



Implementation of CBCS / ECS

Minutes of Meetings (MoM) of Board of Studies (BoS)

Academic Year : 2021-22	
School	: School of Studies of Engineering and Technology
Department	: Industrial and Production Engineering
Date and Time	: July 23, 2021 - 11:00 AM
Venue	: Online

The scheduled meeting of member of Board of Studies (BoS) of Department of Industrial and Production Engineering, School of Studies of Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur was held to design and discuss the B. Tech. Fourth year (VII and VIII semesters) scheme and syllabi.

The following members were present in the meeting:

1. Prof. G.K. Agrawal (External Expert Member BoS, Professor, GEC Bilaspur)
2. Mr. Dalbir Singh Rekhi (Member BoS Industry Expert, J.S.P.L. Raigarh CG.)
3. Prof. Mukesh Kumar Singh (Member BoS, Professor, Dept. of Industrial and Production Engineering)
4. Prof. S.C. Srivastava (HOD, Prof., Dept. of Industrial and Production Engineering-cum Chairman, BOS)
5. Mr. C.P. Dewangan (Member BoS, Associate Professor, Dept. of Industrial and Production Engineering)
6. Mrs. Disha Dewangan (Member BoS, Assistant Professor, Dept. of Industrial and Production Engineering)
7. Mrs. Arpita Roy Choudhary (Invited Member, Professor, Dept. of Industrial and Production Engineering)
8. Dr. Atul Kumar Sahu (Invited Member, Assistant Professor, Dept. of Industrial and Production Engineering)
9. Mr. Ganesh Prasad Shukla (Invited Member, Assistant Professor, Dept. of Industrial and Production Engineering)
10. Mr. Nitin Kumar Sahu (Invited Member, Assistant Professor, Dept. of Industrial and Production Engineering)
11. Mr. Kailas Kumar Borkar (Invited Member, Assistant Professor, Dept. of Industrial and Production Engineering).
12. Mr. Leeladhar Rajput (Invited Member, Assistant Professor, Dept. of Industrial and Production Engineering).
13. Mr. Anurag Singh (Invited Member, Assistant Professor, Dept. of Industrial and Production Engineering).
14. Mr. Kawal Lal Kurrey (Invited Member, Assistant Professor, Dept. of Industrial and Production Engineering).



Following points were discussed during the meeting

1. In the meeting, New Choice Based Credit System(CBCS) scheme and syllabus of B.Tech VII and VIII semester (Industrial and Production Engineering) were discussed in details. All suggestion of the members are incorporated and modified and then recommended for approval.
2. The New CBCS scheme and syllabus of B.Tech (Industrial and Production Engineering) VII and VIII semester have been accepted by the BOS (I.P.E.)

The following new courses were introduced in the of B. Tech. Final year (VII and VIII Semesters):

1. Indian Constitution (IP07TMC02)
2. Fundamentals of Green Manufacturing (IP07TPE51)
3. Advanced Manufacturing Processes (IP07TOE21)
4. Maintenance Management (IP07TOE23)
5. Essence of Indian Traditional Knowledge (IP08TMC03)
6. Intellectual Property Rights (IP08THS41)
7. Computer Aided Process Planning (IP08TOE31)
8. Microprocessors in Automation (IP08TOE32)

विभागाध्यक्ष/Head
औद्योगिक एवं उत्पादन अभियांत्रिकी
Industrial & Production Engineering
टी.टी.टी. संस्थान/Engineering & Technology
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Signature & Seal of HoD

गुरु घासीदास विश्वविद्यालय
(केन्द्रीय विश्वविद्यालय अधिनियम 2009 अ. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय)
कोनी, बिलासपुर - 495009 (छ.ग.)



Guru Ghasidas Vishwavidyalaya
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)
Koni, Bilaspur - 495009 (C.G.)

Scheme and Syllabus



DEPARTMENT OF INDUSTRIAL & PRODUCTION ENGINEERING, GGUV, BILASPUR CG

GURU GHASIDAS VISHWAVIDYALAYA (A CENTRAL UNIVERSITY), BILASPUR, CG
SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

Department of Industrial & Production Engineering

CBCS-New, Study & Evaluation Scheme W.E.F. Session: 2021-22

B. TECH FOURTH YEAR, VII SEMESTER

S. No	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME			CREDITS
			L	T	P	INTERNAL ASSESSMENT	ESE	SUB-TOTAL	
1.	IP07TPC14	Computer Aided Design & Manufacturing	3	1	-	30	70	100	4
2.	IP07TPC15	Production Planning and Control	3	-	-	30	70	100	3
3.	IP07TPE05	Professional Elective-05	3	-	-	30	70	100	3
4.	IP07TOE02	Open Elective-02	3	-	-	30	70	100	3
5.	IP07TMC02	Indian Constitution	3	-	-	-	-	-	-
Total			15	1	-	120	280	400	13
PRACTICALS									
1.	IP07PPC08	CAD/CAM Lab	-	-	2	30	20	50	1
2.	IP07PSC02	Seminar on Summer Training	-	-	4	50	-	50	2
3.	IP07PPR01	Minor Project	-	-	8	100	-	100	4
Total			-	-	14	180	20	200	7

Total Credits: **20**

Total Contact Hour: **30**

Total Marks: **600**

INTERNAL ASSESSMENT: two class tests of 15 marks each will be conducted.

L-LECTURE, T-TUTORIAL, P-PRACTICAL, ESE -END SEMESTER EXAMINATION

IP07TPE05 Professional Electives-05
IP07TPE51 Fundamentals of Green Manufacturing
IP07TPE52 Product Design & Development
IP07TPE53 Engineering Economics
IP07TOE02 Open Elective-02
IP07TOE21 Advanced Manufacturing Processes
IP07TOE22 Principles of Management
IP07TOE23 Maintenance Management



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Course Name & Semester	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME				CREDITS
			L	T	P	INTERNAL ASSESSMENT		ESE	SUB-TOTAL	
						CT-I	CT-II			
B. Tech. VII Sem.	IP07TPE51	Fundamentals of Green Manufacturing	3	-	-	15	15	70	100	3

COURSE LEARNING OBJECTIVES:

The objectives of this course are:

- To originate engineering skills to identify, formulate, and solve industrial process problems.
- To demonstrate the concept of organization, production systems and cost analysis.
- To understand the problems and opportunities faced by the operations manager in manufacturing and service organizations.
- To develop an ability to apply PPC concepts in a various areas like marketing, accounting, finance, engineering, personnel management, logistics, etc.
- To integrate operations concepts with other functional areas of business and to compile several important contemporary topics relevant to business managers under functional disciplines, including quality management, production concepts, and sustainability issues.
- To evaluate the PPC function in both manufacturing and service organizations and to examine several dilemmas related to operations management, production planning and inventory control.

COURSE OUTCOMES:

After successful completion of the course, the students will be able to:

- Recognize the objectives, functions and applications of Production management and allied techniques.
- Categorize and solve different inventory control techniques, forecasting dilemmas, routing problems and scheduling troubles.
- Summarize various aggregate production planning techniques and integrating them to different departments to execute effective PPC functions.
- Inspect organizational performance, production systems, demand trends, location feasibility and cost analysis.
- Elaborate and estimate methods of line balancing, process sheets, production strategies, sales forecasting and maintenance.

COURSE CONTENT:



MODULE-I

Introduction: Sustainable development, indicators of sustainability, sustainability strategies, sustainable manufacturing, evolution of sustainable manufacturing, elements of sustainable manufacturing, theory of green manufacturing and its principles, need for green manufacturing, drivers and barriers of green manufacturing.

MODULE - II

Green manufacturing strategy: Manufacturing strategy, elements of manufacturing strategy, manufacturing outputs, competitive priorities: quality, delivery speed and reliability, cost efficiency, flexibility, order winners and order qualifier, tradeoff, production systems, manufacturing levers, competitive analysis, level of manufacturing capability, framework for formulating manufacturing strategy, implications of green manufacturing for manufacturing strategy.

MODULE - III

Life cycle approach of green manufacturing: Holistic and total Life-cycle approach, six step methodologies for green manufacturing (6-R approach), life cycle assessment (LCA), elements of LCA, life cycle costing, eco labelling target setting, data collection and processing, final evaluation by virtue of criteria, environmental management systems.

MODULE - IV

Green manufacturing technology: Definition of green manufacturing technology and practices, classifications of green manufacturing technology, advantages and disadvantages of implementation of green technology.

MODULE - V

Lean and Green manufacturing: Introduction, lean evolution & steps, introduction to lean manufacturing, definition of lean manufacturing, lean vs. green manufacturing: similarities and differences.

TEXT & REFERENCE BOOKS:

1. Cleaner Production: Environmental and Economic Perspectives, Misra Krishna B., Springer, Berlin, Latest edition.
2. Environmental Management Systems and Cleaner Production, Dr. Ruth Hillary, Wiley, New York, Latest edition.
3. Pollution Prevention: Fundamentals and Practice, Paul L Bishop, TMH.
4. Costing the earth, Cairncross and Francis, Harvard Business School Press - 2009.
5. The principle of sustainability, Simon Dresner, -Earth Scan publishers (2008).
6. Manufacturing strategy: How to formulate and implement a winning plan, Jhon Miltenburg, Productivity Press Portland, Oregon-2017.



Course Name & Semester	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME				CREDITS
			L	T	P	INTERNAL ASSESSMENT		ESE	SUB-TOTAL	
						CT-I	CT-II			
B. Tech. VII Sem.	IP07TPE53	Engineering Economics	3	-	-	15	15	70	100	3

COURSE LEARNING OBJECTIVES:

The objectives of this course are:

- Prepare students to analyse cost/revenue data and carry out economic analyses in the decision-making process to justify or reject alternatives/projects on an economic basis.

COURSE OUTCOMES:

At the end of the course, the students will be able to:

- Describe the role of economics in the decision-making process and perform calculations in regard to interest formulas.
- Trained towards estimating the present, annual and future worth comparisons for cash flows.
- Calculate the rate of return, depreciation charges and income taxes.
- Enumerate different cost entities in estimation and costing the elements of budgeting.
- Explain the importance of finance functions, financial ratios and solve related problems.

COURSE CONTENT:

MODULE - I

Basic concepts and definitions: Methodology of economics, demand and supply-elasticity, theory of the firm and market structure, price and output determinations in different types of market.

MODULE - II

Public sector economics: Welfare economics, central and commercial banks and their functions, industrial policies, theory of localization, weber & surgent florence theory, investment analysis - NPV, ROI, IRR, payback period, SWOT analysis.

MODULE - III

Monetary and fiscal policy: Tools, impact on the economy, inflation, business cycle, cash flow-2, 3, 4 model.

MODULE - IV

Business forecasting: Elementary techniques, cost and revenue analysis, capital budget, break even analysis.

MODULE - V



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Course Name & Semester	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME			CREDITS	
			L	T	P	INTERNAL ASSESSMENT		ESE		SUB-TOTAL
						CT-I	CT-II			
B. Tech. VII Sem.	IP07TOE21	Advanced Manufacturing Processes	3	-	-	15	15	70	100	3

COURSE LEARNING OBJECTIVES:

The objective of this course is to:

- To understand the principle of various advanced machining processes kinematics drive of machine tool.
- To impart knowledge about cutting different material removal, joining processes.
- To understand about various advanced metal forming processes.
- Explain how to identify suitable hybrid welding processes for joining dissimilar materials.
- To understand about various advanced casting processes.

COURSE OUTCOMES:

At the end of the course the students will be able to:

- Analyze real-life application in various organizations.
- Categorize different material removal, joining processes as per the requirements of material being used to manufacture end product.
- Choose material processing technique with the aim of cost reduction, reducing material wastage & machining time.
- Estimate process parameters affecting the product quality in various advanced machining of metals/ non-metals, ceramics and composites.

COURSE CONTENT:

MODULE – I

Advanced machining processes: Introduction, micro machining process, principle, material removal mechanism, parametric analysis and applications of processes such as ultrasonic machining (USM), abrasive jet machining (AJM), water jet machining (WJM), abrasive water jet machining (AWJM), electrochemical machining (ECM), electro discharge machining (EDM), electron beam machining (EBM), laser beam machining (LBM) processes, working principle of plasma arc machining.

MODULE – II

Advanced machining theory & practices: Mechanisms of chip formation, shear angle relations, and theoretical determination of cutting forces in orthogonal cutting, analysis of turning, drilling and



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milling operations, mechanics of grinding, dynamometry, thermal aspects of machining, tool wear, economics of machining, processing of polymers, ceramics, and composites.

MODULE – III

Advanced metal forming processes: Details of high energy rate forming (HERF) process, electro-magnetic forming, explosive forming electro-hydraulic forming, stretch forming, contour roll forming.

MODULE – IV

Advanced welding processes: Details of electron beam welding (EBW), laser beam welding (LBW), ultrasonic welding (USW), cold welding, diffusion welding, forge welding, friction welding, explosive welding, hard vacuum welding, soft vacuum welding, underwater welding processes, concept of robotized welding and welding automation.

MODULE -V

Advanced casting processes: Metal mould casting, continuous casting, squeeze casting, vacuum mould casting, evaporative pattern casting, ceramic shell casting.

TEXT & REFERENCE BOOKS:

1. Manufacturing processes for Engineering Materials, Serope Kalpakjian, Steven R. Schemid, Fourth edition, Pearson Education.
2. Manufacturing Engineering and Technology, Serope Kalpakjian, Third Edition, Addison-Wesley Publication Co.,
3. Materials and Processes in Manufacturing, E.P. DeGarmo, J. T Black, R.A. Kohser, 8th Edition, Prentice Hall of India, New Delhi (ISBN 0-02-978760).
4. Manufacturing Science, A. Ghosh & A.K. Mallik, East-West Press Pvt. Ltd. New Delhi.
5. Non-traditional Manufacturing Processes, G.F. Benedict, Marcel Dekker, Inc. New York (ISBN 0-8247-7352-7)
6. Advanced Machining Processes, V.K. Jain, Allied Publishers Pvt. Ltd.
7. Modern Machining Processes, P.C Pandey & H.S. Shan, McGraw Hill Education.
8. Manufacturing Technology, P. N Rao, Tata McGraw Hill Publishing Company.
9. Non-Conventional Machining, P. K Mishra, Narosa Publishers.
10. Unconventional Manufacturing Processes, K. K Singh, Dhanpat Rai & Company, New Delhi.



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Course Name & Semester	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME				CREDITS
			L	T	P	INTERNAL ASSESSMENT		ESE	SUB-TOTAL	
						CT-I	CT-II			
B. Tech. VII Sem.	IP07TOE23	Maintenance Management	3	-	-	15	15	70	100	3

COURSE LEARNING OBJECTIVES:

The objective of this course is to:

- To develop the skill of maintenance functions in industry.
- To provide the concept of various types of maintenance system used in industries.
- To impart knowledge on reasons for failure and the corrective and preventive measure adopted to reduce them.
- To create the ability of data, analyze failure cause and reliability engineering.
- To develop the new techniques of maintenance for minimizing the cost of maintenance and improving of life of equipment's.

COURSE OUTCOMES:

At the end of the course the students will be able to:

- Understand and be able to explain the aim and basics of maintenance activity.
- Use various methods of maintenance and procedures applied to equipment's.
- Be aware of methods of detection for faults and errors in operations.
- Apply the tools and techniques of repairing, faults analysis.

COURSE CONTENT:

MODULE - I

Introduction: Fundamentals of maintenance engineering, maintenance engineering its importance in material & energy conservation, inventory control, productivity, safety, pollution control etc. safety regulations, pollution problems, human reliability, total quality management (TQM), total productivity maintenance (TPM), environmental issues in maintenance, ISO 9000,

MODULE - II

Maintenance management: Types of maintenance strategies, Planned and unplanned maintenance, breakdown, preventive & predictive maintenance and their comparison, advantages & disadvantages, limitations of computer aided maintenance, maintenance scheduling, spare part management, inventory control, organization of maintenance department.

MODULE - III



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Tribology in maintenance: Friction wear and lubrication, friction & wear mechanisms, prevention of wear, types of lubrication mechanisms, lubrication processes.

Lubricants: Types, general and special purpose, additives, testing of lubricants, degradation of lubricants, seal & packing.

MODULE - IV

Machine health monitoring: Condition based maintenance, signature analysis, oil analysis, vibration, noise and thermal signatures, on line & off line techniques, instrumentation & equipment used in machine health monitoring. instrumentation in maintenance, signal processing, data acquisition and analysis, application of intelligent systems, data base design.

TPM: Introduction, history, components, pillars of TPM, calculation of OEE, Terri technology.

MODULE - V

Reliability, availability & maintainability (RAM) analysis: Introduction to RAM failure mechanism, failure data analysis, failure distribution, reliability of repairable and non-repairable systems, improvement in reliability, reliability testing, reliability prediction, utilization factor, system reliability by Monte Carlo simulation technique, FMECA.

TEXT & REFERENCE BOOKS:

1. Maintenance Engineering Hand Book, Higgins.
2. Maintenance & Spare parts Management, Gopal Krishnan.
3. Industrial Maintenance Management, S.K. Shrivastava.
4. Industrial Engineering, Hand book of Condition Monitoring, C.N.R. Rao.



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Course Name & Semester	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME			CREDITS
			L	T	P	INTERNAL ASSESSMENT	ESE	SUB-TOTAL	
B. Tech. VII Sem.	IP07TMC02	Indian Constitution	3	-	-	-	-	-	-

COURSE LEARNING OBJECTIVES:

The objective of this course is to:

- To help the students to understand and explain the fundamental rights.
- To describe the uses of directive principle.
- Importance of union executives.
- Describe the composition of legislative assembly, its powers and functions.

COURSE OUTCOMES:

At the end of the course the students will be able to:

- Understand the meaning and importance of constitution.
- Identify and explore the basic features and modalities about Indian constitution.
- Realize the state and central policies (union and state executive), fundamental rights & their duties.
- Analyze the salient (outstanding) features of Indian constitution.
- Recognize the importance and significance of preamble with respect to Indian constitution.

MODULE – I

Introduction: Constitution-meaning of the term, sources and constitutional theory, features, citizenship preamble.

MODULE – II

Fundamental rights and duties: Fundamental rights, fundamental duties, directive principles of state policy.

MODULE – III

Union government: Structure of Indian union: federalism, Centre-state relationship President: role, power and position, Prime minister and council of ministers, cabinet and central secretariat, Lok Sabha, Rajya Sabha.

MODULE – IV

State Government: Governor: role and position, chief minister and council of ministers, state secretariat.

MODULE -V



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SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

Department of Industrial & Production Engineering

CBCS-New, Study & Evaluation Scheme W.E.F. Session: 2021-22

B. TECH FOURTH YEAR, VIII SEMESTER

SN	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME			CREDITS
			L	T	P	INTERNAL ASSESSMENT	ESE	SUB-TOTAL	
1.	IP08TPC16	Robotics and Robot Applications	3	1	-	30	70	100	4
2.	IP08THS04	Electives from Humanity Science-04	3	-	-	30	70	100	3
3.	IP08TOE03	Open Elective-03	3	-	-	30	70	100	3
4.	IP08TOE04	Open Elective-04	3	-	-	30	70	100	3
5.	IP08TMC03	Essence of Indian Traditional Knowledge	3	-	-	-	-	-	-
Total			15	1	-	120	280	400	13
PRACTICALS									
1.	IP08PPR02	Major Project	-	-	12	120	80	200	6
2.	IP08PPC01	Comprehensive Viva	-	-	-	-	50	50	2
Total			-	-	12	120	130	250	8

Total Credits: 21

Total Contact Hour: 28

Total Marks: 650

INTERNAL ASSESSMENT: -two class tests of 15 marks each will be conducted.

L-LECTURE, T-TUTORIAL, P-PRACTICAL, ESE -END SEMESTER EXAMINATION

IP08THS04 Electives from Humanity Science-04
IP08THS41 Intellectual Property Rights
IP08THS42 Safety Management and Labour Law
IP08TOE03 Open Elective-03
IP08TOE31 Computer Aided Process Planning
IP08TOE32 Microprocessors in Automation
IP08TOE04 Open Elective-04
IP08TOE41 Supply Chain Management
IP08TOE42 Composite Materials Technology



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Course Name & Semester	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME				CREDITS
			L	T	P	INTERNAL ASSESSMENT		ESE	SUB-TOTAL	
						CT-I	CT-II			
B. Tech VIII Sem.	IP08THS41	Intellectual Property Rights	3	-	-	15	15	70	100	3

COURSE LEARNING OBJECTIVES:

The objective of this course is to:

- Understand, define and differentiate various types of intellectual properties (IPs) and their roles in contributing to organizational competitiveness.
- Understand the framework of strategic management of Intellectual Property (IP).
- Appreciate and appraise different IP management (IPM) approaches and describing how pioneering firms initiate, implement and manage IPM programs.
- Explain how to derive value from IP and leverage its value in new product and service development.

COURSE OUTCOMES:

At the end of the course the students will be able to:

- Identify the different types of Intellectual properties (IPs), the right of ownership and scope of protection.
- Recognize the crucial role of IP in organizations of different industrial sectors for the purposes of product and technology development.
- Identify activities and constitute IP infringements and the remedies available to the IP owner and describe the precautionary steps to be taken to prevent infringement of proprietary rights in products and technology development.
- Analyze ethical and professional issues which arise in the intellectual property right context.
- Apply intellectual property right principles (including copyright, patents, designs and trademarks) to real problems and analyze the social impact of intellectual property rights.
- Demonstrate a capacity to identify, apply and assess ownership rights and marketing protection under



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intellectual property law as applicable to information, ideas, new products and product marketing.

COURSE CONTENT:

MODULE - I

Introduction to intellectual property: Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

MODULE - II

Trademarks: Purpose and function of trademarks, acquisition of trademarks rights, protectable matter, selecting and evaluating trademark, trademark registration processes.

MODULE - III

Law of copyrights and law of patents: Fundamentals of copyrights law, originality of material, rights to reproduction, rights to perform the work publicly, copyright ownership issues, copyright registration, notice of copyright, international copyright law, foundation of patent law, patent searching process, ownership rights and transfer.

MODULE - IV

Trade secrets and unfair competition: Trade secrets law, determination of trade secrets status, liability for misappropriations of trade secrets, protection for submission, trade secrets litigation, misappropriation of right of publicity and false advertising.

MODULE - V

New developments of intellectual property: New developments in trade law, copyright law, patent law, intellectual property audits international overview of intellectual property, international-trademark law, copyright law, international patent law, international development in trade secrets law.

TEXT & REFERENCE BOOKS:

1. Intellectual Property Right, Deborah. E. Bouchoux, 4th Edition, 2013, Cengage Learning.
2. Intellectual Property Right: Unleashing the Knowledge Economy, Prabuddha Ganguli, 3 rd Edition, 2005, Tata McGraw Hill Publishing Company Ltd.,



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Course Name & Semester	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME				CREDITS
			L	T	P	INTERNAL ASSESSMENT		ESE	SUB-TOTAL	
						CT-I	CT-II			
B.Tech VIII Sem.	IP08TOE31	Computer Aided Process Planning (CAPP)	3	-	-	15	15	70	100	3

COURSE LEARNING OBJECTIVES:

The objective of this Course is to:

- Learn the fundamentals of computer aided process planning, group technology and applications.
- Study the simulation of machining processes, importance of design and manufacturing tolerances.
- Understand the role of optimal selection of machining parameters.

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.

COURSE CONTENT:

MODULE -I

Introduction to CAPP: Information requirement for process planning system, role of process planning, advantages of conventional process planning over CAPP, structure of automated process planning system, feature recognition, methods.

MODULE – II

Generative CAPP system: Importance, principle of generative CAPP system, automation of logical decisions, knowledge-based systems, inference engine, implementation, benefits.

Retrieval CAPP system: Significance, group technology, structure, relative advantages, implementation, and applications.



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MODULE – III

Selection of manufacturing sequence: Significance, alternative-manufacturing processes, reduction of total set-up cost for a particular sequence, quantitative methods for optimal selection, examples.

MODULE – IV

Determination of machining parameters: Reasons for optimal selection of machining parameters, effect of parameters on production rate, cost and surface quality, different approaches, advantages of mathematical approach over conventional approach, solving optimization models of machining processes.

MODULE – V

Generation of tool path: Simulation of machining processes, NC tool path generation, graphical implementation, determination of optimal index positions for executing fixed sequence, quantitative methods.

TEXT & REFERENCE BOOKS:

1. Automation, Production systems & Computer Integrated Manufacturing System, Mikell P. Groover, PHI Publication.
2. Computer Aided Engineering, David Bedworth, TMH Publishers
3. Computer Aided Design and Manufacturing, Sadhu Singh, Khanna Publisher.
4. Computer Aided Process Planning, H.P. Wang and J.K. Li, Elsevier Science and Technology Publishers, 1st edition, 1991.
5. Computer Aided Process Planning, Joseph Tulkoff, SME Publications.



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Course Name & Semester	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME				CREDITS
			L	T	P	INTERNAL ASSESSMENT		ESE	SUB-TOTAL	
						CT-I	CT-II			
B.Tech VIII Sem.	IP08TOE32	Microprocessors in Automation	3	-	-	15	15	70	100	3

COURSE LEARNING OBJECTIVES:

The objective of this course is to:

- To understand the fundamentals of PIC microcontroller.
- Understand the working of microcontroller systems and able to determine its hardware and software.
- Interface with real time systems.
- Understand the design application based on microprocessors systems.

COURSE OUTCOMES:

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

- Learn embedded system and its applications in industry.
- Recognise working of microcontroller architecture and programming model.
- Identify the concept of timer, interrupt, I/O port interfacing with microcontroller.
- Study the concept of interfacing with real time system.

COURSE CONTENT:

MODULE - I

Number Systems: Codes, digital electronics, logic gates, combinational circuits design, flip-flops, sequential logic circuits design, counters, shift registers.

Introduction to 8085 functional block diagram, registers, ALU, bus systems, timing and control signals.

MODULE - II

Machine cycles: Instruction cycle and timing states, instruction timing diagrams, memory interfacing.

MODULE - III

Assembly language programming: Addressing modes, instruction set, simple programs in 8085, concept of interrupt, need for interrupts, interrupt structure, multiple interrupt requests and their handling, programmable interrupt controller, interfacing peripherals, programmable peripheral interface (8255).

MODULE - IV

Interfacing analog to digital converter & digital to analog converter, multiplexed seven segments LED display systems, stepper motor control, data communication: serial data communication (8251),



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programmable timers (8253), 8086/8088 microprocessor and its advanced features.

MODULE - V

Introduction to digital control: Sampling theorem, signal conversion and processing, Z-transform, digital filters, implementation of digital algorithm.

TEXT & REFERENCE BOOKS:

1. Digital Electronics: An Introduction to Theory and Practice, William H. Gothmann, PHI Learning Private Limited.
2. Digital Computer Electronics: An Introduction to Microcomputers, Albert Paul Malvino, Tata McGraw-Hill Publishing Company Ltd.
3. Microprocessor Architecture, Programming, and Applications with the 8085, Ramesh Gaonkar, PENRAM International Publishers.
4. Digital Control Systems, Benjamin C. Kuo, Oxford University Press (2/e, Indian Edition).
5. Microcomputer Experimentation with the Intel SDK-85, Lance A. Leventhal, Prentice Hall.



DEPARTMENT OF INDUSTRIAL & PRODUCTION ENGINEERING, GGVV, BILASPUR CG

Course Name & Semester	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME				CREDITS
			L	T	P	INTERNAL ASSESSMENT		ESE	SUB-TOTAL	
						CT-I	CT-II			
B.Tech VIII Sem.	IP08TMC03	Essence of Traditional Knowledge	3	-	-	-	-	-	-	-

COURSE LEARNING OBJECTIVES:

- The course aims at imparting basic principles of thought process, reasoning and inferencing. sustainability is at the core of Indian traditional knowledge systems connecting society and nature.
- Holistic life style of yogic-science and wisdom capsules in Sanskrit literature are also important in modern society with rapid technological advancements and societal disruptions.
- The course focuses on introduction to Indian knowledge system, Indian perspective of modern scientific world-view and basic principles of yoga and holistic health care system.

COURSE OUTCOMES:

- Ability to understand, connect up and explain basics of Indian traditional knowledge modern scientific perspective.

COURSE CONTENT:

- Basic structure of Indian knowledge system: ऋषिदशविद्या - ऋग्वेद, ऋग्वेद (आयुर्वेद, धनुर्वेद, गन्धर्ववेद, स्थापत्य आदि) ऋग्वेदांग (शिक्षा, कल्प, निरुक्त, ज्योतिष, छंद) ऋग्वेदांग (धर्मशास्त्र, मीमांसा, पुराण, तर्कशास्त्र).
- Modern science and Indian knowledge system.
- Yoga and holistic health care.
- Case studies.

TEXT & REFERENCE BOOKS:

1. Cultural Heritage of India-course material, V. Sivaramakrishnan (Ed.), Bharatiya Vidya Bhavan, Mumbai 5th Edition, 2014.
2. Modern Physics and Vedant, Swami Jitatanand, Bharatiya Vidya Bhavan.
3. Tao of Physics, Fritz of Capra.
4. Tarkasangraha of Annam Bhatta, V.N. Jha (Eng. Trans.), International Chinmay Foundation, Velliarnad, Amakulam.
5. Yoga Sutra of Patanjali, Ramakrishna Mission, Kolkata.
6. Yoga-darshanam with Vyasa Bhashya, G.N. Jha (Eng. Trans.), Ed. R.N. Jha, Vidyanidhi Prakashan, Delhi 2016.