MIS and ERP

ELECTIVE –II

A) Flexible Competitive Mfg. System
B) Total Quality Management
C) CI Process Inventory System

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COURSE STRUCTURE OF M.TECH :- PRODUCTION ENGINEERING SEMESTER IVth													
Course Details				External Assessment		Internal Assessment				Credit Distribution			Allotted Credits
Course Code	Course Type	Course Title	Total Marks	Major		Minor		Sessional ***		L	T	P	Subject wise Distribution
				Max Marks	Min Marks	Max Marks	Min Marks	Max Marks	Min Marks				
Practical Group				Term End Practical Exam				Sessional					
6TMPE 401	Dissertation	Dissertation Part-II	500	300	150			200	100	0	0	17	17
Grand Total			500							0	0	17	17

Minimum Passing Marks are equivalent to Grade D

Major- Term End Theory / Practical Exam

Minor- Pre University Test

Sessional weightage – Attendance 50%,

Three Class Tests/ Lab Performance Assignment 50%

L- Lectures T- Tutorials P- Practical

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SEMESTER- 1st
Course: M. Tech (Production)
SUBJECT: Advanced Mathematics

Subject Code: 6TMMA 101
Theory Max. Marks: 50
Theory Min. Marks: 17

COURSE OBJECTIVE:

The general objective of the course is to introduce-

- The concept of Tensor analysis and their applications in engineering.
- The concept of calculus of variation of functions (one and several variables) and their applications.
- The concept of numerical solution of partial differential equations.
- The concept of conformal mapping and the applications of complex analysis.

Syllabus:

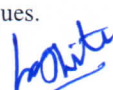
Unit	Unit wise course contents	Methodology Adopted
Unit – I	Linear Algebra: Linear transformation, vector spaces, hash function, Hermite polynomial, Heavisite's unit function and error function. Elementary concepts of Modular mathematics	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Solution of Partial Differential Equation (PDE) by separation of variable method, numerical solution of PDE (Laplace, Poisson's, Parabolic) using finite difference methods, Elementary properties of FT, DFT, WFT, Wavelet transform, Haar transform.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Probability, compound probability and discrete random variable, Binomial, Normal and Poisson's distributions, Sampling distribution, elementary concept of estimation and theory of hypothesis, recurred relations.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Stochastic process, Markov process transition probability transition probability matrix, just and higher order Markov process, Application of Eigen value problems in Markov Process, Markov chain. Queuing system, transient and steady state, traffic intensity, distribution queuing system, concepts of queuing models (M/M/1: Infinity/ Infinity/ FC fS), (M/M/1: N/ Infinity/ FC FS), (M/M/S: Infinity/ Infinity/ FC FS)	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	FEM: Variational functionals, Euler Lagrange's equation, Variational forms, Ritz method, Galerkin's method, descretization, finite elements method for one dimensional problems.	Usage of ICT like PPT, Video Lectures, Black board.

Course outcomes:

- Students will be able to analyze and develop the mathematical model of thermal system.
- Student should able analyze the reliability and maintainability of the series and parallel thermal system.
- Students will be able to solve differential equations using numerical techniques.

Text Books:

- Higher Engineering Mathematics H. K. Dass S. Chand
- Advanced Mathematics Dr. Riyaz Ahmad Khan S. Chand
- Higher Engineering Mathematics B.V. Ramana TMH
- Engineering Mathematics B K Pal & K Dass U N Dhur & Sons Priv Ltd
- Advanced Engineering Mathematics RR Singh & Mukul Bhatt TMH


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- Higher Engineering Mathematics B. S. Grewal Khanna

Reference Books:

- Advance Engineering Mathematics Md. Ismail & Hessein Noor Pub.
- Advance Engineering Mathematics, O'Neil, Cengage Thomson
- Advance Mathematics for Engg Spiegel, Schaum Series TMH
- Advance Engineering Mathematics Ervin Kreszig, Wiley Eastern Edd.
- Engineering Mathematics Vol 2 Baburam Pearson
- Elementary Differential Equations W. E. Boyce and R. DiPrima John Wiley
- Fourier series and boundary value problems, R. V. Churchill and J. W. Brown McGraw-Hill

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
	Able to provide knowledge about calculus and partial differentiation.	Goal04 (quality education)	

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SEMESTER- 1st

Course: M. Tech (Production)

SUBJECT: Advances in Manufacturing Technology

Subject Code: 6TMPE 102

Theory Max. Marks: 50

Theory Min. Marks: 17

COURSE OBJECTIVE:

- To understand the basic laws of physics and their applications in engineering and technology.
- To develop scientific temper and analytical capability.
- To solve various engineering problems.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Metal cutting and tool materials: Orthogonal and oblique cutting -Types of tool wear, Abrasion, Diffusion, Oxidation, Fatigue and Adhesive wear - Prediction of tool life - Monitoring of tool wear, Cutting forces and vibration - Tool materials, cemented carbide, Coated carbide, Cermet, Ceramic, CBN and PCD - Selection of machine parameters and Tools.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Special machining: Deep hole drilling - Gun drills - Gun boring - Trepanning - Honing - Lapping - Super finishing - Burnishing - Broaching - High speed machining.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Unconventional machining: Principles, processes, Various influencing parameters and Applications of - Ultrasonic machining, Electro Discharge Machining, Electro Chemical Machining, Electron and Laser Beam Machining, Plasma Arc Machining and Water Jet Machining.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Rapid prototyping: Stereo lithography - Laminated object manufacturing - selective laser sintering - solid freeform - Vacuum casting - Resin injection - Applications of RPT - Surface roughness terms - Influence of machining parameters on surface roughness - Micro finishing process.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Artificial intelligence and expert systems: Introduction - Pattern recognition - Control strategies - Heuristic search, Forward and Backward reasoning - Search algorithms - Game playing - Knowledge representation - structural representation of knowledge -Expert systems in manufacturing.	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcomes:-

After successfully completing this course, you should be able to demonstrate:

- An appropriate degree of competency in the evaluation of various additive and rapid manufacturing technologies and their application in modern manufacturing processes.
- Appropriate levels of understanding of the principles of additive manufacturing from CAD design to part manufacture, particularly in-so-far as how that understanding is used in practical applications.
- Competency in specification and use of materials, both metal and polymer, in additive manufacturing processes.

Text Books:

- Theory of metal cutting Battacharya, NCB Agency
- Modern Manufacturing Processes Pandey P.S. and Shah N. Pearson
- Cutting tools for Productive Machining Sadasivan T.A. And Sarathy D. Widia Publication.

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- CAD/CAM: Theory & Practice, Ibrahim Zeid, R Sivasubrahmanian McGraw Hill
- Introduction to Micromachining Jain V.K. Narosa publishers
- Manufacturing Science A. Ghosh and A.K. Mallik Affiliated East-West Press Pvt. Ltd. New Delhi.

Reference Books:

- The Lithographic handbook Durvent WR, Narosa Publishers
- The machining of metals Armarego E.J.A. And Brown RH. Prentice Hall
- Artificial Intelligence Rich E. and Knight K TMH
- Developments in high speed metal forming Davies K and Austin E.R, The Machinery Publishing Co
- Programmable logic controllers Petruzella Frank. D. McGraw Hill
- Computer control of manufacturing systems Yoram Koren TMH
- Nontraditional Manufacturing Processes G.F.Benedict, Marcel Dekker, Inc. New York

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
R&D works, Production Manager,	Skilled with various advanced techniques of manufacturing processes.	Goal09(Industry, innovation and infrastructure) Goal08(Decent work and economic growth)	popular technical approach for analyzing and designing an application, system, or business

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SEMESTER- 1st
Course: M. Tech (Production)
SUBJECT: Computer Integrated Manufacturing

Subject Code: 6TMPE 103
Theory Max. Marks: 50
Theory Min. Marks: 17

COURSE OBJECTIVE:

This course aims to acquaint the students with principles, concepts and techniques that are essential in Computer Integrated Manufacturing.

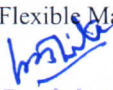
Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Computer integrated manufacturing System Definition, CIM wheel concept, Evolution of (IM, CIM and system view of manufacturing, and CIM IT & Concurrent Engineering, Elements of CIM system, CIM hardware and software.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Computer Aided Design Historical background, Development of CAD, CAD system hardware, Software, Graphics standards, Basic definitions, Modes of graphic operation, User interface, Software modules, Modeling and viewing.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	2D - Representation and Transformation of Points - -transformation of Lines - Rotation. Reflection. Scaling and combined transformations - 3Dscaling - shearing - Rotation - Reflection - Translation - Projections parametric representation of Ellipse, Parabola, Hyperbola	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Wire frame, Surface and Solid modelling - Solid modelling packages - Finite Element Analysis (FEA) -Introduction and procedures - Solution Techniques - Introduction to (-EA packages.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Manufacturing Planning and Control - CAD/CAM Integration - Principles of Computer Integrated Manufacturing - Hierarchical Network of Computers - Local Area Networks - Process Planning: Computer Aided Process Planning - Retrieval and Generative approaches.	Usage of ICT like PPT, Video Lectures, Black board.
UNIT- VI	CNC Machine Tool and Programming Development of CNC Technology, Principles, Features, NC,CNC,ONC concepts, Classification of CNC Machine Tools, CNC Controller, CNC Programming for various. Controllers -SI numeric, Fanuc Program, G&M codes, Part Programming of Prismatic and revolved components, APT part programming using CAD, CAM S/w.	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcomes:

The students who succeeded in this course,

- Students will develop an understanding of CAD systems and graphical modeling.
- Students will get acquainted with data bases and numerical analysis related to CIM
- Students will have understanding of Computer Aided Manufacturing (CAM) systems
- Students will have an introduction to Computer Aided Process Planning (CAPP) Systems, Robotic Systems, Group Technology and Cellular Manufacturing Systems
- Students will cultivate understanding about Automated Material Handling Systems, Automated Inspection Systems, Flexible Manufacturing Systems(FMS)


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Text Books:


- CAD/CAM/CIM Radhakrishnan P, Subramanyan S. and Raju V New Age International
- Concurrent Engineering Mustapha. I New Age International Pvt.
- Computer Integrated Manufacturing Ranky Paul. G. Prentice Hall International
- Principles of CIM Kant Vajpayee. S. Prentice Hall of India,
- Computer Aided Design and Manufacturing Groover M.P Prentice Hall of India, 1987

Reference Books:

- Production System & CIM Groover M.P PHI
- CAD/CAM Theory & Practice Zeid Mc Graw Hills
- Mathematical Elements for Computer Graphics David F. Rogers, J. A. Adams, TMH
- CIM- Towards the factory of the future Scheer. A.W. Springer -Verlag,
- CIM Hand Book Daniel Hunt. V., Chapman & Hall
- Computer Control of Manufacturing System Yorem Koren, McGraw Hill

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Design officer, Manager, Production engineer	Creative designing for different parts of automobile, problem solving for failure and fault.	Goal08(Decent Work and Economical Growth) Goal04(Quality Education)	Show rooms, industries, garage shop and manufacturing industries. power plant


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SEMESTER- 1st
Course: M. Tech (Production)
SUBJECT: Computer aided process planning

Subject Code: 6TMPE 104
Theory Max. Marks: 50
Theory Min. Marks: 17

COURSE OBJECTIVE:

After studying this unit, you should be able to –

- Understand what is process planning and CAPP.
- Know the various steps involved in CAPP.
- Classify the various methods of CAPP,
- Understand the feature recognition in CAPP

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Introduction: The Place of Process Planning in the Manufacturing cycle - Process Planning and Production Planning - Process Planning and Concurrent Engineering, CAPP, Group Technology.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Part design representation: Design Drafting - Dimensioning - Conventional tolerancing - Geometric tolerancing - CAD - input / output devices - topology - Geometric transformation - Perspective transformation - Data structure - Geometric modelling for process planning - GT coding - The optiz system - The MICLASS system.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Process engineering and process planning: Experienced, based planning - Decision table and decision trees - Process capability analysis - Process Planning - Variant process planning - Generative approach - Forward and Backward planning, Input format, AI.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Computer aided process planning systems: Logical Design of a Process Planning - Implementation considerations - manufacturing system components, production Volume, No. of production families - CAM-I, CAPP, MIPLAN, APPAS, AUTOPLAN and PRO, CPPP.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	An intergraded process planning systems: Totally integrated process planning systems - An Overview - Modulus structure - Data Structure, operation - Report Generation, Expert process is planning.	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcomes:-

At the end of the course, the student will be able to-

- Generate the structure of automated process planning system and uses the principle of generative and retrieval CAPP systems for automation.
- Select the manufacturing sequence and explains the reduction of total set up cost for a particular sequence.
- Predict the effect of machining parameters on production rate, cost and surface quality and determines the manufacturing tolerances.
- Explain the generation of tool path and solve optimization models of machining processes.
- Create awareness about the implementation techniques for CAPP

Text Books:

Wolcott
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- Computer Aided Manufacturing Rao P.N. TMH
- Industrial Robotics Technology: Programming and Applications M. P. Groover, Mitchell Weis, Roger, N. Nagel, G. Nicholas and Odrey Mc Graw-Hill,
- Principles of Process Planning, A logical approach, I. Alevi and R.D. Weill, Chapman & Hall,
- An Introduction to automate process planning systems, Tien-Chien Chang, Richard A. Wysk, Prentice Hall
- Systems Approach to Computer Integrated Design and Manufacturing, Nanua Singh, John Wiley
- Systems Approach to Computer Integrated Design and Manufacturing Singh, N. John Wiley & Sons

Reference Books:

- Principles of Process Planning Gideon Halevi and Roland D. Weill Chapman & Hall
- An Expert Process Planning System Chang T.C. Prentice Hall
- Systems Approach to Computer Integrated Design and Manufacturing Nanua Singh John Wiley & Sons
- An Introduction to automated process planning systems Chang, T.C. and Wysk, R.A. Prentice Hall,
- An Expert Process Planning System Chang, T.C. Prentice Hall
- Principles of Process Planning Halevi, G. and Weill, R.D. A logical approach – Springer, 2003.

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Service Engineer, Manger	Able to understand human factors in production system, human performance	Goal12(Responsible Consumption and Production) Goal04(quality education)	Start business Unit (retail and Micro) Service Consultancy


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SEMESTER- 1st

Course: M. Tech (Production)

SUBJECT: Manufacturing Automation and Mechatronics

Subject Code: 6TMPE 105

Theory Max. Marks: 50

Theory Min. Marks: 17

COURSE OBJECTIVE:

- To develop an ability to identify, formulate, and solve engineering problems.
- To develop an ability to design a system, component, or process to meet desired needs within realistic constraints.
- To develop an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Fundamental of Manufacturing and Automation; Manufacturing industries, Types of production, Function in manufacturing, Organisation & Information process in manufacturing, Plant layout, Production concept and mathematical model automation strategies	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Analysis of Automated Flow Lines Terminology, Analysis of transfer lines, Partial automation, Automated flow lines with storage buffers, Computer simulation of automated flow lines.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Automated Assembling System Design for automated assembly, types of automated assembly, Past feeding devices, Analysis of multi-station assembly M/c, Analysis of single station assembly m/c.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Mechatronics Introduction to Mechatronics - Systems - Mechatronics in Products - Measurement Systems -Control Systems -Traditional design and Mechatronics Design.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – V	Sensors & Transducers Introduction - Performance Terminology - Displacement, Position and Proximity - Velocity and Motion - Fluid pressure - Temperature sensors - Light sensors - Selection of sensors - Signal processing - Servo systems.	Usage of ICT like PPT, Video Lectures, Black board.
	Microprocessors in Mechatronics Introduction - Architecture - Pin configuration - Instruction set - Programming of Microprocessors using 8085 instructions - Interfacing input and output devices - Interfacing D/A converters and A/D converters -Applications - Temperature control - Stepper motor controller, Traffic light controller.	Usage of ICT like PPT, Video Lectures, Black board.
	Programmable Logic Controllers Introduction, basic structure, input-output processing, programming, Mnemonic, Timers, Internal relays and counters, data handling, Analog input / output - Selection of PLC. Design & Mechatronics Designing, Possible design solutions. Case studies of Mechatronics systems.	Usage of ICT like PPT, Video Lectures, Black board.

Course outcomes:

- Awareness about automation, types, line balancing, FMS and cellular manufacturing.
- Applying computing tool for CNC programming and simulation.
- Exposure to control strategies adopted in CNC and automation

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Text Books:

- Microprocessor Architecture Ramesh Gaonkar Wiley East P
- Intro. to Microprocessors for Engg Ghosh P.K. and Sridhar P.R. PHI
- Computer Based Industrial Control Krishna Kant EEE- PHI
- Hand book of design, manufacturing and Automation R.C. Dorf John Wiley and Sons
- Industrial Automation W. P. David John Wiley and Sons

Reference Books:

- Production System & CIM Groover PHI
- CAD/CAM Theory & Practice Zeid TMH
- Mechatronics, Electronic control systems in mechanical and electrical engg W. Bolton Pearson Education
- Introduction to Mechatronics and Measuring Systems David G. Alcaiatore and Michel B. Histan Mc. Graw Hill
- Introduction to Mechatronic System Design with Applications, Craig K. C. and Stolfi, F. R. IEEE Educational Activities Department
- The Mechatronics Handbook Robert H. Bishop CRC Press

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Service Engineer, Manger	Able to understand human factors in production system, human performance	Goal12(Responsible Consumption and Production) Goal04(quality education)	Start business Unit (retail and Micro) Service Consultancy

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SEMESTER- 1st

Course: M. Tech (Production)

SUBJECT: Audit Course-I

1: ENGLISH FOR RESEARCH PAPER WRITING

Subject Code: 6TMST 106

Theory Max. Marks:

Theory Min. Marks

COURSE OBJECTIVE:

Students will be able to:

1. Understand that how to improve your writing skills and level of readability
2. Learn about what to write in each section
3. Understand the skills needed when writing a Title

Ensure the good quality of paper at very first-time submission

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticising, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts, Introduction	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Review of the Literature, Methods, Results, Discussion, Conclusions, the Final Check.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions.	Usage of ICT like PPT, Video Lectures, Black board.
	useful phrases, how to ensure paper is as good as it could possibly be the first-time submission	Usage of ICT like PPT, Video Lectures, Black board.

Text Books:

- Communications Skills Sanjay Kumar and Pushp Lata. Oxford University Press.
- Technical Communication Principles and Practices Meenakshi Raman, Sangeetha Sharma, Oxford University Press,
- Technical Communication Rhirdion, Daniel, Cengage Learning, New Delhi,
- How to Write and Publish a Scientific Paper R. Day, Cambridge University Press
- Academic Writing for Graduate Students: Essential Tasks and Skills. John M. Swales. 2nd Edition ISBN-13: 978-0-472-08856-0
- Science Research Writing for Non-Native Speakers of English. Hilary Glasman-Deal ISBN-13: 978-1-84816-309

Reference Books:

- Practical English Usage Michael Swan. Oxford University

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- Remedial English Grammar F.T. Wood. Macmillan.
- On Writing Well William Zinsser. Harper Resource Book,
- Essential English Grammar with Answers Raymond Murphy, Cambridge University Press

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
	Able to provide speaking skills and Writing skill	Goal04(quality education)	

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DR. C.V.RAMAN UNIVERSITY
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SEMESTER- 1st
Course: M. Tech (Production)
SUBJECT: Audit Course-I
2: PEDAGOGY STUDIES

Subject Code: 6TMST 106
Theory Max. Marks:
Theory Min. Marks

COURSE OBJECTIVE:

Students will be able to:

1. Review existing evidence on the review topic to inform programme design and policy making undertaken by the DFID, other agencies and researchers.
2. Identify critical evidence gaps to guide the development.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Introduction and Methodology: Aims and rationale, Policy background, Conceptual framework and terminology Theories of learning, Curriculum, Teacher education. Conceptual framework, Research questions. Overview of methodology and Searching.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Thematic overview: Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries. Curriculum, Teacher education.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Evidence on the effectiveness of pedagogical practices Methodology for the in depth stage: quality assessment of included studies. How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? Theory of change. Strength and nature of the body of evidence for effective pedagogical practices. Pedagogic theory and pedagogical approaches. Teachers' attitudes and beliefs and Pedagogic strategies.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Professional development: alignment with classroom practices and follow up support Peer support Support from the head teacher and the community. Curriculum and assessment Barriers to learning: limited resources and large class sizes	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Research gaps and future directions Research design Contexts Pedagogy Teacher education Curriculum and assessment Dissemination and research impact.	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcomes:

Students will be able to understand:

- What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
- What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
- How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

Text Books:

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- Classroom Interaction in Kenyan Primary Schools, J. Ackers, F. Hardman, Compare', 31 (2): 245-261, 2001.
- Curricular Reform in Schools: The Importance of Evaluation, M. Agrawal, Journal of Curriculum Studies', 36 (3): 361-379, 2004.
- 'Culture and Pedagogy: International Comparisons in Primary Education, R.J. Alexander, Oxford and Boston', Blackwell, 2001.
- Read India: A Mass Scale, Rapid, M. Chavan ' Learning to Read' Campaign, 2003.


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- Curricular reform in schools: The importance of evaluation, Agrawal M Journal of Curriculum Studies, 36 (3): 361-379.
- Teacher training in Ghana - does it count?
- Akyeampong K Multi-site teacher education research project (MUSTER) country report 1. London: DFID.
- Improving teaching and learning of basic Maths and reading in Africa: Does teacher preparation count? Akyeampong K, Lussier K, Pryor J, Westbrook J International Journal Educational Development, 33 (3): 272-282.

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
	Able to provide different skills and rating skill	Goal04(quality education)	


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SEMESTER- 1st

Course: M. Tech (Production)

SUBJECT: Audit Course-I

1: ENGLISH FOR RESEARCH PAPER WRITING

Subject Code: 6TMST 106

COURSE OBJECTIVE:

Students will be able to:

1. Understand that how to improve your writing skills and level of readability
 2. Learn about what to write in each section
 3. Understand the skills needed when writing a Title
- Ensure the good quality of paper at very first-time submission

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticising, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts, Introduction	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Review of the Literature. Methods. Results, Discussion, Conclusions, the Final Check.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions.	Usage of ICT like PPT, Video Lectures, Black board.
	useful phrases, how to ensure paper is as good as it could possibly be the first-time submission	Usage of ICT like PPT, Video Lectures, Black board.

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- Technical Communication Principles and Practices Meenakshi Raman, Sangeetha Sharma, Oxford University Press,
- Technical Communication Rhirdion, Daniel, Cengage Learning, New Delhi,
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- Academic Writing for Graduate Students: Essential Tasks and Skills. John M. Swales. 2nd Edition ISBN-13: 978-0-472-08856-0
- Science Research Writing for Non-Native Speakers of English. Hilary Glasman-Deal ISBN-13: 978-1-84816-309

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- Remedial English Grammar F.T. Wood. Macmillan.
- On Writing Well William Zinsser. Harper Resource Book,
- Essential English Grammar with Answers Raymond Murphy, Cambridge University Press

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
	Able to provide speaking skills and Writing skill	Goal04(quality education)	

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DR. C.V.RAMAN UNIVERSITY
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SEMESTER- 1st

Course: M. Tech (Production)

SUBJECT: Audit Course-I

2: PEDAGOGY STUDIES

Subject Code: 6TMST 106

COURSE OBJECTIVE:

Students will be able to:

1. Review existing evidence on the review topic to inform programme design and policy making undertaken by the DFID, other agencies and researchers.
2. Identify critical evidence gaps to guide the development.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Introduction and Methodology: Aims and rationale, Policy background, Conceptual framework and terminology Theories of learning, Curriculum, Teacher education. Conceptual framework, Research questions. Overview of methodology and Searching.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Thematic overview: Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries. Curriculum, Teacher education.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Evidence on the effectiveness of pedagogical practices Methodology for the in depth stage: quality assessment of included studies. How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? Theory of change. Strength and nature of the body of evidence for effective pedagogical practices. Pedagogic theory and pedagogical approaches. Teachers' attitudes and beliefs and Pedagogic strategies.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Professional development: alignment with classroom practices and follow up support Peer support Support from the head teacher and the community. Curriculum and assessment Barriers to learning: limited resources and large class sizes	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Research gaps and future directions Research design Contexts Pedagogy Teacher education Curriculum and assessment Dissemination and research impact.	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcomes:

Students will be able to understand:

- What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
- What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
- How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

Text Books:

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- Classroom Interaction in Kenyan Primary Schools, J. Ackers, F. Hardman, Compare', 31 (2): 245-261, 2001.
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- Read India: A Mass Scale, Rapid, M. Chavan ' Learning to Read' Campaign, 2003.

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- Teacher training in Ghana - does it count?
- Akyeamong K Multi-site teacher education research project (MUSTER) country report 1. London: DFID.
- Improving teaching and learning of basic Maths and reading in Africa: Does teacher preparation count? Akyeamong K, Lussier K, Pryor J, Westbrook J International Journal Educational Development, 33 (3): 272-282.

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
	Able to provide different skills and rating kill	Goal04(quality education)	


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SEMESTER- 1st

Course: M. Tech (Production)

SUBJECT: Audit Course-I

3: STRESS MANAGEMENT BY YOGA

Subject Code: 6TMST 106

COURSE OBJECTIVE:

1. To achieve overall health of body and mind
2. To overcome stress

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Definitions of Eight parts of yog. (Ashtanga)	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Yam and Niyam. Do's and Don't's in life. i) Ahinsa, satya, astheya, bramhacharya and aparigraha ii) Shaucha, santosh, tapa, swadhyay, ishwarpranidhan	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Asan and Pranayam i) Various yog poses and their benefits for mind & body ii) Regularization of breathing techniques and its effects-Types of pranayam	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcomes:

Students will be able to:

- Develop healthy mind in a healthy body thus improving social health also
- Improve efficiency

Text Books:

- Anatomy and Physiology of Yogic Practices M.M. Gore. Motilal Banarsidass, New Delhi.
- Power yoga Rajiv Jain Paperback New Delhi Stress Management for Life: A Research- Based Experiential Approach.
- Olpin, M. & Hesson, M. Wadsworth Publishing. ISBN # 13-978-1305120594.
- Reset: Make the Most of Your Stress: Your 24-7 Plan for Well-being. Lee, K. Universe Publishing. ISBN # 978-1-4917-4757-5

Reference Books:

- Physical Education for Children: A Focus on the Teaching Process", Bette J., Logsdon
- Lea & Febiger, Philadelphia Foundation of Physical Education Exercise
- Science and Sports Deborah A. Wuest, Charles A. Bucher. TMH New Delhi
- Physiology of Sports and Exercise Jack H. Wilmore, David L. Costill, Human Kinetics Publication
- An Introduction to Physical Education John E. Nixon, Ann E. Jewett. Thomson Learning London.

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
role of yoga in physical development of body	Education in yoga ability	Goal04(quality education)	Yoga teacher

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KARGI ROAD, KOTA, BILASPUR (C.G.)

SEMESTER- 1st

Course: M. Tech (Production)

SUBJECT: Advanced in Mfg. Technology

Subject Code: 6TMPE 106

Practical Max. Marks: 25

Practical Min. Marks: 12

COURSE OBJECTIVE:

1. To achieve overall health of body and mind
2. To overcome stress

Lab-1

Course objective:

The course should enable the students to:

- Utilize the students knowledge of functioning code of CNC and make a job on CNC machine.
- Utilize accurate and efficient computational methods for the solution of job.

List of experiment:

- To study principles and functioning of CNC milling machine.
- To study Basics programming of CNC milling machine.
- To write a program for Circular Interpolation G2 / G3 operation and perform on the CNC milling machine.
- To write a program for taper turning operation and perform on the CNC lathe machine.
- To write a program for drilling operation and perform on the CNC lathe machine.

Course outcomes:

- Apply the concepts of NC part programming in CNC machine.
- Design of model and create finished work with the help of CNC machine.

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Service Engineer, Manger	Able to understand human factors in production system, human performance	Goal12(Responsible Consumption and Production) Goal04(quality education)	Start business Unit (retail and Micro) Service Consultancy

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DR. C.V.RAMAN UNIVERSITY
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SEMESTER- 1st

Course: M. Tech (Production)

SUBJECT: Comp. Integrated Manufacturing

Subject Code: 6TMPE 107

Practical Max. Marks: 25

Practical Min. Marks : 12

COURSE OBJECTIVE:

The course should enable the students to:

- Utilize the students' knowledge of part programming code of CNC and make a job on CNC machine.
- Utilize accurate and efficient computational methods for the solution of job.

Lab-2

List of experiment:

- To write a program for facing operation and perform on the CNC lathe machine.
- To write a program for turning operation and perform on the CNC lathe machine.
- To write a program for step turning operation and perform on the CNC lathe machine.
- To write a program for slot cutting operation and perform on the CNC milling machine.
- To write a program for Pocket operation and perform on the CNC milling machine.

Course outcomes:-

- Apply the concepts of NC part programming in CNC machine.
- Design of model and create finished work with the help of CNC machine.

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Service Engineer, Manger	Able to understand human factors in production system, human performance	Goal12(Responsible Consumption and Production) Goal04(quality education)	Start business Unit (retail and Micro) Service Consultancy

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SEMESTER- 2nd
Course: M. Tech (Production)
SUBJECT: Supply Chain Management

Subject Code: 6TMPE 201
Theory Max. Marks: 50
Theory Min. Marks: 17

COURSE OBJECTIVE:

Course Objectives Supply Chain Management involves the flows of materials and information among all of the firms that contribute value to a product, from the source of raw materials to end customers. We will integrate issues from finance (investments in productive assets), marketing (channels of distribution), logistics, and operations management to develop a broad understanding of a supply chain. By taking a strategic perspective, we will focus on relatively long term decisions involving the investment in productive resources, configuration of processes, product designs, and development of partnerships with suppliers and channels of distribution.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Introduction: Logistics - Concepts, Definitions. Approaches, factors affecting logistics. Supply chain basic tasks of the supply chain - the new corporate model.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Supply chain management: The new paradigm, the modular company, and the network relations. Supply process, Procurement process - Distribution management.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Evolution of supply chain models: Strategy and structure - factors of supply chain - Manufacturing strategy stages, supply chain progress - model for competing through supply chain management - PLC grid, supply chain redesign - Linking supply chain with customer.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Supply chain activity systems: Structuring the SC, SC and new product, functional roles in SC, SC design frame-work, collaborative product commerce (CPC).	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	SCM organisation and information system: The management task, logistics organisation, the logistics information systems -Topology of SC application - MRP, ERP, Warehouse management system, product data management - cases.	Usage of ICT like PPT, Video Lectures, Black board.

Course outcomes:

- This will course will enhance the knowledge and understanding of supply chain issues and appropriate approaches to analyzing and responding to them.
- This course will enhance your communication and collaboration skills.
- This should enhance your worldview of business and society.
- In addition, several of the cases and one of the experiential learning exercises provide opportunities to discuss the role of responsibility and integrity in supply chain management.

Text Books:

- Managing the global supply chain ,Scharj, P.B. and Lasen, T.S.Viva books, New Delhi
- Hand book of supply chain management Ayers, J.B. The St. Lencie press
- S C M, Strategy, Planning, and Operation Chopra, S. and Meindl P. PHI

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- Operation & supply chain management Bozarth & Hanfield Pearson

Reference Books:

- Handbook of Supply Chain Management Ayers, J.B. Taylor and Francis Group
- Logistics Bloomberg, D.J., Lemay, S. and Hanna, J.B. PHI
- Logistics and Supply Chain Management – Strategies for Reducing Cost and Improving Service Christopher, M., Pearson Education Asia
- Modeling the supply Chain Shapiro, J.F. and Duxbury, T. TMH

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Service Engineer, Manager	Able to understand human factors in production system, human performance	Goal12(Responsible Consumption and Production) Goal04(quality education)	Start business Unit (retail and Micro) Service Consultancy


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SEMESTER- 2nd

Course: M. Tech (Production)

SUBJECT: FMS AND FEA

Subject Code: 6TMPE 202

Theory Max. Marks: 50

Theory Min. Marks: 17

COURSE OBJECTIVE:

- To learn basic principles of finite element analysis procedure.
- To learn the theory and characteristics of finite elements that represent engineering structures.
- To learn and apply finite element solutions to structural, thermal, dynamic problem to develop the knowledge and skills needed to effectively evaluate finite element analyses performed by others.
- Learn to model complex geometry problems and solution techniques.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	CM System: Concurrent engineering and design methodology, collaborative product development, Product data management for manufacturing and design data reuse product life cycle management, and collaborative product, commerce, Advance manufacturing, Cellular, Synchronous Agile, Lear, Manufacturing system, concept of rapid prototyping, reverse engineering, re-engineering, case studies.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	FMS: Definition of FMS, types and configuration, concept, types of flexibility and performance measures, Function of FMS host computer, FMS host and area controller, function distribution. Development and implementation: Planning phase integration, system configuration, FMS layouts, simulation, FMS project development steps.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Basics of FEM - Initial value and boundary value problems - weighted residual, Galerkin and Raleigh Ritz methods - Review of Variational calculus -Integration by parts - Basics of Variational formulation.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Steps in FEA -Discretization, interpolation, derivation of element characteristic matrix function, assembly and imposition of boundary conditions - Solution and post processing, One-dimensional analysis in solid mechanics and heat transfer.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Global and Natural co-ordinates - Shape functions for one and two dimensional elements - Three noded triangular and four noded quadrilateral element -non linear analysis - Iso parametric elements - Jacobian matrices and transformations - Basics of two dimensional axis symmetric analysis.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - VI	FE analysis of metal casting - Special considerations, latent heat incorporation. gap element - Time stepping procedures - crank -Nicholson ,algorithm- Prediction of grain structure - Basic concepts of plasticity - Solid and flow formulation - Small incremental deformation formulation - FE analysis of metal cutting. chip separation criteria, incorporation of strain rate dependency.	Usage of ICT like PPT, Video Lectures, Black board.

Course outcomes:

- Upon successful completion of this course you should be able to:
- Understand the concepts behind variational methods and weighted residual methods in FEM.

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- Identify the application and characteristics of FEA elements such as bars, beams, plane and iso parametric elements, and 3-D element.
- Develop element characteristic equation procedure and generation of global stiffness equation will be applied.
- Able to apply Suitable boundary conditions to a global structural equation, and reduce it to a solvable form.
- Able to identify how the finite element method expands beyond the structural domain, for problems involving dynamics, heat transfer, and fluid flow

Text Books:

- Principles of CIM Vajpayee PHI
- Text book of Finite Element Analysis Seshu PHI
- Introduction of FEE Chandrupatla & Ashok PHI
- The Finite Element Element methods in engg Rao S. S. Pergamon Press

Reference Books:

- An Introduction to FEM Reddy J. N. TMH
- Applied FEM Segarland L. J. Wiley
- Concept and application of FEA R. D. Cook Wiley
- Fundamental of FEA David V. Hutton TMH

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Engineer in Manufacturing Industry. Production Management.	Able to cast material in various component, able to work on various machines	Goal 09(Industry innovation and infrastructure) Goal 04(Quality Education) Goal 08(Decent work and Economic Growth)	Casting of component, Machining of component.

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SEMESTER- 2nd
Course: M. Tech (Production)
SUBJECT: Operation Management

Subject Code: 6TMPE 203
Theory Max. Marks: 50
Theory Min. Marks: 17

COURSE OBJECTIVE:

Upon course completion, the participants will be able to:

- To gain an understanding and appreciation of the principles and applications relevant to the planning, design, and operations of manufacturing/service firms.
- To develop skills necessary to effectively analyze and synthesize the many inter-relationships inherent in complex socio-economic productive systems.
- To reinforce analytical skills already learned, and build on these skills to further increase your "portfolio" of useful analytical tools for operations tasks.
- To gain some ability to recognize situations in a production system environment that suggests the use of certain quantitative methods to assist in decision making on operations management and strategy.
- To understand how Enterprise Resource Planning and MRPII systems are used in managing operations.
- To increase the knowledge, and broaden the perspective of the world in which you will contribute your talents and leadership in business operations.
- To understand the managerial responsibility for Operations, even when production is outsourced, or performed in regions far from corporate headquarters.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Operations Management: Introduction, Systems concept, Decisions, Organization, Objectives and Evolution of Operations Management, comparing production of tangible goods and services, Operations Strategy, Type of Production Systems, Role of Production Manager.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Facilities Planning & Production Planning Control: Plant location, Plant layout and Material Handling, Layout analysis, Procedures such as CORELAP, CRAFT etc. Organization & Functions of PPC CAPP, Make or Buy Decision, Forecasting Methods & its relationship with Product Life Cycle, Case Studies.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Aggregate Planning and Master Scheduling: Strategies of Aggregate Planning, Graphic & and Charting methods, Application of LP, Master Scheduling, Job Shop Scheduling and Sequencing Algorithms Gantt Chart, Line Balancing, LOB, Case Studies.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Maintenance Management: Types of maintenance strategies, Breakdown, Preventive and Predictive maintenance, Individual and Group Replacement Policies, Case Studies.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Materials Management as part of supply chain, Purchasing, stores and vendor selection, Inventory Models, Selective Inventory Control, MRP, MRP-II, Lot size Techniques, Just - In - Time system of manufacturing, Kaizen, Total Productive Maintenance (TPM), BPR, SCM, ERP etc.& Case Studies.	Usage of ICT like PPT, Video Lectures, Black board.

Course outcomes:

- Understand the core features of the operations and production management function at the operational and strategic levels, specifically the relationships between people, process, technology, productivity and quality and how it contributes to the competitiveness of firms.

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- Explain the various parts of the operations and production management processes and their interaction with other business functions (strategy, engineering, finance, marketing, HRM, project management and innovation)

Text Books:


- Production & Operations Management Charry S.N. TMH
- Production and Operations Management Bedi Kaniska Oxford Pub
- Materials Management Chitle A.K., Gupta R.C. PHI
- Operations Management Mahadevan Pearson

Reference Books:

- Outline of Operations Management Monk Joseph TMH
- Purchasing & Materials Management Dobler & Lee PHI
- Production & Operations Management Chase and Aquilino TMH
- Production Planning and Control Eilon S. McMillon Pub.
- Mfg planning and control for SCM Vollmann TMH
- Production and Operations analysis Nahmias Steven TMH

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Manager, supervisor, boiler operator, maintenance engineer	Able to identify use of thermal instruments and devices, use of heating devices	Goal08 (Decent Work and Economical Growth) Goal07 (affordable and clean energy)	Industries and manufacturing industries. Power Plant


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SEMESTER- 2nd

Course: M. Tech (Production)

SUBJECT: Robotics and Automated Material Handling

COURSE OBJECTIVE:

Subject Code: 6TMPE 204

Theory Max. Marks: 50

Theory Min. Marks:17

After studying this unit, you should be able to understand the

- Importance of AGV in a computer-integrated manufacturing system,
- Role of industrial robots in a computer-integrated manufacturing systems, and
- Alternative for automated material handling system.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Introduction: Basic concepts - Robot anatomy - Robot configurations - Basic robot motions - Types of drives - Applications - Material handling - processing - Assembly and Inspection - safety considerations.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Transformations and kinematics: Vector operations - Translational transformations and Rotational transformations - Properties of transformation matrices- Homogeneous transformations and Manipulator - Forward solution - Inverse solution.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Controls and end effectors: Control system concepts - Analysis - control of joints - Adaptive and optimal control - End effectors - Classification - Mechanical - Magnetic - Vacuum - Adhesive - Drive systems - Force analysis and Gripper design.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Robot programming: Methods - Languages -Computer control and Robot Software -VAL system and Language.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Sensory devices: Non optical and optical position sensors - Velocity and Acceleration - Range - Proximity - touch - Slip - Force - Torque - Machine vision - Image components - Representation - Hardware - Picture coding - Object recognition and categorization - Software consideration.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - VI	Automated Material Handling and Storage: Functions types and analysis of material handling equipment, Design of conveyor and AGV system, Storage system performance, AS/RS, Carousels storage system, WIP storage system, Interfacing handling, Storage within manufacturing.	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcome:

After the successful completion of this course, the student will be able:

- To explain the basic principles of Robotic technology, configurations, control and programming of Robots.
- Design an industrial robot which can meet kinematic and dynamic constraints.
- To describe the concept of Robot kinematics and dynamics, latest algorithms & analytical approaches.
- To discuss and apply the concepts of dynamics for a typical Pick and Place robot.
- To choose the appropriate Sensor and Machine vision system for a given application.
- To explain the basic principles of programming and apply it for typical Pick & place, loading & unloading and palletizing applications.

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Text Books:

- Aspects of Material handling, K C Arora & Shinde Lakshmi Publications.
- Operations Management, P B Mahapatra PHI
- Plant layout and Material Handling, A W Peymberton John Wiley
- Plant layout and Material Handlin James A Apple Krieger Pub Co
- Materials Handling Equipment N. Rudenko Envee Publishers, New Delhi
- Materials Handling Equipment M.P. Alexandrov. Mie publications, Moscow

Reference Books:

- Robotics control, sensing, vision, and intelligence Fu KS. and Gonzalez R.C. TMH
- Robot Engineering AnIntergrated approach Klafter R.D. and Chmielewski TA. Prentice Hall of India, New Delhi,
- Robotics Technology Deb S.R. TMH
- Introduction to Robotics Mechanics and Control Craig J., J Addison-Wesley
- Industrial robotics Technology programming and application. Groover TMH

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Service Engineer, Power plant Manger	Able to understand and manage how to produce power in various power section and Understanding of how to develop power.	Goal04(Quality education) Goal08(Decent work and economic growth).	Can start own manufacturing units or a Service Consultancy


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SEMESTER- 2nd

Course: M. Tech (Production)

SUBJECT: Reliability and Total Productive Maintenance

Subject Code: 6TMPE 205

Theory Max. Marks: 50

Theory Min. Marks:17

COURSE OBJECTIVE:

One of the main objectives of RPM is to increase the productivity of a factory and its equipment with a modest investment in maintenance. Reliability and total productive maintenance (TPM) are considered as the key operational activities of the quality management system. In order for TPM to be effective, the full support of the total workforce is required. This should result in accomplishing the goal of TPM: "Enhance the volume of the production, employee morale and job satisfaction. The main objective of TPM is to increase the Overall Equipment Effectiveness of plant equipment. TPM addresses the causes for accelerated deterioration while creating the correct environment between operators and equipment to create ownership.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Introduction: Reliability function - MTBF - MTTF - mortality curve - availability - Maintainability.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Failure data analysis: Repair time distributions - exponential, normal, log normal, gamma, and Weibull- reliability data requirements - Graphical evaluation.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Reliability prediction: Failure rate estimates - Effect of environment and stress - Series and Parallel systems - RDB analysis - Standby Systems - Complex Systems.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Reliability management: Reliability demonstration testing - Reliability growth testing - Duane curve - Risk assessment - FMEA, Fault tree.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Total productive maintenance: Causes of Machine Failures - Downtime - Maintenance policies - Restorability predictions - Replacement models - Spares provisioning - Maintenance management - Cleanliness and House Keeping.	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcomes:

On completion, you will be able to:

Understand the relationship of key concepts in reliability engineering and application to maintenance strategies in a manufacturing environment.

Establish maintenance strategies according to system characteristics and design transition programs to implement these strategies.

Manage the manufacturing organisation with highest possible availability.

Text Books:

Maintenance and, spare Parts Management Gopalakrishnan, P and Banerji A.K. Prentice Hall of India, New Delhi

Introduction to TPM Seiichi Nakajima, Productivity Press, Chennai

Maintenance and Spare Parts Management Gopalakrishnan P. and Banerji A.K. Prentice – Hall of India Pvt. Ltd.

Equipment planning for TPM Maintenance Prevention Design Goto, F., Productivity Press,

Total Productive Maintenance for Workshop Leaders Shirose, K. Productivity Press

Reference Books:

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Reliability and Risk AnalysisModarresMeralDekkerInc
 Reliability for technology Engineering & ManagementPaul KalesPrentice Hall, New Jersey
 TPM for OperatorsShirose, K.Productivity Press,
 New Directions for TPMSuzuki, T.Productivity Press
 Maintenance Planning and ControlKelly, A.Butterworth, London

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Manager, supervisor, boiler operator, maintenance engineer	Able to identify use of thermal instruments and devices, use of heating devices	Goal08(Decent Work and Economical Growth) Goal07(affordable and clean energy)	Industries and manufacturing industries. Power Plant

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SEMESTER- 2nd

Course: M. Tech (Production)

SUBJECT: Audit Course-II

1: DISASTER MANAGEMENT

Subject Code: 6TMST 206

COURSE OBJECTIVE:

-Students will be able to:

1. Learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.
2. Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
3. Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
4. Critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Introduction Disaster: Definition, Factors And Significance; Difference Between Hazard And Disaster; Natural And Manmade Disasters: Difference, Nature, Types And Magnitude.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Repercussions Of Disasters And Hazards: Economic Damage, Loss Of Human And Animal Life, Destruction Of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts And Famines, Landslides And Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts. Disaster Prone Areas In India Study Of Seismic Zones: Areas Prone To Floods And Droughts, Landslides And Avalanches; Areas Prone To Cyclonic And Coastal Hazards With Special Reference To Tsunami; Post-Disaster Diseases And Epidemics	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Disaster Preparedness And Management Preparedness: Monitoring Of Phenomena Triggering A Disaster Or Hazard; Evaluation Of Risk: Application Of Remote Sensing, Data From Meteorological And Other Agencies, Media Reports: Governmental And Community Preparedness.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Risk Assessment Disaster Risk: Concept And Elements, Disaster Risk Reduction, Global And National Disaster Risk Situation. Techniques Of Risk Assessment, Global Co-Operation In Risk Assessment And Warning, People's Participation In Risk Assessment. Strategies for Survival.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Disaster Mitigation Meaning, Concept And Strategies Of Disaster Mitigation, Emerging Trends In Mitigation. Structural Mitigation And Non-Structural Mitigation, Programs Of Disaster Mitigation In India.	Usage of ICT like PPT, Video Lectures, Black board.

Course Objectives:

To get a working knowledge in illustrious Sanskrit, the scientific language in the world

- Learning of Sanskrit to improve brain functioning
- Learning of Sanskrit to develop the logic in mathematics, science & other subjects
- Enhancing the memory power
- The engineering scholars equipped with Sanskrit will be able to explore the huge knowledge from ancient literature


Text Books:

- Psychosocial care in Disaster management, Satapathy S. NIDM publication.
- Landslide Disaster Assessment and Monitoring Nagarajan, R., Anmol Publications, New Delhi,
- Environmental risks and hazards Cutter, Susan L., Prentice Hall of India, New Delhi.
- Disaster Management, Gupta, Harsh K. Universities Press (India) Pvt. Ltd
- Environmental Hazards Smith, K., Routledge, London,
- Geological Hazards Bell, F.G., Routledge, London


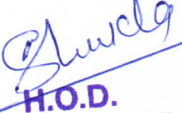
Reference Books:

- Principles of Engineering Geology Krynine, D.S. and Judd, W.R., CBS, New Delhi
- Natural Hazards Bryant, E., Cambridge University Press. London
- Introduction to International Disaster Management, Coppola, Damon P. Butterworth -Heinemann
- Natural & Anthropogenic Disasters: Vulnerability, Preparedness & Mitigation, Jha, Madan Kumar Springer

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Service Engineer, Manger	Able to understand and manage competition Understanding of consumer behavior & solving problem S Able to handle sales and queries	Goal-12(Responsible Consumptions and Production technique)	Start business Unit (retail and Micro) Service Consultancy


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SEMESTER- 2nd

Subject Code: 6TMST 206

Course: M. Tech (Production)

SUBJECT: Audit Course-II

2: PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS

COURSE OBJECTIVE:

Students will be able to

1. Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life
2. The person who has studied Geeta will lead the nation and mankind to peace and prosperity
3. Study of Neetishatakam will help in developing versatile personality of students

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Neetisatakam-Holistic development of personality • Verses- 19,20,21,22 (wisdom) • Verses- 29,31,32 (pride & heroism) • Verses- 26,28,63,65 (virtue) • Verses- 52,53,59 (don't's) • Verses- 71,73,75,78 (do's)	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Approach to day to day work and duties. • Shrimad BhagwadGeeta : Chapter 2-Verses 41, 47,48, • Chapter 3-Verses 13, 21, 27, 35, Chapter 6-Verses 5,13,17, 23, 35, • Chapter 18-Verses 45, 46, 48.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Statements of basic knowledge. • Shrimad Bhagwad Geeta: Chapter2-Verses 56, 62, 68 • Chapter 12 -Verses 13, 14, 15, 16,17, 18 • Personality of Role model. Shrimad BhagwadGeeta: Suggested reading 1. “Srimad Bhagavad Gita” by Swami SwarupanandaAdvaita Ashram (Publication 2. Department), Kolkata 3. Bhartirhari's Three Satakam (Niti-sringar-vairagya) by P.Gopinath, 4. Rashtriya Sanskrit Sansthanam, New Delhi.	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcomes:

- To learn to achieve the highest goal happily
- To become a person with stable mind, pleasing personality and determination
- To awaken wisdom in students

Text Books:

- Srimad Bhagavad Gita Swami SwarupanandaAdvaita Ashram Publication Department), Kolkata.
- Bhartirhari's Three Satakam (Niti-sringar-vairagya) P. Gopinath, Rashtriya Sanskrit Sansthanam, New Delhi.

Reference Books:

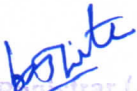
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- Seven Habit of Highly Effective Teens, Covey Sean, New York, Fireside Publishers,
- How to win Friends and Influence People, Carnegie Dale, New York: Simon & Schuster,
- I am ok, You are ok , Thomas A Harris, New York-Harper and Row,
- Emotional Intelligence, Daniel Coleman, Bantam Book,

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Manager, supervisor, boiler operator, maintenance engineer	Able to identify use of thermal instruments and devices, use of heating devices	Goal08(Decent Work and Economical Growth) Goal07(affordable and clean energy)	Industries and manufacturing industries. Power Plant


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SEMESTER- 2nd

Course: M. Tech (Production)

SUBJECT: Audit Course-II

3: VALUE EDUCATION

Subject Code: 6TMST 206

COURSE OBJECTIVE:

Students will be able to

1. Understand value of education and self- development
2. Imbibe good values in students
3. Let the should know about the importance of character

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Values and self-development –Social values and individual attitudes. Work ethics, Indian vision of humanism. • Moral and non- moral valuation. Standards and principles. • Value judgements	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Importance of cultivation of values. • Sense of duty. Devotion, Self-reliance. Confidence, Concentration. Truthfulness, Cleanliness. • Honesty, Humanity. Power of faith, National Unity. • Patriotism, Love for nature, Discipline	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Personality and Behavior Development - Soul and Scientific attitude. Positive Thinking. Integrity and discipline. • Punctuality, Love and Kindness. • Avoid fault Thinking. • Free from anger, Dignity of labour. • Universal brotherhood and religious tolerance. • True friendship. • Happiness Vs suffering, love for truth. • Aware of self-destructive habits. • Association and Cooperation. • Doing best for saving nature	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Character and Competence –Holy books vs Blind faith. • Self-management and Good health. • Science of reincarnation. • Equality, Nonviolence, Humility, Role of Women. • All religions and same message. • Mind your Mind, Self-control. • Honesty, Studying effectively	Usage of ICT like PPT, Video Lectures, Black board.

Course outcomes:

Students will be able to

- Knowledge of self-development
- Learn the importance of Human values
- Developing the overall personality

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Text Books:


- Moral and Value Education; Principles and Practices, Sharma, S.P. Kanishka publishers,
- Value Education: K. Charles & V. A. Selvi. Neelkamal Publications, New Delhi,
- Value Education. Passi, B.K. and Singh, P. National Psychological Corporation, Agra.
- Education and Human Values, Chitakra, M.G. A.P.H. Publishing Corporation, New Delhi.
- Values and Ethics for Organizations Theory and Practice S.K. Chakroborty, Oxford University Press, New Delhi.


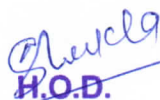
Reference Books:

- Values in Education and Education in Value. Monica J. Taylor. Routledge.
- The End of Education: Redefining the Value of School. Neil Postman. Vintage publisher.
- Education, Social Values and Social Work-the Task for the New Generation, Malhotra P.L. N.C.E.R.T.
- Value Education. Venkataiah. N APH Publishing.
- Philosophical discussion in moral education, Sprod, T. The community of ethical inquiry. Routledge – 2001 – 244 pages, Series: Routledge International Studies in the Philosophy of Education.

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Service Engineer, Manger	Able to understand and manage competition Understanding of consumer behavior & solving problem S Able to handle sales and queries	Goal-12(Responsible Consumptions and Production technique)	Start business Unit (retail and Micro) Service Consultancy


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SEMESTER- 2nd

Course: M. Tech (Production)

SUBJECT: FMS AND FEA

Subject Code: 6TMPE 206

Practical Max. Marks: 25

Practical Min. Marks: 12

Lab-3

Course objective:

The course should enable the students to:

- Utilize the students' knowledge of machining process and make a job on machine.
- Utilize accurate and efficient computational methods for the solution of job.


List of experiment:


- To perform Step turning and taper turning operations on the given work piece through centre Lathe machine.
- To calculate the machining time for cylindrical turning on a Lathe and compare with the actual machining time.
- To study the effect of the current on weld strength-using spot welding process.
- Study of non-conventional machining processes.
- To determine analysis of bolt in ANSYS workbench.

Course outcomes:

- Apply the concepts of machining operation and ANSYS programming.
- Design of model and create finished work with the help of machine.

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Manager, supervisor, boiler operator, maintenance engineer	Able to identify use of thermal instruments and devices, use of heating devices	Goal08(Decent Work and Economical Growth) Goal07(affordable and clean energy)	Industries and manufacturing industries. Power Plant


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SEMESTER- 2nd

Course: M. Tech (Production)

SUBJECT: Part Drawing and Design

Subject Code: 6TMPE 207

Practical Max. Marks: 25

Practical Min. Marks: 12

Lab-4

Course objective:

The course should enable the students to:

- Utilize the students' knowledge of programming of modelling software.
- Utilize accurate and efficient computational methods for the solution of part model.

List of experiment:


- To plot 2-D drawing of circular with rectangle block in AutoCAD
- To plot 3D solid model of L section in Auto CAD
- To plot 3D solid model of L section with hole circular in AutoCAD
- To plot 3-D solid model of Rectangular with circular hole in CATIA
- To plot the bolt design in CATIA

Course outcomes:

- Apply the concepts of 2-D and 3-D workbench in AUTO CAD and CATIA software.
- Design of model and create finished work with the help of CNC machine.

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Engineer in Manufacturing Industry. Production Management.	Able to cast material in various component, able to work on various machines	Goal 09(Industry innovation and infrastructure) Goal04(Quality Education) Goal 08(Decent work and Economic Growth)	Casting of component, Machining of component.


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SEMESTER- 3rd
Course: M. Tech (Production)
SUBJECT: CNC Machines

Subject Code: 6TMPE 301(A)
Theory Max. Marks:50
Theory Min. Marks:17

COURSE OBJECTIVE:

This course introduces the concepts and capabilities of computer numerical control machine tools. Topics include setup, operation, and basic applications. Upon completion, students should be able to explain operator safety, machine protection, data input, program preparation, and program storage.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Introduction to CNC machine tools: Development of CNC Technology, principles, features, advantages, economic benefits, applications, CNC, DNC concept, classification of CNC Machine, types of control, CNC controllers, characteristics, interpolators.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Structure of CNC machine tool: CNC Machine building, structural details, configuration and design, guide ways - friction and anti friction and other types of guide ways, elements used to convert the rotary motion to a linear motion - Screw and nut, recirculating roller screw, planetary roller screw, recirculating roller screw, rack and pinion, torque transmission elements - gears, timing belts, flexible couplings, Bearings.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Drives and controls: Spindle drives - DC shunt motor, 3 phase AC induction motor, feed drives - stepper motor, servo principle, DC & AC servomotors. Open loop and closed loop control, Axis measuring system - synchro, synchro-resolver, gratings, moire fringe gratings, encoders, inductosyn, laser interferometer.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	CNC PROGRAMMING: Coordinate system, structure of a part program, G & M Codes, Manual part programming for Fanuc, Heidenhain, Sinumeric control system, CAPP, APT part programming using CAD/CAM, Parametric Programming.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Tooling and maintenance of CNC: Cutting tool materials, carbide insets classification, qualified, semi qualified and preset tooling, tooling system for Machining centre and Turning centre, work holding devices, maintenance of CNC Machines.	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcomes:

- Understand ASA and ORS systems of tool geometry and their inter-relations.
- Develop relations for chip reduction coefficient, shear angle, shear strain, forces, power, specific energy and temperature in orthogonal cutting.
- Select cutting fluids, tool materials and coatings to control tool wear and temperature.
- Evaluate cutting speed to minimize production cost and maximize production rate.
- Understand the working principles, applications and importance of modern machining processes.

Text Books:

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Oliver
Dr. C.V. Raman University
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- CNC Machines Radhakrishnan. P. New Central Book Ag
- Systems Approach to Computer-Integrated Design and Manufacturing Singh, N. Wiley India Pvt.
- CAD/CAM Rao, P.N.T TMH
- Computer Aided Manufacturing Chang, T.C., Wysk, R.A. and Wang, H.P. Pearson Prentice Hall,
- Computer Numeric Control Seamers, W.S. Thomson Delmar,


Reference Books:

- CNC Machining Hand Book James Madison Industrial Press Inc.
- CNC Technology and Programming Steve Krar, Arthur Gill. TMH
- CNC Programming Hand Book Peter Smid Industrial Press Inc.
- Introduction to CNC Berry Leathan, Jones, Pitman. London
- CNC Part Programming Work Book Bernard Rodgers, Cizv and Guid, Macmillan

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Design officer, Manager, Production engineer	Creative designing for different parts of automobile, problem solving for failure and fault.	Goal09(Industry, innovation and infrastructure) Goal08(Decent work and economic growth) Goal04(Quality education)	Industries, garage shop and manufacturing industries. power plant


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SEMESTER- 3rd
Course: M. Tech (Production)
SUBJECT: MIS and ERP

Subject Code: 6TMPE 301(B)
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

At the end of the course, it is expected that students are able to understand the usage of Information Systems in management. The students also would understand the activities that are undertaken in acquiring an Information System in an organization. Further the student would be aware of various Information System solutions like ERP, CRM, Data warehouses and the issues in successful implementation of these technology solutions in any organization.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Management Information System (MIS) definition, Objectives and benefits, MIS as strategic tool, obstacles and challenges for MIS, functional and cross functional systems, hierarchical view of CBIS, structured and unstructured decision, Operation and mgt support, Decision process and MIS, info system components and activities, Value chain and MIS support.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	System concepts: types, definition, characteristics, feedback (Pull) and feed-forward (Push) control, system stress and entropy, computer as closed system, law of requisite variety, open and flexible (Adaptive) systems, work system model and comparison with input-process-output model, five views of work system: structure, performance, infrastructure, context and risk and their effect on product performance.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Info concepts: define data, info, knowledge, intelligence and wisdom. Information characteristics and attributes, info measurement and probability, characteristics of human as info processor.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Planning and control Concepts: terminologies, difficulties in planning, system analysis and development plan-purpose and participants, info planning, (SDLC) system development life cycle for in-house and licensed sw, system investigation, analysis of needs, design and implementation phases, training of Operational personnel, evaluation, Control and Maintenance of Information Systems.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – V	E-business components and interrelationship, Evolution of Enterprise Resource Planning (ERP) from MRP, Supply chain management (SCM) and Customer relationship management (CRM), Integrated data model, strategic and operational issues in ERP, Business Process Re-Engineering (BPR), significance and functions, BPR, information technology and computer NW support to MIS.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – VI	ERP Implementation, role of consultants, vendors and users, customization, methodology of ERP implementation and guidelines for ERP implementation, ERP modules.	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcome:

The student is able to understand an MIS in real-life situation, identify the need of MIS, implementation issues in MIS in that organization and future trends in that system. Output is expected in form of a term paper.

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Text Books:


- Management Information System Jawadekar TMH
- Business Process Re-Engineering Jayaraman TMH
- ERP V.K. Garg PHI
- Management Information System Kelkar SA PHI
- Management Information System Jaisal M & Mital Oxford higher Edu

Reference Books:

- Management Information System David & Olson TMH
- Management Information System O' Brian J TMH
- ERP Alex Leon MFG-pro.
- Management Information System Turban & Aronson PHI
- Management Information System Kenneth Laudon Prentice Hall

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Service Engineer, Manger, R&D labs	Able to understand and manage competition Understanding of consumer behaviour & solving problems and able to handle sales and queries.	Goal09(Industry, innovation and infrastructure) Goal08(Decent work and economic growth) Goal04(Quality education)	Start business Unit (retail and Micro). Calibration Service Consultancy


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SEMESTER- 3rd

Course: M. Tech (Production)

SUBJECT: Flexible competitive mfg. Systems

Subject Code: 6TMPE 302(A)

Theory Max. Marks: 50

Theory Min. Marks:17

COURSE OBJECTIVE:

The course serves as an introduction to the modern methods of manufacturing. Its objectives are:

- To expose the student to the different types of manufacturing available today such as the Special Manufacturing System, the Manufacturing Cell, and the Flexible Manufacturing System (FMS).
- To learn the fundamentals of computer assisted numerical control programming and programming languages.
- The automated flow lines.
- The common CAD/CAM data base organized to serve both design and manufacturing.
- To practice the PLC control devices and CNC operation skills.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Manufacturing in a competitive environment: Automation of manufacturing process - Numerical control - Adaptive control - material handling and movement - Industrial robots - Sensor technology - flexible, fixturing - Design for assembly, disassembly and service.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Group technology: Part families - classification and coding - Production flow analysis - Machine cell design - Benefits.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Flexible manufacturing systems: introduction - Components of FMS - Application work stations - Computer control and functions - Planning, scheduling and control of FMS - Scheduling - Knowledge based scheduling - Hierarchy of computer control - Supervisory computer.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	COMPUTER SOFTWARE, SIMULATION AND DATABASE of FMS: System issues- Types of software - specification and selection - Trends - Application simulation - software - Manufacturing data systems - data flow - CAD/CAM considerations - Planning FMS database.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	JUST IN TIME: Characteristics of JIT - Pull method - quality -small lot sizes - work station loads - close supplier ties - flexible work force - line flow strat."b'Y' - preventive maintenance - Karban system - strategic implications - implementation issues -ARD liT – Lean manufacture.	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcomes:-

- At the end of the course, the student will be able to:
- Apply the concepts of PPC and GT to the development of FMS.
- Discuss the planning and scheduling methods used in manufacturing systems.
- Identify various workstations, system support equipments and hardware components of FMS.
- Select suitable database and software required for FMS.
- Summarize the concepts of modern manufacturing such as JIT, supply chain management and lean manufacturing etc.

Text Books:

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- CAD/CAM/CTM Radhakrishnan P. and Subramanyan S. New Age International Ltd.
- Flexible manufacturing systems: recent development Raouf A. & Ben-Daya, Elsevier Science
- Computer Aided Design & Manufacturing. Dr Sadhu Singh. KP
- Computer Integrated Manufacturing. S.K.Vajpayee. PHI
- Basic electronics. V.K. Mehta S.Chand

Reference Books:

- Automation, Production System Groover MP Prentice-Hall of India Pvt. Ltd.
- Handbook of Flexible Manufacturing; Systems Jha N.K. Academic Press Inc.
- Manufacturing Engineering and technology Kalpakjian, Addison-Wesley Publishing Co.
- Production System beyond Large-Scale production Taiichi and Ohno Productivity Press (India) Pvt. Ltd

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Logistics Manager, Production manager	Creative designing for different parts of automobile, problem solving for failure and fault.	Goal08(Decent Work and Economical Growth)	Show rooms, industries, garage shop and manufacturing industries. power plant


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SEMESTER- 3rd
Course: M. Tech (Production)
SUBJECT: Total Quality Management

Subject Code: 6TMPE 302(B)
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

This subject provides students with the knowledge to

- Understand the philosophy and core values of Total Quality Management (TQM).
- Determine the voice of the customer and the impact of quality on economic performance and long-term business success of an organization; apply and evaluate best practices for the attainment of total quality.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Introduction: Principles of Quality Management - Pioneers of TQM - Quality costs - Quality system Customer Orientation - Benchmarking - Re-engineering - Concurrent Engineering.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Practices of TQM: Leadership - Organisational Structure - Team Building – Information Systems and Documentation - Quality Auditing - ISO 9000 - QS 9000.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Techniques of TQM: Single Vendor Concept - J.I.T. - Quality Function deployment - Quality Circles - KAIZEN - SGA - POKA - YOKE - Taguchi Methods.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Statistical quality control: Methods and Philosophy of Statistical Process Control - Control Charts for Variables and Attributes - Cumulative sum and Exponentially weighted moving average control charts - Others SPC Techniques - Process Capability Analysis - Six sigma accuracy.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Acceptance sampling: Acceptance Sampling Problem - Single Sampling Plans for attributes - double, multiple and sequential sampling, Military standards - The Dodge Roming sampling plans.	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcomes:-

Upon completion of the subject, students will be able to

- Select and apply appropriate techniques in identifying customer needs, as well as the quality impact that will be used as inputs in TQM methodologies.
- Measure the cost of poor quality and process effectiveness and efficiency to track performance quality and to identify areas for improvement.
- Understand proven methodologies to enhance management processes, such as benchmarking and business process reengineering.
- Choose a framework to evaluate the performance excellence of an organization, and determine the set of performance indicators that will align people with the objectives of the organization.

Text Books:

ISO 9000 A Manual for TQM Suresh Dalela and Saurabh S. Chand
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- Total Quality Management Oakland Butterworth- Heinemann Ltd.
- Total Quality Management Besterfield Dale H Pearson Edu
- Quality Control & Application B. L. Hanson & P. M. Ghare, PHI
- Total Quality Management V.S Bagad Technical Pub
- Total Quality Management S. Rajaram Dreamtech Press

Reference Books:

- Total Quality Control Feigenbaum A.V. MGH
- TQM for Engineers Mohamed Zairi Woodhead Publishing Limited
- The Six Sigma Manual for Small and Medium Businesses Baird, C.W. Atlantic Publishing Company
- The Essence of TQM John Bank Prentice Hall of Pvt. Ltd.
- Statistical Quality Control Grant E.L and Levensworth TMH

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Service Engineer, Manger, R&D labs	Able to understand and manage competition Understanding of consumer behaviour & solving problems and able to handle sales and queries.	Goal09(Industry, innovation and infrastructure) Goal08(Decent work and economic growth) Goal04(Quality education)	Start business Unit (retail and Micro). Calibration Service Consultancy


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SEMESTER- 3rd
Course: M. Tech (Production)
SUBJECT: CI process inventory system

Subject Code: 6TMPE 302(C)
Theory Max. Marks:50
Theory Min. Marks:17

COURSE OBJECTIVE:

This course aims to introduce the students to the fundamental nature of inventory from a financial, physical, forecasting, and operational standpoint. The ultimate goal of this course is to present immediately usable information in the areas of forecasting, physical control and layout, and problem recognition and resolution.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Demand forecasting: Characteristics and Principles, Methods, Qualitative Methods - Delphi technique, Market Research, Intrinsic method-time-series analysis, moving averages, exponential smoothing - The Bon Jenkins method, Extrinsic methods - Regression models, measurement of forecast errors. Characteristics and Principles, Methods, Qualitative Methods Delphi technique, Market Research, Intrinsic methods - time-series analysis, moving averages, exponential smoothing - The Bon Jenkins method, Extrinsic methods - Regression models, measurement of forecast errors.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Inventory management: Functions of inventory - Objectives - Inventory systems - Inventory models - Basic and advanced inventory models. Functions of inventory-Objectives - Inventory systems - Inventory models - Basic and advanced inventory models.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Production planning: Purpose, Characteristics - Aggregate Planning - methods - Master Production Scheduling - functions - Time buckets - time fences - Orders - Reports. Purpose, Characteristics - Aggregate Planning - Methods - Master Production scheduling - functions - Time buckets -time fences - Orders - Reports.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	MATERIALS, REQUIREMENT PLANNING AND CAPACITY PLANNING: purpose of MRP - Inputs to MRP - MRP LOGIC - Planning Factors - Outputs from MRP - Resource Planning -Capacity Planning. Purpose of MRP - Inputs to MRP - MRP LOGIC - Planning factors - Outputs from MRP - resource Planning - Capacity Planning	Usage of ICT like PPT, Video Lectures, Black board.
Unit – V	Current trends JIT Supply chain Management concurrent engineering MRP II ERP	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcomes:-

- Understand that modern practice discourages holding large quantities of inventory.
- Grasp the significance of controlling actual, on-hand inventory as both a physical object (shelf count) and as an intangible object (record count and monetary worth).
- Understand the fundamental differences between finished goods inventories in the retail/distribution sectors and raw materials and work-in-process inventories found in the manufacturing environment.
- Understand basic formulas to calculate inventory quantities.
- Employ basic problem-solving techniques toward issue resolution.


Text Books:

- Systems approach to computer-integrated design and Manufacturing Nanu Singh John Wiley &, Sons
- Operations Management Theory and Practice B. Mahadevan. TMH
- Production Planning and Inventory Control Narasimhan, Mc Leavy, Billington, PHI
- Inventory Control Svan Axsater Springer International Publishing
- Manufacturing Planning and Control Systems Vollmann, Thomas, E. and Others, Richard D., Irwin, Illinois

Reference Books:

- Operations Mgt Strategy and Analysis LJ. Krajewski and LP. Ritzman Addison Wesley
- Computer Based Production and Inventory Control B.Smith PHI
- Production and Operations Management Joseph S. Martink John wiley& sons
- Operation Management Joseph Monks TMH

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
sales officer, Manager,	Creative designing for different parts of automobile, problem solving for failure and fault.	Goal-08(Decent Work and Economical Growth)	Show rooms, industries, garage shop and manufacturing industries. power plant


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SEMESTER- 3rd

Course: M. Tech (Production)

SUBJECT: Research Methodology and IPR

Subject Code: 6TMPE 303

Practical Max. Marks: 50

Practical Min. Marks: 25

COURSE OBJECTIVE:

The course has been developed with orientation towards research related activities and recognizing the ensuing knowledge as property. It will create consciousness for Intellectual Property Rights and its constituents. Learners will be able to perform documentation and administrative procedures relating to IPR in India as well as abroad.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Effective literature studies approaches, analysis Plagiarism, Research ethics. New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge, Case Studies.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Effective technical writing, how to write report, Developing a Research Proposal, Format of research proposal, presentation and assessment by a review committee.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications.	Usage of ICT like PPT, Video Lectures, Black board.

Course Outcomes:

- At the end of the course, students will demonstrate their ability to:
- Understanding and formulation of research problem.
- Analyze research related information.
- Understand plagiarism and follow research ethics
- Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.

Text Books:

- Intellectual Property Rights Under WTO T. Ramappa S. Chand
- Intellectual Property Law, Narayanan P. Eastern Law House
- Human Values Tripathi A.N. New Age International
- Organizational Behavior Robbins, S.P. PHI
- Textbook on International Human Rights Rhona K. M. Smith: Oxford University Press

Reference Books

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- Resisting Intellectual Property Halbert Taylor & Francis Ltd
- Industrial Design Mayall McGraw Hill
- Product Design Niebel McGraw Hill
- Introduction to Design Asimov Prentice Hall
- Journal of Intellectual Property Rights, published by National Institute of Science Communication, CSIR.

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Production Engineer, Machine analyst.	Ability to develop the various machining operation.	Goal12(Responsible Consumptions and production)	A popular technical skill is developed to start fabrication workshop.

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SEMESTER- 3rd

Course: M. Tech (Production)

SUBJECT: Dissertation Part-I

Subject Code: 6TMPE 304

Practical Max. Marks: 120

Practical Min. Marks:60

Course Outcomes:

The Project Work is start in this semester and should preferably be a problem with research potential and should involve scientific research, design, generation/collection and analysis of data, and must preferably bring out the individual contribution. The dissertation part-I should be presented in standard format as provided by the department. The candidate has to prepare a project report consisting of introduction of the problem, problem statement, literature review, objectives of the work, proposed methodology of solution and expected results. The work has to be presented in front of the examiners panel consisting of an approved external examiner and an internal examiner as decided by the Head and PG coordinator.

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
R& D labs, production engineer, research fellow	Able to write research papers, thesis, and develop an idea to innovation, presentation skills	Responsible Consumptions and Production	Start business Unit (retail and Micro) Service Consultancy

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Kota, Bilaspur (C.G.)



DR. C.V.RAMAN UNIVERSITY

KARGI ROAD, KOTA, BILASPUR (C.G.)

SEMESTER- 4th

Course: M. Tech (Production)

SUBJECT: Dissertation Part-II

Subject Code: 6TMPE 401

Practical Max. Marks: 300

Practical Min. Marks:150

Course Outcomes:

The Project Work will start in semester III and should preferably be a problem with research potential and should involve scientific research, design, generation/collection and analysis of data, determining solution and must preferably bring out the individual contribution. The dissertation should be presented in standard format as provided by the department. The candidate has to prepare a detailed project report consisting of introduction of the problem, problem statement, literature review, objectives of the work, methodology (experimental set up or numerical details as the case may be) of solution and results and discussion. The report must bring out the conclusions of the work and future scope for the study. . The work has to be presented in front of the examiners panel consisting of an approved external examiner, an internal examiner and a guide, co-guide etc. as decided by the Head and PG coordinator. The candidate has to be in regular contact with his guide.

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
R& D labs, production engineer, research fellow	Able to write research papers, thesis, and develop an idea to innovation, presentation skills	Responsible Consumptions and Production	Start business Unit (retail and Micro) Service Consultancy

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