



RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

SCHEME OF STUDIES & EXAMINATIONS (IMPLEMENTED FROM SESSION: JULY 2023)

SCHEME OCBC JULY 2022/2023 NAME OF BRANCH
PRODUCTION ENGINEERING

BRANCH CODE P05

SEMESTER SIXTH (VI)

П			THEORY COMPONENT PRACTICAL COMPONENT															
				EK		TERM WOR			RK THEORY PAPER		RY PAPER	×			PRACTICAL EXAM/VIVA		ITS	IKS
S.N.	PAPER CODE	SUBJECT CODE	SUBJECT NAME	HRS PER WEEK	CREDITS	QUIZ/ASSIGNMENT	M TEF TES	RM	TOTAL	MARKS	DURATION	HRS PER WEEK	CREDITS	LAB WORK	MARKS	DURATION	TOTAL CREDITS	TOTAL MARKS
1	7386	601	ENTREPRENEURSHIP AND START-UPS	4	4	10	10	10	30	70	03 Hrs.	0	0	0	0	0	4	100
П	7550	602	TOOL ENGINEERING	5	5	10	10	10	30	70	03 Hrs.	0	0	0	0	0	5	100
2	7551	603	INDUSTRIAL EQUIPMENT MAINTENANCE	5	5	10	10	10	30	70	03 Hrs.	0	0	0	0	0	5	100
3	7603	611	DISASTER MANAGEMENT OR	3	3	10	10	10	30	70	03 Hrs.	0	0	0	0	0	3	100
	7604	612	PROJECT MANAGEMENT	L ³	٥	10	10	10	30	70	US 1115.	0	٥	U	0	U	Э	100
	7605	621	ARTIFICIAL INTELLIGENCE OR															
4	7606	622	ENGINEERING ECONOMICS AND ACCOUNTANCY	3	3	10	10	10	30	70	03 Hrs.	0	0	0	0	0	3	100
6			INDIAN CONSTITUTION	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7			MAJOR PROJECT **	0	0	0	0	0	0	0	0	6	4	100	50	03 Hrs.	4	150
8			SEMINAR***	3	1	50	0	0	50	0	0	0	0	0	0	0	1	50
9	9 LIBERARY/VISITS etc.		0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	
			TOTAL	25	21				200	350		11	4	100	50		25	700

NOTE - (1)* Two Best, out of Three Mid Term Tests (Progressive Tests) Marks should be entered here.

(2)** One Credit is carried forward from the Vth semester major project evaluation.

(3)*** One Hour Time duration for each student.

GRAND TOTAL OF CREDITS
25

GRAND TOTAL OF MARKS 700



DIPLOMA IN PRODUCTION ENGINEERING (P05)

SEMESTER VI

COURSE TITLE	:	ENTREPRENEURSHIP AND START-UPS
PAPER CODE	:	7386
SUBJECT CODE	:	601
TREORY CREDITS	:	04
PRACTICAL CREDITS	:	00

Course Learning Objectives:

- 1. Acquiring Entrepreneurial spirit and resourcefulness.
- 2. Familiarization with various uses of human resource for earning dignified means of living.
- 3. Understanding the concept and process of entrepreneurship its contribution and role in the growth and development of individual and the nation.
- 4. Acquiring entrepreneurial quality, competency, and motivation.
- 5. Learning the process and skills of creation and management of entrepreneurial venture.

Course Content:

Unit 1 - Introduction to Entrepreneurship and Start - Ups

- Definitions, Traits of an entrepreneur, Intrapreneurship, Motivation
- Types of Business Structures, Similarities/differences between entrepreneurs and managers.

Unit 2 – Business Ideas and their implementation

- Discovering ideas and visualizing the business
- Activity map
- Business Plan

Unit 3 – Idea to Start-up

- Market Analysis Identifying the target market,
- Competition evaluation and Strategy Development,
- Marketing and accounting,
- · Risk analysis

Unit 4 – Management

- Company's Organization Structure,
- Recruitment and management of talent.
- Financial organization and management

Unit 5 - Financing and Protection of Ideas

- Financing methods available for start-ups in India
- Communication of Ideas to potential investors Investor Pitch
- Patenting and Licenses

Unit 6: Exit strategies for entrepreneurs, bankruptcy, and succession and harvesting strategy

Learning Outcome:

Upon completion of the course, the student will be able to demonstrate knowledge of the following topics:

- 1. Understanding the dynamic role of entrepreneurship and small businesses
- 2. Organizing and Managing a Small Business
- 3. Financial Planning and Control
- 4. Forms of Ownership for Small Business
- 5. Strategic Marketing Planning
- 6. New Product or Service Development
- 7. Business Plan Creation

SUGGESTED LEARNING RESOURCES:

S. No.	Title of Book	Author	Publication		
1.	The Startup Owner's Manual: The Step-by-Step Guide for Building a Great		K & S Ranch ISBN - 978-0984999392		
	Company				
2.	The Lean Startup: How Today's Entre-	Eric Ries	Penguin UK		
	preneurs Use Continuous Innovation to Create Radically Successful Businesses		ISBN - 978-0670921607		
3.	Demand: Creating What People Love	Adrian J. Slywotzky	Headline Book Publishing		
Before They Know They Want It		with Karl Weber	ISBN - 978-0755388974		
4.	The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business	Clayton M. Christensen	Harvard business ISBN: 978-142219602		

SUGGESTED SOFTWARE/LEARNING WEBSITES:

- a. https://www.fundable.com/learn/resources/guides/startup
- b. https://corporatefinanceinstitute.com/resources/knowledge/finance/corporate-structure/
- c. https://www.finder.com/small-business-finance-tips
- d. https://www.profitbooks.net/funding-options-to-raise-startup-capital-for-your-business/

DIPLOMA IN PRODUCTION ENGINEERING (P05)

SEMESTER VI

COURSE TITLE	:	TOOL ENGINEERING
PAPER CODE	:	7550
SUBJECT CODE	:	602
TREORY CREDITS	:	05
PRACTICAL CREDITS	:	00

Course Learning Objectives:

- To understand the concepts of cutting tools and cutting forces involved in metal cutting process.
- To understand tool angles of various cutting tools & their importance.
- To understand and evaluate the tool wear and tool life with the help of Taylors tool life equation.
- To understand the types of press, forming dies and their constructions.
- To understand the designing of strip layout for given component.

Course Content:

UNIT-I: Jigs and fixtures: – Necessity for jigs and fixtures - Elements of fixtures, design considerations, locators, types of locators, clamping and guiding devices, swarf disposal methods

UNIT-II: Work holding devices for flat, round and irregular surface: Design of drill jigs, bush specifications. Fixture for lathe operations, milling, broaching and welding fixtures, fixtures for CNC machines, modular fixtures.

UNIT-III: Press working: tools, blanking and piercing tools, load variation during blanking-Calculation of press tonnage for blanking and piercing. Types of dies, simple, compound, combination and progressive dies- Design of compound and progressive dies. Bending and drawing dies: Bending allowances, bending methods. Bending pressure-calculation of blank size and press tonnage for drawing, metal flow during drawing operations - Fine blanking, Embossing and Coining.

UNIT-IV: Tool for forging, Design of drop forging dies: - Rolling, strip rolling theory, stress distribution in rolling, Roll separation force and torque. Forces acting on single point and multiple point cutting tools

UNIT-V: CAD for tooling: Turret press FMS-Computer applications (CAD / CAM) in short metal press work – Quick die change method – Single minute exchange of dies- group tooling –Design of single point tools – Plastic as a tooling materials – Fluidized bed fixturing.

Reference Books:

- 1. Tool Design Cysil Donaldson TMH
- 2. Tool Design Cole G.B.
- 3. Die Design Hand Book ASTME
- 4. Jigs and Fixtures Calving-Hoose
- 5. Jig and Fixture Design Hand Book William and Boyes
- 6. Fundamentals of tool design ASTME & Edward G. Hoffman

- 7. Fundamentals of Fixture Design V. Koraskove Mir.
- 8. Metal Hand Book- ASM

Course outcomes:

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

CO1	Select cutting tools and its material using data book and manufacturer's catalogue.					
CO2	Estimate tool wear and tool life.					
CO3	Use press tools and dies effectively.					
CO4	Design strip layout for given component.					
CO5	Decide appropriate cutting fluid for machining process improvement.					



DIPLOMA IN PRODUCTION ENGINEERING (P05)

SEMESTER VI

COURSE TITLE	:	INDUSTRIAL EQUIPMENT MAINTENANCE
PAPER CODE	:	7551
SUBJECT CODE	:	603
TREORY CREDITS	:	05
PRACTICAL CREDITS	:	00

Course Learning Objectives:

- To achieve minimum breakdown and to keep the plant in good working condition at the lowest possible cost.
- Machines and other facilities should be kept in such a condition which permits them to be used at their optimum (profit making) capacity without any interruption or hindrance.
- Maintenance division of the factory ensures the availability of the machines, buildings and services required by other sections of the factory for the performance of their functions at optimum return on investment whether this investment be in material, machinery or personnel.

Course Content:

UNIT-I: Introduction: Maintenance, Need of Maintenance Management, Maintenance Policies, Strategies and options in Maintenance management. Maintenance forms/actions and their inter relationships, Brief descriptions of various Maintenance actions.

UNIT-II: Maintenance Organizations: Prerequisities, factors determining effectiveness of a Maintenance organization, objectives of organization design, types of organization. Maintenance Planning and Control: Establishing a Maintenance Plan-Preliminary consideration, Systematic method of Maintenance Plan and schedule planning and schedule of Plant shut downs

UNIT-III: Maintenance practices on production machines: Lathe, Drilling, Milling, Welding, Shaper. Use of computer in maintenance, Machine Reconditioning. Evaluation of Maintenance Management: Need for evaluation a to z objectives, criterion of evaluation.

UNIT-IV: Spare Parts Management: Capacity utilization, cost reduction approach to spares, reliability and quality of spares, spare parts procurement, inventory control of spare parts.

UNIT-V: Introduction: friction, wear and lubrication, Historical background, Purpose of lubrication, Lubrication regimes, Characteristics of lubricants - viscosity, viscosity index, oxidation stability, flash

point and fire point, pour point and cloud point, carbon residue, ash content, iodine value, neutralization number, dielectric strength, Composition and classification of lubricants, Lubricating oils – oil refining, types, categories, grading, Grease - composition, function, characteristics, thickeners and additives, soap and its complexes, selection and its practices, solid lubricants, Functional additives – surface, performance enhancing, lubricant protective, Lubricants applications – tribological components and industrial machinery, Lubricants testing and test methods, Organization and management of lubrication, lubricant storage and handling, Safety and health hazards, Environmental regulations.

Reference Books:

- 1. Maintenance Management Policies, Strategies and Options: July 27–29, 2000, Lecture notes MACT, Bhopal.
- 2. Maintenance & Spare Parts Management, P. Gopal Krishnan & A.K. Banerji
- 3. Hand Book of Reliability Engineering & Management: W. Grant Ireson and Clyde F McGraw Hill
- 4. Maintenance Planning & Control: Anthony Kelley East West Press.

Course outcomes:

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

CO1	Demonstrates the proper use of safety equipment, devices, and procedures in classroom and lab environments
CO2	Understanding of the Industrial Equipment Maintenance and practical laboratory experience to set up and repair industrial equipment and facilities
CO3	Compares and contrasts the operations of various industrial machines
CO4	Applies theoretical study and the knowledge of metering tools to troubleshoot mechanical, electrical, and electromechanical systems and repair them
CO5	Understand the friction, wear and lubrication properties at mating parts of machines and its tribological characteristics



DIPLOMA IN PRODUCTION ENGINEERING (P05)

SEMESTER VI

COURSE TITLE	:	DISASTER MANAGEMENT
PAPER CODE	:	7603
SUBJECT CODE	:	611
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	00

Course Learning Objectives:

Following are the objectives of this course:

- To learn about various types of natural and man-made disasters.
- To know pre- and post-disaster management for some of the disasters.
- To know about various information and organisations in disaster management in India.
- To get exposed to technological tools and their role in disaster management.

Course Content:

Unit - I: Understanding Disaster

Understanding the Concepts and definitions of Disaster, Hazard, Vulnerability, Risk, Capacity – Disaster and Development, and disaster management.

Unit - II: Types, Trends, Causes, Consequences and Control of Disasters

Geological Disasters (earthquakes, landslides, tsunami, mining); Hydro-Meteorological Disasters (floods, cyclones, lightning, thunder-storms, hail storms, avalanches, droughts, cold and heat waves) Biological Disasters (epidemics, pest attacks, forest fire);

Technological Disasters (chemical, industrial, radiological, nuclear) and Manmade Disasters (building collapse, rural and urban fire, road and rail accidents, nuclear, radiological, chemicals and biological disasters) Global Disaster Trends – Emerging Risks of Disasters – Climate Change and Urban Disasters.

Unit- III: Disaster Management Cycle and Framework

Disaster Management Cycle - Paradigm Shift in Disaster Management.

Pre-Disaster – Risk Assessment and Analysis, Risk Mapping, zonation and Microzonation, Prevention and Mitigation of Disasters, Early Warning System; Preparedness, Capacity Development; Awareness.

During Disaster – Evacuation – Disaster Communication – Search and Rescue – Emergency Operation Centre – Incident Command System – Relief and Rehabilitation –

Post-disaster – Damage and Needs Assessment, Restoration of Critical Infrastructure – Early Recovery – Reconstruction and Redevelopment; IDNDR, Yokohama Stretegy, Hyogo Framework of Action.

Unit-IV: Disaster Management in India

Disaster Profile of India - Mega Disasters of India and Lessons Learnt.

Disaster Management Act 2005 - Institutional and Financial Mechanism,

National Policy on Disaster Management, National Guidelines and Plans on Disaster Management; Role of Government (local, state and national), Non-Government and Inter Governmental Agencies

Unit- V: Applications of Science and Technology for Disaster Management

Geo-informatics in Disaster Management (RS, GIS, GPS and RS).

Disaster Communication System (Early Warning and Its Dissemination).

Land Use Planning and Development Regulations, Disaster Safe Designs and Constructions, Structural and Non Structural Mitigation of Disasters

S&T Institutions for Disaster Management in India

References

- 1. Publications of National Disaster Management Authority (NDMA) on Various Templates and Guidelines for Disaster Management
- 2. Bhandani, R. K., An overview on natural & man-made disasters and their reduction, CSIR, New Delhi
- 3. Srivastava, H. N., and Gupta G. D., Management of Natural Disasters in developing countries, Daya Publishers, Delhi
- 4. Alexander, David, Natural Disasters, Kluwer Academic London
- 5. Ghosh, G. K., Disaster Management, A P H Publishing Corporation
- 6. Murthy, D. B. N., Disaster Management: Text & Case Studies, Deep & Deep Pvt. Ltd.

Course outcomes:

After competing this course, student will be:

- Acquainted with basic information on various types of disasters
- Knowing the precautions and awareness regarding various disasters
- Decide first action to be taken under various disasters
- Familiarised with organisation in India which are dealing with disasters
- Able to select IT tools to help in disaster management



DIPLOMA IN PRODUCTION ENGINEERING (P05)

SEMESTER VI

COURSE TITLE	:	PROJECT MANAGEMENT
PAPER CODE	:	7604
SUBJECT CODE	:	612
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	00

Course Learning Objectives:

- To develop the idea of project plan, from defining and confirming the project goals and objectives, identifying tasks and how goals will be achieved.
- To develop an understanding of key project management skills and strategies.

Course Content:

UNIT-I: Concept of a project: Classification of projects- importance of project management- The project life cycle- establishing project priorities (scope-cost-time)project priority matrix- work break down structure.

UNIT-II: Capital budgeting process: Planning- Analysis-Selection-Financing-Implementation-Review. Generation and screening of project ideas- market and demand analysis- Demand forecasting techniques. Market planning and marketing research process- Technical analysis

UNIT-III: Financial estimates and projections: Cost of projects-means of financing-estimates of sales and production-cost of production-working capital requirement and its financing-profitability projected cash flow statement and balance sheet. Break even analysis.

UNIT-IV: Basic techniques in capital budgeting: Non discounting and discounting methods- payback period- Accounting rate of return-net present value-Benefit cost ratio-internal rate of return. Project risk. Social cost benefit analysis and economic rate of return. Non-financial justification of projects.

UNIT-V: Project administration: progress payments, expenditure planning, project scheduling and network planning, use of Critical Path Method (CPM), schedule of payments and physical progress, time-cost trade off.

Concepts and uses of PERT cost as a function of time, Project Evaluation and Review Techniques/cost mechanisms. Determination of least cost duration. Post project evaluation. Introduction to various Project management softwares.

Reference Books:

- 1. Project planning, analysis, selection, implementation and review Prasannachandra Tata McGraw Hill
- 2. Project Management the Managerial Process Clifford F. Gray & Erik W. Larson McGraw Hill
- 3. Project management David I Cleland Mcgraw Hill International Edition, 1999
- 4. Project Management Gopala krishnan Mcmillan India Ltd.
- 5. Project Management-Harry-Maylor-Peason Publication

Course outcomes:

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

CO1	Understand the importance of projects and its phases.				
CO2	Analyze projects from marketing, operational and financial perspectives.				
CO3	Evaluate projects based on discount and non-discount methods.				
CO4	Develop network diagrams for planning and execution of a given project.				
CO5	Apply crashing procedures for time and cost optimization.				



DIPLOMA IN PRODUCTION ENGINEERING (P05)

SEMESTER VI

COURSE TITLE	:	ARTIFICIAL INTELLIGENCE
PAPER CODE	:	7605
SUBJECT CODE	:	621
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	00

Course Content:

Unit 1 – Introduction to Artificial Intelligence

- Artificial Intelligence (AI) definition
- Goals of AI
- · History of AI
- · Applications of AI

Unit 2 - Agents and Environments

- Agent Terminology, Types of Agents Simple Reflex Agents, Model Based Reflex Agents, Goal Based Agents
- Nature of Environments, Properties of Environments

Unit 3 – Search Algorithms

Terminology

- Brute Force Search Strategies Breadth First Search, Depth First Search.
- Heuristic Search Strategies, Local Search Algorithms.

Unit 4 – Fuzzy Logic Systems

Introduction to Fuzzy Logic and Fuzzy systems,

- Membership functions,
- Fuzzification/Defuzzification

Unit 5 - Neural Networks

Basic structure of Neural Networks

- Perceptron
- Back-propagation

Suggested Learning Resources:

S. No.	Title of Book	Author	Publication
1	Artificial Intelligence By Example: Develop machine intelligence from scratch using real artificial intelli- gence use cases		Packt Publishing ISBN – 978-1788990547



DIPLOMA IN PRODUCTION ENGINEERING (P05)

SEMESTER VI

COURSE TITLE	:	ENGINEERING ECONOMICS AND ACCOUNTANCY
PAPER CODE	:	7606
SUBJECT CODE	:	622
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	00

Course Learning Objectives:

- To acquire knowledge of basic economics to facilitate the process of economic decision making.
- To acquire knowledge on basic financial management aspects.
- To develop the basic skills to analyze financial statements.

Course Content:

UNIT-I: Introduction: Managerial Economics; Relationship with other disciplines; Firms: Types, objectives and goals; Managerial decisions; Decision analysis.

Unit-II: Demand & Supply Analysis: Demand; Types of demand; Determinants of demand; Demand function; Demand elasticity; Demand forecasting; Supply; Determinants of supply; Supply function; Supply elasticity.

Unit-III: Production and Cost Analysis: Production function; Returns to scale; Production optimization; Least cost input; Isoquants; Managerial uses of production function; Cost Concepts; Cost function; Types of Cost; Determinants of cost; Short run and Long run cost curves; Cost Output Decision; Estimation of Cost.

Unit-IV: Pricing: Determinants of Price; Pricing under different objectives and different market structures; Price discrimination; Pricing methods in practice; Role of Government in pricing control.

Unit-V: Financial Accounting (Elementary Treatment): Balance sheet and related concepts; Profit & Loss Statement and related concepts; Financial Ratio Analysis; Cash flow analysis; Funds flow analysis; Comparative financial statements; Analysis & Interpretation of financial statements; Investments; Risks and return evaluation of investment decision; Average rate of return; Payback Period; Net Present Value; Internal rate of return,

Reference Books:

- Premvir Kapoor, Sociology & Economics for Engineers, Khanna Publishing House, New Delhi, 2018
- 2. McGuigan, Moyer and Harris, 'Managerial Economics; Applications, Strategy and Tactics', Thomson South Western, 10th Edition, 2005.
- 3. Prasanna Chandra. 'Fundamentals of Financial Management', Tata Mcgraw Hill Publishing Ltd., 4th edition, 2005.
- 4. Samuelson. Paul A and Nordhaus W.D., 'Economics', Tata Mcgraw Hill Publishing Company Limited, New Delhi, 2004.
- 5. Paresh Shah, 'Basic Financial Accounting for Management', Oxford University Press, New Delhi, 2007. 3. Salvatore Dominick, 'Managerial Economics in a global economy'. Thomson South Western, 4th Edition, 2001.

Course outcomes:

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

CO1	Understand the macro-economic environment of the business and its impact on enterprise
CO2	Understand cost elements of the product and its effect on decision making
CO3	Prepare accounting records and summarize and interpret the accounting data for managerial decisions
CO4	Understand accounting systems and analyze financial statements using ratio analysis
CO5	Understand the concepts of financial management and investment



DIPLOMA IN PRODUCTION ENGINEERING (P05)

SEMESTER VI

COURSE TITLE	:	INDIAN CONSTITUTION
PAPER CODE	:	
SUBJECT CODE	:	
TREORY CREDITS	:	00
PRACTICAL CREDITS	:	00

Course Content

Unit 1 – The Constitution - Introduction

- The History of the Making of the Indian Constitution
- Preamble and the Basic Structure, and its interpretation
- Fundamental Rights and Duties and their interpretation
- State Policy Principles

Unit 2 - Union Government

- Structure of the Indian Union
- President Role and Power
- Prime Minister and Council of Ministers
- Lok Sabha and Rajya Sabha

Unit 3 – State Government

- Governor Role and Power
- Chief Minister and Council of Ministers
- State Secretariat

Unit 4 - Local Administration

- District Administration
- Municipal Corporation
- Zila Panchayat

Unit 5 – Election Commission

- Role and Functioning
- Chief Election Commissioner
- State Election Commission

Suggested Learning Resources:

S. No.	Title of Book	Author	Publication
1.	Ethics and Politics of the Indian Constitution	Rajeev Bhargava	Oxford University Press, New Delhi, 2008
2.	The Constitution of India	B.L. Fadia	Sahitya Bhawan; New edition (2017)
3.	Introduction to the Constitution of India	DD Basu	Lexis Nexis; Twenty-Third 2018 edition

Suggested Software/Learning Websites:

- a. https://www.constitution.org/cons/india/const.html
- b. http://www.legislative.gov.in/constitution-of-india
- c. https://www.sci.gov.in/constitution
- $d.\ https://www.toppr.com/guides/civics/the-indian-constitution/the-constitution-of-india/$



DIPLOMA IN PRODUCTION ENGINEERING (P05)

SEMESTER - VI

COURSE TITLE	:	MAJOR PROJECT
PAPER CODE	:	
COURSE CODE	:	
TREORY CREDITS	:	00
PRACTICAL CREDITS	:	04 (03+01 Credit of the V Sem.)

MAJOR PROJECT

It should be based on real/live problems of the Industry/Govt./NGO/MSME/Rural Sector or an innovative idea having the potential of a Startup.

Evaluation is based on work done, quality of report, performance in vivavoce, presentation etc



DIPLOMA WING RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL DIPLOMA IN PRODUCTION ENGINEERING (P05)

SEMESTER VI

COURSE TITLE	:	SEMINAR
PAPER CODE	:	
COURSE CODE	:	
TREORY CREDITS	:	01
PRACTICAL CREDITS	:	00

SEMINAR

Evaluation is based on work done, quality of report, performance in Viva-voce, presentation etc.