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PUNE – 411018

CENTRE FOR ONLINE LEARNING

PIMPRI, PUNE

SYLLABUS FOR

MASTER OF BUSINESS ADMINISTRATION (M.B.A)

Academic Year 2025

Semester-III Operations Management Specialization

Semester	3	**Course Credits**	**4**	**Specialization**	Operations Management
Course Code	OMBO-301			**Type**	Specialization Course
Course Title	Production Planning & Control (PPC)				

Course Description:

To develop a broad conceptual framework based on the research, which has been done in the recent past and to bridge the gap between the theoretical solutions on one hand and the real- world problems on the other in production planning and control.

Course Objectives:

1) To understand the various components and functions of production planning and control such as work study, product planning, process planning, production scheduling, inventory control;and
2) To know the recent trends like Manufacturing Requirement Planning (MRP II) and Enterprise Resource Planning(ERP).

Course Outline:

Unit 1: Understanding the Project: Introduction to Project, Projects in Different Fields, Classification of Projects, Project Classification Based on Nature of Project, Characteristics of Project.

Unit 1: Production Planning and Control: Production Control, Role of Production Planning and Control, Objectives of Production Planning and Control, Significance, Functions, Factors Affecting Production Planning and Control, Symptoms of Poor Production Planning and Control, Organisation for PPC Function, Manufacturing Planning and Control, Measurement of Effectiveness, Production Planning and Control inServices.

Unit 2: Demand Management: Functions, Demand Planning, Demand Forecasting, Forecasting Techniques, Bullwhip Effect, Strategies for Demand Fluctuations, Demand Management in Services.

Unit 3: Sales & Operations Planning (SOP): Features, Objectives and Functions, Benefits, Process of SOP, Requirements for implementation, Implementation of SOP, Key Indicators of a Successful SOP

Unit 4: Capacity Planning: Meaning of Capacity, Types of Capacity, Capacity Management, Capacity Shortage, Factors Affecting Capacity, Capacity Planning, Capacity Planning and Product Life Cycle, Capacity Expansion Strategies.

Unit 5: Aggregate Planning: Capacity and Demand Balance, Aggregate Planning Strategies, Steps in Aggregate Planning, Use of QT in Aggregate Planning, Aggregate Planning in Services, Trends in Aggregate Planning.

Unit 6: Master Production Schedule: Objectives of the MPS, MPS and Production Plan, Key Terms in MPS, Output of MPS, Steps in MPS, Time Fences and Time Zones, Changing MPS, Evaluation of MPS.

Unit 7: Material Requirement Planning Schedule: MRP System, MRP Process, Lot Sizing Rules, MRP Computations, Regeneration and Net Change, Assumptions in MRP, Benefits of MRP, MRP Implementation, Software for MRP.

Unit 8: Production Activity Control: Concept of Production Activity Control, Functions of Production Activity Control, Role of Shop Planner, Information and Documents, Operations Scheduling, Loading, Sequencing, Dispatching, Input/Output Control.

Unit 9:High Volume Production Activity Control: Types of Production, Flow Production, Characteristics of Flow Production, Requirements of Flow Production, Planning and Control In Flow Production, Line Balancing, Terminology in Line Balancing, Line Balancing Methods, Line Balancing Procedure, Kilbridge and WesterMethod.

Unit 10: Job Shop Production Activity Control: Job Production, Characteristics of Job Shop Production, Complexity of Job Shop, Production Activity Control in Job Shop, Terminology in Job Shop Planning, Job Shop Scheduling, Sequencing Rules, Gantt Chart, Approaches to Job Shop Scheduling.

Unit 11: Sequencing Models: Meaning of Sequencing, Taxonomy of Sequencing Models, General Assumptions in Sequencing, Priority Rules for Job Sequencing, Factors Affecting Sequencing, Sequencing in Flow Shop, Johnson's Method, N Jobs- Three Machines Sequencing, Sequencing in Job Shop.

Unit 12: JIT and Kanban: Concept of JIT, Philosophy of JIT, Elements of JIT, JIT Purchasing, Application of JIT, Benefits, Limitations of JIT, Concept of Kanban, Objectives and Functions of Kanban, Dual Card Kanban, Pull System, Principles ofImplementation.

Unit 13: Project Scheduling: Characteristics of Project, Project Scheduling, Gantt Chart, Network Scheduling, PERT/CPM, Probabilistic Activity Time, Precedence Diagramming Method (PDM), Critical Chain Scheduling.

Unit 14:PPC in Service Industry: Characteristics of Service Business, Differences Between Service and Manufacturing, OPC in Service Industry, Effect of Poor Planning in Service Industry, OPC in Logistics Operations, Operation Planning in Entertainment Business, Operations Control at Air France, OPC in IT

Industry, OPC in Health Care.

Course Outcome:

On successful completion of the course the learner will be able to:

CO#	Cognitive Abilities	Outcomes
CO301.1	**Remember**	Learn basic the concepts of production planning & control.
CO301.2	**Analyse**	Exhibit recent trends of manufacturing requirement planning.
CO301.3	**Evaluate**	Easily implement 5 M concept into practice.
CO301.4	**Apply**	Implement various components and functions into practice.

Suggested Reading:

1. Thomas E Vollman, William L Berry, D Cay Whybark and F Roberts Jacob MANUFACTURING PLANNING AND CONTROL FOR SUPPLY CHAIN MANAGEMENT, Tata McGraw–Hill Publishing Company Ltd(2005)
2. Daniel Sipper, Robert L, Bulfin, Jr. PRODUCTION PLANNING, CONTROL AND INTEGRATION McGraw-Hill CompaniesInc.
3. Seetharama L Narsimhan, Dennis W McLeavy, Peter J Billington PRODUCTION PLANNING AND INVENTORY CONTROL Prentice Hall Of India Pvt Ltd, New Delhi (2003)
4. Landvater Darryl V WORLD CLASS PRODUCTION AND INVENTORY MANAGEMENTJohn Wiley and Sons, New York1997
5. H J Zimmermann, M G Sovereign QUANTITATIVE MODELS FOR PRODUCTION MANAGEMENT Englewood Cliffs N J: Prentice Hall 1974

Semester	3	**Course Credits**	**4**	**Specialization**	Operations Management
Course Code	OMBO-302			**Type**	Specialization Course
Course Title	Fundamentals of Project Management (FPM)				

Course Description:

To train scientists and managers in the practical application and modern tools and techniques of planning, scheduling, monitoring, and control of multiple projects.

Course Objectives:

1) To provide the students with a holistic and integrative view of projectmanagement;
2) To highlight the role of projects in modern day business organizations;and
3) To sensitize the students to the complexities of projectmanagement.

Course Outline:

Unit 1: Understanding the Project: Introduction to Project, Projects in Different Fields, Classification of Projects, Project Classification Based on Nature of Project, Characteristics of Project.

Unit 2: Project Management: Need for Project Management, Project Management Objectives, The Value of Project Management, Characteristics of Project Management, Phases in Project Management, Approaches to Project Management, Project Processes.

Unit 3: Project Management Content: Introduction to Project Management Contents, Project Management Life Cycle, Business Case, Project Management Resources.

Unit 4: Project Finance and Evaluation: Projects Finance, Estimation of Time and Costs in Project, Project Evaluation Using Cost Benefit Analysis, Feasibility Study, PESTEL Analysis.

Unit 5: Project Planning: Projects Planning Cycle, Project Planning Tools.

Unit 6: Project Organizing: Creating Organization Structures, Types of Organization Structures, Specialized Organization Structures, Projects Organizing Process, Project Management Office.

Unit 7: Project Scheduling and Control: Project Scheduling Inputs, Project Scheduling Process, Concurrent Project Management, Multi-Tasking, Project Crashing, Project Controlling, Earned Value Management, Project Accounting, Project Resource Management, Resource Leveling.

Unit 8: Project Quality: Understanding Quality Cost of Quality, Project Quality Costs, Dimensions of

Project Quality, Project Quality Plan, Components of a Project Quality Plan, Planning for Project Quality, Quality Control in Projects, Implementing Quality Control, Total Quality Management, ISO Standard on Project Management.

Unit 9: Project Contract: Understanding Contract, Elements of Contract, Contract Management, Types of Contract, Contract Process, Defining SOW for Project, Project Contracts from Financial Perspective, Subcontracting in Projects, Employer's Involvement in Subcontracts.

Unit 10: Project Procurement: Procurement Process, Procurement System, Acquisition Process, Procurement Performance, Procurement Methods, Purchasing, Turnkey Projects, Planning for Procurement, Selecting Supplier for Project, RobinsonModel.

Unit 11: Project Closing: Purpose of Project Closing, Elements of Project Closing, Turnover of Projects, Lessons Learned, Project Close Out Report, Post Implementation Review, Analyzing Project Results, Responsibilities of Project Leader, Project Closure Activities as Given by PMP.

Unit 12: Project Risk Management: Risk Management Concept, Principles of Risk Management, Risk Identification, Risk Assessment, Hierarchy of Risk, Risk Options, Risk Management Plan, Areas of Risk Management, Project Risk Management Process, Positive Risk Management, Risk Communication.

Unit 13: Special Cases in Project Management: Event Chain Methodology, Agile Project Management, Extreme Project Management, Software Project Management, Software Prototyping, V–Model, Spiral Model, Rapid Application Development, Dynamic Systems Development Method, Rational Unified Process, Test-Driven Development, Feature-Driven Development, Benefits Realization Management, Critical Chain Project Management.

Course Outcome:

On successful completion of the course the learner will be able to:

CO#	Cognitive Abilities	Outcomes
CO302.1	**Remember**	Learn various stages of project life cycle.
CO302.2	**Understand**	Understand resources needed in each stage of project life cycle.
CO302.3	**Analyse**	Easily analyse the cost analyses for project to be done.
CO302.4	**Evaluate**	Implement the skill of completing project depending on the task length.

Suggested Reading:

1. Project Management Body of Knowledge, Book by Project ManagementInstitute
2. Originally published: 1996, Author: Project Management Institute, ISBN: 978-1-62825- 184-5
3. The Art of Project Management, Book by ScottBerkun
4. Project Management: A Systems Approach to Planning, Scheduling, and Controlling by Harold Kerzner(Author)
5. Project Management for the Unofficial Project Manager: A Franklin Covey Title Book by James Wood, Kory Kogon, and SuzetteBlakemore

Semester	3	**Course Credits**	**4**	**Specialization**	Operations Management
Course Code	OMBO-303			**Type**	Specialization Course
Course Title	Logistics & Supply Chain Management (LSCM)				

Course Description:

This Course is designed to explain the basic theory and techniques of Supply Chain Management (SCM) to examine the issues and problems associated with SCM in changing the business environment and to show how SCM can improve an enterprises effectiveness and competitiveness.

Course Objectives:

1) To understand the importance ofSCM;
2) To know the various aspects of SCM;and
3) To study the current trends inSCM.

Course Outline:

Unit 1: Introduction to Supply Chain Management: The Management Concept and Evolution of SCM, What is SCM? The Basic SCM Model, Relationships in SCM, Significance of SCM, Case Studies, Fundamentals of Logistics Management.

Unit 2: Fundamentals of Supply Chain Management: Decision Phases in Supply Chain, The macro processes of Supply Chain, Push-Pull based SCMs, Morkov Chain,Different types of Logistics, SCM in Indian Industry, Reverse SCM and Logistics, and Other Related Topics.

Unit 3: Inventory Control Management and Supply Chain Management: Need for Holding Inventory, Types of Inventories, Inventory Under Conditions of Uncertainty, Symptoms of Poor Inventory Management, Significance of Inventory Control Management, Inventory Control Organization, Duties of Inventory Control Department, Conducting Inventory– Methods of Inventory Control, Selective Inventory Control, Inventory Management in India, Inventory Ratios, Service Level, Understocking and Overstocking Costs.

Unit 4: Economic Order Quantity: The Economic Order Quantity [EOQ], The Derivation of EOQ, Standard Deviation, Practical Inventory Systems, Methods of Computation of EOQ, Cost Sensitivity Analysis, Integrated EOQ-ABC Analysis, Economic Purchase Quantity, Practical Considerations of EOQ in terms of Rate of Receipt and Rate of Usage, Additional Problems on EOQ.

Unit 5: Stores Management and Supply Chain Management: Duties of the Store Officer, Interdepartmental Relations, Corporate Policy and Stores Management, Types of Stores, Warehouses, Store Organization, Store Layouts, Features of Good Store Keeping, Safety Measures, Training.

Unit 6: Stores in Supply Chain: Care of Materials, Features of Ideal Storage Equipment's, The Storage Equipment's, The Store Records, The Store Reports, The Store Ratios, The Store Audit, Disposal, Replacement Analysis.

Unit 7: IT Enabled Supply Chain: Types of SCM Software, Macro-Processes CRM, ISCM and SRM, Transaction Management with EDI, Supply Chain IT in Practice, E-Business and Supply Chain, E-Sourcing, Data Requirements from SCM, LegacySystems.

Unit 8: Material Handling and Transportation: Significance of MHT, Functions of MHT Management, Factors Influencing Transport Decisions, Various Modes of Transport, Design Options, Transportation During Trade-Offs, Routing and Scheduling, Material Handling, Material Handling Ratio, Principle of Unit Load and Concept of Containerization and Palletization, Containerization, Transportation Techniques, Material Handling Equipment's, Traffic Management, Total Cost of Transport, InsuranceManagement.

Unit 9: Strategic Fit: Implied Demand Uncertainty, Understanding the Capabilities of Supply Chain, Other Issues Affecting Strategic Fit, Drivers and Obstacles, Decision Making in Supply Chain, Designing Supply Chain Distribution Network, Design Patterns of Distribution Network.

Unit 10: Network Design in Supply Chain: Factors Affecting Network Design, A Framework for Network Design Decisions, Taking Supply Chain Decisions Under Uncertain Conditions, Forecasting Demand, Methods of Forecasting, Role Played by Aggregate Planning, Action Plan, Strategy, Aggregate Planning Implementation, Managing the Supply, Implementing Solutions.

Unit 11: Manufacturing and Supply Chain Management: Product Life Cycle, Item Management, Kanban Systems, Assembly Line, Basic MRP Logic.

Unit 12: Channels of Distribution: Functions Performed by Distribution Channel, Services to the Customer, Vertical Marketing Systems [VMS], Horizontal Marketing Systems [HMS], Multi-Channel Marketing Systems [MMS], The Internet, Distribution Channel Design, Factors Affecting Choice of Distribution Channel.

Unit 13: International Logistics: International Shipping, Multimodal Transport, Air Transport.

Unit 14: Advanced Topics in Supply Chain Management: Customer Relationship Management (CRM), Electronic Data Interchange (EDI), Business Telecommunication, Electronic Supply Chain Management (eSCM),

Supply Chain Software, Digital Content Management, Business Process Re-engineering (BPR), Decision Support Systems and SCM.

Course Outcome:

On successful completion of the course the learner will be able to:

CO#	Cognitive Abilities	Outcomes
CO303.1	**Remember**	Learn the importance of supply chain management.
CO303.2	**Understand**	Understand the basic concepts of supply chain management.
CO303.3	**Analyse**	Exhibit current trends in supply chain management.
CO303.4	**Apply**	Apply skills to implement various aspects of supply chain management.

Suggested Reading:

1. Oracle e-Business Suite, Manufacturing and Supply Chain Management OraclePress
2. Manufacturing Planning and Control for Supply Chain Management, F. Robert Jacobs, William Berry , D. Clay Whybark , Thomas Vollmann, McGraw-Hill Professional Publishing
3. Manufacturing, Planning and Control Systems for Supply Chain Management, William Berry , D. Clay Whybark , Thomas Vollmann McGraw-HillPublishing
4. Manufacturing Operations and Supply Chain Management – ALean Approach, David H. Taylor, David Brunt Cengage LearningPublishing
5. Supply Chain Design and Management: Strategic and Tactical Perspectives, Manish Govil, Jean-Marie Proth Academic Press

Semester	3	**Course Credits**	**4**	**Specialization**	Operations Management
Course Code	OMBO-304			**Type**	Specialization Course
Course Title	World Class Manufacturing (WCM)				

Course Description:

Consistent with the Shingo Principles of continuous improvement, the World Class Manufacturing (WCM) training program is designed to train individuals to improve employee morale, individual and company performance, and company profits at all levels of the organization by highlighting the value and non-value added activities.

Course Objectives:

1) To help students understand the global competitive environment being faced bymanufacturers;
2) To help students to know the impact of IT revolution on manufacturingcompetitiveness;
3) To help students understand the different international practices & models adopted by various organizations;
4) Understand various practices being taken up by Indian Industries;and
5) To help students know about the maintenance managementpractices.

Course Outline:

Unit 1: Overview of "World Class Manufacturing": Common characteristics of WCM**,** World Class Organization of Future**,** What it Takes to Stay World Class?**,**Emergence of "World Class" Concept**,** Case Studies.

Unit 2: Vision, Mission, Values, Business & Manufacturing Strategies: Mission Statement, Vision Statement, Values, Interrelationship Between Values, Mission, and Vision, Strategy, Vision, Mission, Competitive Advantage, Business Strategy, Manufacturing Strategy**,** Current Issues.

Unit 3: Organization Design, Human Resources, Technology, and Performance Measurement: Organization Design, Human Resource, Technology, and Performance Measurement

Unit 4: Information Systems, Management Direction, and OperationsCapabilities: Information Systems, Management Direction, Operating Model, OperatingCapabilities.

Unit 5: Quality: 'Quality', Total Quality Control, Quality Planning, Quality Control, Quality Improvements**,** Total Quality Management (TQM).

Unit 6: Customer Service: What is Customer Service?, Essentials of Customer Service, A Few Basic Rules About Customer Service, Tips for Better Customer Service, Finer Points of Excellent Customer Service, Secrets of Customer Service, Five Customer Service Trends You Can't Ignore, Customer Service Skills, Customer Relations Management (CRM), CRM for Small Business, Companies Known for Their Extraordinary CustomerService.

Unit 7: World Class Manufacturing: History of World Class Manufacturing, World Class Manufacturing Philosophy, World-Class Manufacturing Defined, Changing Scenario in Manufacturing, Framework for Continuous Improvement, Imperatives for Increased Productivity, Opportunities for Improvement, Actual Company Performance Improvements, Examples of World Class ManufacturingFirms.

Unit 8: Product and Process Design: Product, Product Design, R&D Strategies, Modern Approaches to Design & Development, Process, Process Analysis, Process Capability.

Unit 9: Waste Elimination: What is "Waste", Seven Wastes, Definition of 'Waste', Five 'S', Flexible Workforce, Equipment Maintenance, Total Productive Maintenance (TPM), Statistical Process Control (SPC), Poka Yoke, Reduced Set up Time, Just-In-time (JIT), Three 'Ms' (Muda, Mura, Muri).

Unit 10: Lean Six Sigma: Lean Manufacturing, Six Sigma, Execution Infrastructure for Lean Six Sigma Applications, Software used for Six Sigma, Tools for Lean Six Sigma.

Unit 11: Toyota Production System (TPS): History, Underlying Principles of TPS, The 14 Principles, Essential Features of TPS, Techniques used in TPS.

Unit 12: Contributions of Experts To WCM: Dr. Edward Deming, Seven Deadly Diseases, Quotations and Concepts of Deming, Philip Crosby, Shigeo Shingo, Kaoru Ishikawa, Michael Porter, Case Study:- The Silicon Valley Case, Value Chain, Four Corners Model, C. K. Prahlad, Stephen Covey, Peter Senge.

Unit 13: Modern Techniques: Theory of Constraints (TOC), Synchronous Manufacturing, Business Process Reengineering (BPR), Benchmarking, Knowledge Management, Game Theory, Flexible Machining System.

Course Outcome:

On successful completion of the course the learner will be able to:

CO#	Cognitive Abilities	Outcomes
CO304.1	**Remember**	Learn the global competitive environment.

CO304.2	**Understand**	Differentiate the role of IT and Manufacturing competitiveness.
CO304.3	**Analyse**	Exhibit international projects and techniques.
CO304.4	**Apply**	Apply the skills to implement maintenance management practices.

Suggested Reading:

1. World Class Manufacturing: The Lessons of Simplicity Applied by RichardJ. Schonberger,
2. Japanese Management Techniques: Nine Hidden Lessons in Simplicity. by RichardJ. Schonberger,
3. Operations Strategy: Focusing Competitive Excellence (Quantitative Methodsand Applied Statistics Series)by Peter W. Stonebraker and G. KeongLeong
4. Toyota Production System: Beyond Large-Scale Production by TaiichiOhno
5. Manufacturing Strategy: Text and Cases- TerryHill

Semester	3	**Course Credits**	**4**	**Specialization**	Operations Management
Course Code	OMBO-305			**Type**	Specialization Course
Course Title	Operations in Service Industry (OSM)				

Course Description:

Services are a predominant force in our society. The rapid and continuing growth in the service sector is providing marked opportunities for managers. Understanding the concepts of successfully managing, the service will provide a significant advantage to new graduates, who find themselves employed by a service-oriented firm.

Good service does not happen as a result of one extraordinary employee who goes out of the way to please a customer; good service should be properly planned and managed. Service operations management concerns the design, planning, direction, and control of all the facilities, processes and required activities to transform labour, capital, materials, energy, and skills into performance and delivery of service. Good service organization performs the operations functions of planning, scheduling, equipment operation, quality control, record keeping, and human resource management for maintaining efficient usefulness. This takes place while ensuring that the quality of the service is both high andconsistent.

Course Objectives:

1) To train students to manage and lead in all aspects of business. The Courses specifically emphasize each of these areas and others essential for developing managerial leadership like organizationalbehavior;
2) To develop students so that they make business decisions; including learning to apply quantitative approaches and to use computer programs and systems in bringing speed to business decision making;and
3) To enlighten students on what adds value to a process from a customer's perspective and what degrades the value of a product or a service which in turn helps the student take effectivedecisions.

Course Outline:

Unit 1: Operations Management in Service Sector: Service Specification, Service Delivery, List of Economic Services, Operations Management in Services, Difference Between Service Operation and Manufacturing Operations, Operations Concept, Managing Service Operations, Planning/Forecasting to Meet Service Demand, Service Quality.

Unit 2: Retail Store Operations: Retails, Store Operations, Types of Retail Outlets, Retail Store Layouts, Store Floor Plan, Responsibilities of the StoreManager.

Unit 3: Retail Support Services: Hurdles to Retail Store Operation, Retail Pricing, Retail Merchandising, Cross Merchandising, Visual Merchandising, Collaborative Planning, Forecasting and Replenishment, Inventory Management in Retail, Bar-coding and RFID, Vendor Managed Inventory in Retail.

Unit 4: Banking Operations: Importance of Banking, Types of Banks, Channels, Types of Bank Accounts, Card Facilities in Banks, Opening of Accounts, Customer Identification Procedure, Introduction of Customer Accounts, Maintenance of Accounts & Operational Procedures, Managing Cheques in the Banks, Cash Transactions, Miscellaneous Banking Operations.

Unit 5: Aviation Operations Management: Aviation Development, Civil Aviation, General aviation, Military Aviation, Cargo Management, Aerodrome Management, Air Traffic Control, Air Traffic Flow Management, Passenger Management in Air Transport, Aircraft Boarding Operations, Aviation Vehicle Management, Airline Crew Operations.

Unit 6: Shipping Operations: Bulk Cargo Shipping, Break Bulk Shipping, Containerization, Mid-stream Operation, Ship-To-Ship (STS) Transfer, Underway replenishment, Stevedore, Transshipment, Lashing & Choking, Freight Forwarding, Sea Port Operations, Pilotage.

Unit 7: Railway Operations: Railway Station, Railway Signaling, Rail Systems, Trains, Types of Railway Operations, Railway Track, Railway Crew

Unit 8: Logistics Operation: Scope of Logistics, Business Logistics, Logistics Goals, Warehouse Operations, Warehouse Location, Cool Warehouses and Cold Storage, Warehouse Management System, Inventory Management, Third-party Logistics and Fourth Party Logistics, Reverse Logistics, Total Logistics Costs, Distribution Operations.

Unit 9: IT Operations: IT as a Service Operation, IT Operations Management Tasks, Software Development, Software Design, Enterprise Resource Planning, Role of Software Developer, Role of Software Engineer, Role of ComputerProgrammer.

Unit 10: Outsourcing Operations: Scope of Outsourcing, Business Process Outsourcing, BPO Activities, Service Management in BPO, Off-Shoring, KPO, Legal Outsourcing.

Unit 11: Healthcare Operations: Health Care System, Hospital Operations, Hospital Building Attributes, Materials Management in Hospitals, Information Management in Healthcare Operations, Operational Focus in Healthcare, ERP Implementation in Healthcare Industry.

Unit 12: Insurance Operations: Concept of Insurance, Legal requirements of Insurance, Indemnification,

Underwriting and Investment, Insurance Claims, Types of Insurance, Insurance Companies Operation, Reinsurance & Captive Companies, Miscellaneous Insurance Operations, Insurance Productivity.

Unit 13: Hospitality Service Operations: Restaurant Operations, Lodging Operations, Amusement Parks and Theme Parks, Catering Operations, Club Operations, Event Management Operations.

Unit 14: Miscellaneous Service Operations: Entertainment Operations, Filmmaking, Broadcasting Operations, Television Operations, Radio Operations, Trade Fair Operations, Travel and Tourism Operations, Exim Operations, Postal Operations, Courier Operations.

Course Outcome:

On successful completion of the course the learner will be able to:

CO#	Cognitive Abilities	Outcomes
CO305.1	**Understand**	Exhibit leadership skill.
CO305.2	**Analyse**	Add values by taking the correct decision.
CO305.3	**Apply**	Impart the decision-making approach by learning service industry.
CO305.4	**Apply**	Implement various skills for smooth running of an organization.

Suggested Reading:

1. The Filmmaker's Handbook: A Comprehensive Guide for the Digital Age Publisher: Plume Books, Publication date: 07/01/2007, Authors: Edward Pincus, StevenAscher
2. Independent Feature Film Production: A Complete Guide from Concept Through Distribution. Publisher: St. Martin's Griffin Publication date: 05/15/1998 Return Policy, Author: GregoryGoodell
3. Postal operations manual, United States Postal Service, United States Postal Service; for sale by the Supt. of Docs., U.S. Govt. Print. Off., 1998 - PoliticalScience

Semester	3	**Course Credits**	**4**	**Specialization**	Operations Management
Course Code	OMBO-306			**Type**	Specialization Course
Course Title	Statistics and Quantitative Techniques (SQT)				

Course Description:

Resources are always critical in any organization. They are unavailable in unlimited manner and there are always constraints. Operation research is helpful in the situation of such constraint of resources. Managers have to manage limited available resources in such a way that neither production nor other activities get disturbed in the business. Facility design is a fascinating area for OR. The excitement of operation research lays in the application of quantitative techniques to real-world problems.

Course Objectives:

1) To impart knowledge in concepts and tools of OR and QT;and
2) To help students apply these tools in managerial decisionmaking.

Course Outline:

Unit 1: Arranging Data to Convey Meaning: Presenting Data in Tables & Charts: Application Areas for Statistics, Statistical Methods, Understand Data, Organize and Classify Data, Graphical Representation of Data, Good & Bad Data Presentation.

Unit 2: Measures of Central Tendency – Mean, Median, Mode: Numerical Data Properties, Frequency and Frequency Table, Summary Measures– Central Tendency.

Unit 3: Measures of Dispersion: Summary Measures– Variation.

Unit 4: Correlation Analysis: Correlation Analysis– Scatter Plots, Some Misconceptions About Correlation, Correlation Terminologies.

Unit 5: Simple and Multiple Regressions: Regression Analysis, Simple Regression, Multiple Regressions.

Unit 6: Association of Attributes: Notations, Classes and Class Frequencies, Relationship Between the Class Frequencies, Consistency of the Data, Independence of Attributes, Association of Attributes, Yules' Co-efficient ofAssociation.

Unit 7: Probability & Probability Distribution: Notation and Terminology from Set Theory, Addition Theory of Probability, Conditional Probability, Multiplication Theory of Probability, Applications of

Bayes' Theorem, Binomial Distribution, Poisson Distribution, Normal Distribution.

Unit 8: Linear Programming – Formulation & Graphical Solutions to LPP: Variables, Constraints, Objective, Phases of an Operations Research Project, Linear Programming– Formulation Graphical Solutions to LPP.

Unit 9: Transportation: Mathematical Formulation of Transportation Problem, North-West Corner Rule, Lowest Cost Entry Method, Vogel's Approximation Method, Test for Optimization.

Unit 10: Assignment Problems: Mathematical Statement of Assignment Problem, Solution Method for Assignment Problem, Travelling Salesman Problem.

Unit 11: Queuing Theory – Single Server & Multi Server: Analysing Queuing Process, Constituents of Queuing System, Service Facility, Queuing Discipline, Kendall Notations, Single Server Models, Multi-Server Models

Unit 12: Markov Chain: Monte Carle Simulation: Simulation Procedure, Application of Simulation.

Unit 13: Games Theory: Zero Sum Games, Fundamental Principles of Game Theory, Reducing by Dominance, Saddle Point, Strictly Determined Game, Mixing Strategies, Flow of Solution, Assumptions for Games Theory.

Unit 14: Decision Theory - Criteria for Decision Making: Decision Tables, Decision Making Process, Decision Criteria for Certainty, Decision Criteria for Uncertainty [5 Criteria], Decision Criteria for Risk.

Course Outcome:

On successful completion of the course the learner will be able to:

CO#	Cognitive Abilities	Outcomes
CO306.1	**Remember**	Learn the basic concepts of operational research.
CO306.2	**Apply**	Easily apply the tools in managerial decision making.
CO306.3	**Analyse**	Grab the opportunities in operation as a career.
CO306.4	**Creating**	Easily do operational research for better growth.

Suggested Reading:

1. Taylor III. Bernard W., Introduction to Management Science, Dorling Kindersley (India) Pvt. Ltd., licenses of Pearson Education in South Asia, 9th Edition,2008.
2. Vohra N. D., Quantitative Techniques in Management, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 3rd Edition,2007.

Semester-IV Operations Management (OM) Specialization

Semester	4	**Course Credits**	**4**	**Specialization**	Operations Management
Course Code	OMBO-401			**Type**	Specialization Course
Course Title	Work System Design (WSD)				

Course Description:

Work System Design deals with the systematic examination of the methods of doing work with an aim of finding the means of effective and efficient use of resources and setting up of a standard of performance for the work being carried out. The systematic examination of work involves what is done and how it is done. As well as what is the standard time to do the work. This is required to have an in-depth analysis of all the elements, factors, resources, and relationships affecting the efficiency and effectiveness of the work being studied. The course also aims at scientifically establishing the time required for a qualified worker to carry out a work element at a defined rate of working. Ergonomic aspects of work system design are also included in the course contents. The scope of this course is not only limited to the manufacturing applications, but it is also relevant for service sectorindustry.

Course Objectives:

1) The student should be able to document information system requirement and propose an information system design for a realorganization.
2) The student should be able to understand and implement the proper structure of work system what they learn;and
3) Learn the problem-solving techniques and operations analysis which will be useful to create a proper and appropriate work environment.

Course Outline:

Unit 1: Introduction to Work System Design: Definition of Work System, Special Cases, Work System Framework, Work System Life Cycle Model, Work System Method, A Problem- Solving Approach, Work Design & Productivity, Productivity Models, Models of National Economy, The WorkplaceDesign.

Unit 2: Problem-Solving Tools: Exploratory Tools, Recording and Analysis Tools, Quantitative Tools**,** Worker MachineRelationship.

Unit 3: Operations Analysis: Operations Purpose, Part/Product Design, Specification and Tolerance, Manufacturing and Process Sequencing, Setup and Tools, Material Handling**,** Work Design.

Unit 4: Design of Manual Work, Workplace, Equipment and Tools: Anthropometry & Design, Principles of Work Design, Principles of Workplace Design, Principles of Machine and Equipment Design, Principles of Tool Design, Cumulative Trauma Disorders (CTD.)

Unit 5: Design of the Work Environment: Impact of Temperature, Role of Ventilation, Noise and Its Impact, Lighting, OHSAS 18001:2004.

Unit 6: Design of Cognitive Work: Information Theory, Human Information Processing Model, Perception and Signal Detection Theory, Coding of Information: General Design Principles, Display of Visual Information, Display of Auditory Information, Environmental Factors, Dissociating the Signal from Noise, Human Computer Interaction: Hardware Considerations, Pointing Devices**,** Human Computer Interaction: SoftwareConsiderations.

Unit 7: Anthropometry & Work Design: Using design Limits, Avoiding Pitfalls in Applying Anthropometric Data, Solving a Complex Sequence of Design problems, Need for Indian Anthropometry, Guidelines for Design Use, Percentile Selection for Design Use, Use of Average, Concept of Male-Female Combined Data for Design Use, PracticalApplications.

Unit 8: Muscular System and Work: Characteristics of Health Problems, Basic Risk Factors for the Development of Musculoskeletal Disorders, Factors Contributing to theDevelopment to Musculoskeletal Disorders, Factors to be Considered in Prevention, Guidance on Main Risk Factors, Basic Rules for Preventive Actions inPractice.

Unit 9: Thermal Environment: Physiological Measurements, Thermal Balance, Thermal Indices**,** Heating Systems.

Unit10: Standard Data and Formulas: Standard Time Data Development, Tabular Data, Using Nomograms and Plots, Formula Construction from Empirical Data, Plot Data and Compute Variable Expressions, Analytical Formulas**,** Standard Data Usage.

Unit11: Occupational Noise Environment: The Risk Factor and Its Health Outcome, Health Outcomes to Include in the burden of Disease Assessment, Exposure Indicator, Estimating Relative Risks for Health Outcomes, By Exposure Level, Estimating the Attributable Fraction and the Disease Burden, Uncertainty in Exposure Estimates¸ Policy Implications.

Unit 12: Occupational Vibrations: Vibration**,** whole-body, Vibration Measurement, Vibration Limits,