School of Architecture, Science and Technology
Yashwantrao Chavan Maharashtra Open University

Syllabus V47: M.Sc. Industrial Engineering

2012

AST, YCMOU, NASHIK – 422 222, MS, INDIA

CONTENTS

Basic Information

1. **Mode of Education**: Full time residential face-to-face mode of education enhanced with ELearning support.
2. **Minimum Programme Duration**: 2 years after Graduation
3. **Required Study Efforts**: 720 Hours in **each** semester
4. **Medium of Instruction**: English
5. **Attendance**: Minimum 80% attendance for all courses.
6. **Equivalence Status**:
    a. UGC recognized and approved
    b. DEC recognized and approved
    c. Recognized by Government of Maharashtra for MPSC jobs

Programme Calendar

SN	Activity Description	Odd semesters like 01, 03, 05 and 07 01 Aug - 31 Jan	Even semesters like 02, 04, 06 and 08 01 Feb – 31 Jul
Direct Admission, Course Exemption, Credit Transfer (DACECT) **DACECT Form**: In Prospectus and on website {Must apply 10 days **before first fresh admission**} **DACECT Decision**: must be attached **along with** the admission form for first fresh admission.			
01	DACECT Form Submission at University	05 Jun – 25 Jul	Not Offered
02	DACECT Approval by University	Within 5 working days from the day of receipt	Not Offered
Annual Admission*: University Fee (including EF for the first compulsory attempt) must be paid **along with** the admission form, at a time for 2 semesters (an odd and even semester) in an academic year.			
03	Annual Further Admission	05 Jun – 05 Jul	05 Jun – 05 Jul
04	Annual Fresh Admission	05 Jun – 05 Aug	05 Jun – 05 Aug
Teaching – Learning (Face-To-Face counseling at each study center and Self-Study)			
05	Teaching - Learning	01 Aug – 13 Nov	01 Feb – 16 May
06	Teaching–Learning Backlog Clearing or Preparation Leave	14 Nov – 04 Dec	17 May – 04 Jun
Exam Form (EF) Submission {**Not required for the first compulsory attempt**. Required **only for repeater students** for backlog courses and performance improvement} EF available on Website for only repeater students.			
07	EE Form Submission by students at SC	On or Before 30-Sep	On or Before 31-Mar
08	EE Form Submission by SCs at University	On or Before 05-Oct	On or Before 05-Apr
Continuous Assessment (CA) Submission: **Maximum single attempt**. **Zero marks given for 'no attempt' or 'non-receipt of Final "Assessment Report" of CA at University before specified date'**.			
09	CA Availability at each study center	01 Aug – 30 Nov	01 Feb – 30 May
10	CA Submission by Students at SC	01 - 30 Nov	01 - 30 May
11	Provisional CA Report by SCs (On SCs Notice Board)	On or before 31-Dec	On or before 30-Jun
12	Final CA Report Submission by SCs at University	On or before 31-Jan	On or before 31-Jul
End Examination (EE)*: **Maximum 5 attempts during consecutive 5 semesters**. **Permanent drop out from the programme, if successful completion not possible, within these maximum 5 attempts**.			
13	EE for Theory Courses	05 Dec – 14 Dec	05 Jun – 14 Jun

14	EE for Practical, STW, SV or PW Courses	Immediately **after** the last day of end exam for theory courses, but **positively before** 05-Jan	Immediately **after** the last day of end exam for theory courses, but **positively before** 05-Jul
15	End Exam Result Declaration	On or before 20 Feb	On or before 20 Aug
Semester End Vacation			
16	Semester End Vacation	08 Jan – 31 Jan	08 Jul – 31 Jul

ELIGIBILITY AND FEES

Admission Eligibility	Certification Eligibility	Fees and Deposit / Semester
Grad. IIIE exam or B.E. / B.Tech. or eq Pass with minimum 50%	Min 50% or better marks in total 26 courses (subjects) of total 80 credit points at Semesters 01-04. Aggregate performance and Class in the programme shall be reported on the basis of **only** semesters 03-04.	Desc: Amount UF: 4,800 SCF: 11,200 **Total: 16,000** **AAFA: 9,600**

Semesters and Courses

SN	Code	Name	CA	EE	TM	Type	CPs
Semester 01: 20 CPs							
01	S17011	Advanced Production Planning & Control	20	80	100	T	4
02	S17012	Project Management	20	80	100	T	4
03	S17013	Marketing Management	20	80	100	T	4
04	S17014	Research Methodology	20	80	100	T	4
05	S17015	Industrial Engineering Lab	20	80	100	P	4
Semester 02: 20 CPs							
09	S17021	Ergonomics	20	80	100	T	4
10	S17022	Reliability Engineering	20	80	100	T	4
11	S17023	World Class Manufacturing	20	80	100	T	4
12	S17024	Software Engineering	20	80	100	T	4
13	S17025	Software Lab	20	80	100	P	4
Semester 03: 20 CPs							
17	S17031	Systems Analysis and Simulation	20	80	100	T	4
18	S17032	Enterprise Resource Planning	20	80	100	T	4
19	S17033	Service Marketing	20	80	100	T	4
20	S17034	Security Analysis and Portfolio Management	20	80	100	T	4
21	S17035	Project Work Stage I	20	80	100	PW	4
Semester 04: 20 CPs							
25	S17041	Organizational Behavior	20	80	100	T	4
26	S17042	Project Work Stage II	20	80	100	PW	16

Evaluation Pattern

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment</th><th>End Examination</th></tr>
<tr><td>1</td><td>Theory (T)</td><td>1. Student is required to answer 1 of 1 SAQ, each of 5 marks, on each CP
2. Single attempt only
3. Marks: 5 Marks for each CP
4. Duration: Specified 1 Month</td><td>1. Student is required to answer 1 of 1 SAQ, each of 5 marks, on each CP
2. Student is required to answer 1 of 2 LAQs, each of 15 marks, on each CP
3. Maximum 5 Attempts only
4. Marks: 20 Marks for each CP
5. Duration: 45 minutes for each CP</td></tr>
<tr><td></td><td></td><td colspan="2">
<table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination</th><th>Marks</th></tr>
<tr><td>1</td><td>Question Type</td><td>1 Short Answer Question (SAQ) /CP, and
1 out of 2 Long Answer Question (LAQ)/CP,</td><td>5 Marks /CP,
15 Marks/CP</td></tr>
<tr><td>2</td><td>Total</td><td>Section A : CP 1 - 1 SAQs and 1 out of 2 LAQs and
CP 2 - 1 SAQs and 1 out of 2 LAQs
Section B : CP 3 - 1 SAQs and 1 out of 2 LAQs and
CP 4 - 1 SAQs and 1 out of 2 LAQs</td><td>80 Marks</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Practical (P)</td><td>1. Student is required to submit “Activity Report” for each CP in the prescribed format.
2. Single Attempt only
3. Marks: 5 Marks for each CP
4. Duration: Specified 1 Month
5. CAT: Continuous Assessment Time is 1 hr for each C.P.</td><td>1. External and internal examiners shall assess each student based on:
a. Conduct of One Randomly Selected Practical Activity – 5 Marks
b. Viva-Voice - 5 Marks
c. Journal (Workbook) - 5 Marks and
d. Report of Practical Activity - 5 Marks
2. Maximum 5 Attempts only
3. Marks: 20 Marks for each CP
4. Duration: 240 minutes</td></tr>
<tr><td></td><td></td><td colspan="2">
<table>
<tr><th rowspan="2">SN</th><th colspan="4">Evaluation of Practical End Examination</th></tr>
<tr><th>Description</th><th>Internal Examiner</th><th>External Examiner</th><th>Total Marks</th></tr>
<tr><td></td><td colspan="2">Duration of End Exam: 240 minutes (4 hrs)</td><td colspan="2">Batch size: ≈15 students</td></tr>
<tr><td>1</td><td>Actual Conduct of 1 randomly selected practical activity</td><td>8 Marks</td><td>13 Marks</td><td>21</td></tr>
<tr><td>2</td><td>Viva-Voice</td><td>7 Marks</td><td>12 Marks</td><td>19</td></tr>
<tr><td>3</td><td>Workbook (Journal)</td><td>8 Marks</td><td>13 Marks</td><td>21</td></tr>
<tr><td>4</td><td>Reprt of Practical Activity with Diagram, synoptic Answers, Graph/Observation and Conclusion</td><td>7 Marks</td><td>12 Marks</td><td>19</td></tr>
<tr><td colspan="2">Total</td><td>30 Marks</td><td>50 marks</td><td>80 Marks</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Project Work (PW)</td><td>1. Student is required to submit “Activity Report” for each CP in the prescribed format.
2. Single Attempt only
3. Marks: 5 Marks for each CP
4. Duration: Specified 1 Month
5. CAT: Continuous Assessment Time is 1 hr for each C.P.</td><td>1. External and internal examiners shall assess each student based on:
a. Project Proposal and Review of Literature - 5 Marks
b. Project Results and Report - 5 Marks
c. Presentation - 5 Marks and
d. Viva-Voce - 5 Marks
2. Maximum 5 Attempts only
3. Marks: 20 Marks for each CP
4. Duration: 240 minutes</td></tr>
</table>

SN	Type of Course	Continuous Assessment		End Examination		
		SN	Description	Internal Examiner	External Examiner	Total Marks
		1	Project Proposal and Review of Literature	30 Marks	50 Marks	80
		2	Project Result and Report	30 Marks	50 Marks	80
		3	Presentation	30 Marks	50 Marks	80
		4	Viva/Oral	30 Marks	50 Marks	80
			Total	**120 Marks**	**200 marks**	**320 Marks**

Actual CA and EE marks shall be used in computation of "Total Marks (TM)". "Grace Factor" and "Total Marks (TM)" shall be used in computation of Percentile marks. Only percentile marks shall be reported for each course in the mark-statement. For successful completion, minimum 50% marks shall be essential for each course. Only best of the past performance shall be reported.

Semester 01

S17011- Advanced production planning and control

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17011	Advanced production planning and control	4	44	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

1. Continuous Assessment (CA): 20 Marks
2. End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Understood the planning process required in production

4. Units

UN	Name of Unit	CST	Questions
1	Production Planning	CP 01 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
2	Capacity and Process Planning		
3	Inventory Control	CP 02 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
4	MRP	CP 03 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
5	Advanced Manufacturing Technologies	CP 04 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.

5. Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
01	**Production Planning:** Introduction, Production Planning and Production Control, Functions and Objectives of production planning control, Production procedure, Information Requirement of PPC, manufacturing Methods and PPC, Product Life Cycle, Product design, Demand Forecasting- Long Term, short term forecasting, Time series analysis, least square method, exponential smoothing method, Moving Average forecasting.	
02	**Capacity and Process Planning:** Introduction, Measurement and measures of capacity, factors influencing effective capacity, factors favouring over capacity and under capacity, aggregate planning, liner programming approach to aggregate planning, Master production Schedule, Process Planning –Machine, Manpower Planning, line balancing. Make or Buy Decisions- Factors influencing make or buy decisions, Functional aspects of make or buy decision.	CP 01
03	**Inventory Control:** Introduction, Types of inventories, reasons for keeping inventories, inventory control, benefits of inventory control, cost associated with inventory, inventory cost relationships, safety stock, inventory models, deterministic and stochastic models, inventory control system, selective control of inventory.	CP 02
04	**MRP:** Introduction, Objectives of MRP, MRP-I System, MRP-II system, Implementation and evaluation of MRP, Management information from MRP, Lot sizing consideration.	CP 03
05	**Advanced Manufacturing Technologies:** Introduction, growth of technology, JIT, KANBAN, Lean manufacturing, agile manufacturing, CAD, CAM, and Computer aided process planning, Computer integrated manufacturing.	CP 04

6. Learning Resource Details

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17011– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17011–TB1			
S17011–TB2			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17011–RB1	Manufacturing Planning and Control Systems Vollmann Thomas E, Bery William L, Why bark D Clay, s	2002	Galgotia Publication, New Delhi
S17011–RB2	Modern Production/operations Management Buffa	1999	Wiley Eastern, New York
S17011–RB3	Production and Operations Management, Muhlemann Alan, Oakland John and Lockyer Keith	2001	Macmillan India Publications Ltd.
S17011–RB4	Production and Operation Management Panneer Selvan R	2002	Prentice Hall India, New Delhi
	Production and Operations Management, Aswathappa K and Bhat K Shridhara,	2002	Himalaya Publishing House, Mumbai
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17011-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17011-WL1			

S17012- Project Management

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17012	Project Management	4	44	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

4.Continuous Assessment (CA): 20 Marks

7. End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Develop project management technique

4. Units

UN	Name of Unit	CST	Questions
1	Project Management Concepts	CP 01 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
2	Project Organizational structures and Behaviors		
3	Project Planning	CP 02 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
4	Cost Estimating and Budgeting		
5	Resource Allocation		
6	Project Performance Measurement and Control	CP 03 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
7	Contracting For Project Manages		
8	Risk Management Process	CP 04 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
9	Introduction to Project Management Software and Case Studies		

5. Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
1	**Project Management Concepts** : Characteristics of a project Need for project management. Roles of project managers.	

2	**Project Organizational structures and Behaviors :** Organisation for projects, Roles and responsibilities of project team members and team leader, Different types of teams, Identify leadership styles of project managers, Tedmiques used to manage groups and individuals, Identify sources of diversity, either corpora~ or ethnic, that impact project team effectiveness.	**CP 01**
3	**Project Planning:** Statement of work (SOW) and overall project goals, Work breakdown structure (WBS), Preparation of Task-Flow network, CPM-PERT, Gantt chart. Schedule the completion of all work elements, Planning project communication, Quality Planning.	**CP 02**
4	**Cost Estimating and Budgeting**: Preparing cost estimates, budgets and expenditures, Effort and Tune estimation, developing cost summaries for tracking project expenditures, Developing cost forecasts to proactively control future planned expenditures.	
5	**Resource Allocation**: Identifying resource requirement, Scheduling resources, Analyze optimal labour utilization for cost effectiveness and schedule efficiency.	
6	**Project Performance Measurement and Control** : Concept of earned value performance measU11!mel\t, Use of Project Management Information Systems (PMIS) to monitor, evaluate, and control planned cost and schedule performance, Conducting periodic project performance evaluation audits. Unit VB: Project Evaluation and Termination - Analyzing project performances versus cost and schedule constraints, Identify causes associated with project success and failure. Ways in which a project can be terminated upon completion.	**CP 03**
7	**Contracting For Project Manages** : Define contract administration and its role in project management, .Project Procurement cycle, Contract Administration policies and procedures, Select contract types for various situations. Contract Proposal Development, Contract Terms & Conditions, Contract Negotiation.	
8	**Risk Management Process** : Analyze the risk management process cycle within a company, Defend the role of risk management in overall project management, Identify risk management activities throughout the project life cycle, Identify the risk management process.	**CP 04**
9	**Introduction to Project Management Software and Case Studies** : Introduction to MS- Project software, Study of Recent Case-Studies in project management.	

6. Learning Resource Details

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17012– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17012–TB1			
S17012–TB2			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17012–RB1	Project Management, A Managerial Approach. Meredith and Mantel. Course Text.	2003	John WIley and Sons, Fifth Edition
S17012–RB2	The New Project Management, J. Davidson Frame,	1994	Jasser-Bass
S17012–RB3	Project Management, Harold Kerzner, Van Nostrand Reinhold	1979	
S17012–RB4	Successful Project Management, Milton D. Rosenau. Lifelong Learning.	1981	
S17012–RB5	The Implementation of Project Management, Project ~ Institute	1982	Addison-Wes1ey
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17012-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17012-WL1			

S17013- Marketing Management

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17013	Marketing Management	4	44	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

4. Continuous Assessment (CA): 20 Marks
5. End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Understood various market strategies

4. Units

UN	Name of Unit	CST	Questions
1	Marketing function and its role	CP 01 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
2	Market research		
3	Market segmentation	CP 02 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
4	Pricing of products and services	CP 03 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
5	Promotion	CP 04 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.

5. Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
1	**Marketing function and its role** – marketing concepts – marketing environment – marketing strategy – types of marketing organizations.	CP 01
2	**Market research** – functions of market research department – demand forecasting – different methods and their applications – conducting market research – consumer behavior – the Indian consumer.	

3	**Market segmentation** – market targeting – market positioning – developing new productions – product life cycle – product portfolio management – brand management and brand equity.	**CP 02**
4	**Pricing of products and services** – pricing methods – product distribution logisitics – wholesaling and retailing – communication management in marketing – marketing ethics.	**CP 03**
5	**Promotion** – promotion methods – promotion mix – personal selling and direct selling – CRM – International marketing, rural marketing and service marketing.	**CP 04**

6. Learning Resource Details

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17013– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17013–TB1			
S17013–TB2			
S17013–TB3			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17013–RB1	Marketing Management , Kotler, Keller, Koshy and Jha		Pearson
S17013–RB2	Marketing Management , Ramaswamy and Namakumari		Mac Millan
S17013–RB3	Marketing Management , Arunkumar and Meenakshi		Vikas Publishers
S17013–RB4	Marketing Management , Palmer		Oxford Publishers
S17013–RB5	Marketing Management , Rajan Saxena		TMH
S17013–RB6	Marketing Management , Lal, Quelch, Kasturi Rangan		TMH
S17013–RB7	Marketing Management , DebRaj Dutta		Vrinda Publishers
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17013-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17013-WL1			

S17014- Research Methodology

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17014	Research Methodology	4	44	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

4. Continuous Assessment (CA): 20 Marks
5. End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Apply statistical technique for data analysis

4. Units

UN	Name of Unit	CST	Questions
1	Introduction	CP 01 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
2	Sampling Design, Measurement & scaling techniques		
3	Methods of data collection - Primary data	CP 02 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
4	Analysis of data	CP 03 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
5	Interpretation of data	CP 04 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.

5. Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
1	**Introduction**: Meaning, objectives and types of research, research problem, research process, meaning, features, types, basic principles of Research Design.	CP 01

2	**Sampling Design, Measurement & scaling techniques** : Steps in sample Design, Characteristics of a good sample Design, Probability & Non Probability sampling, Errors in measurement, Test of sound measurement, Scaling and scale construction technique.	
3	**Methods of data collection - Primary data** : questionnaire and interviews; Collection of secondary data; Use of computer and Information technology in data collection, Survey Errors, Data coding; Editing and Tabulation.	**CP 02**
4	**Analysis of data** : Hypothesis testing, statistics in testing of hypothesis, Chi S-square, Analysis of Variance; multivariable analysis.	**CP 03**
5	**Interpretation of data** : Report writing, Layout of a research report, computer application in preparation and presentation of research reports.	**CP 04**

6.LEARNING RESOURCE DETAILS

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17014– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17014–TB1			
S17014–TB2			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17014–RB1	Business Research Methods, Zikmund		Thomson Learning Books
S17014–RB2	Marketing Research, G C Beri third edition		McGraw Hill
S17014–RB3	Research Methods in Behaviourial Science Dwivedi		Macmillan
S17014–RB4	Management Research, Bennet, Roger	1993	ILO
S17014–RB5	Exploring Research, Salkind, Neil J	1997	Prentice – Hall
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17014-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17014-WL1			

S17015- Industrial Engineering Lab

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V61	S17015	Industrial Engineering Lab	4	64	120	100	P

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

4. Continuous Assessment (CA): 20 Marks
5. End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Prepare operation process and control chart • Understood different process related to industrial engineering

4. Detail Activities

UN	Detail Syllabus of the Unit
1	Preparation of operation process chart
2	Preparation two- handed process chart
3	Preparation of multiple activity chart
4	Demonstration of work sampling
5	Experiment to demonstrate methods improvement
6	Experiment to draw learning curve
7	Demonstration of central limit theorem
8	Drawing control chart for variables
9	Drawing control charts for demerits
10	Drawing O-C curve
11	Experiment to demonstrate finished product inspection
12	Experiment to demonstrate control chart – for fraction defectives

5. LEARNING RESOURCE DETAILS

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17015– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17015–TB1			
S17015–TB2			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17015–RB1			
S17015–RB2			
S17015–RB3			
S17015–RB4			
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17015-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17015-WL1			

Semester 02

S17021-Ergonomics

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17021	Ergonomics	4	44	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

4. Continuous Assessment (CA): 20 Marks
5. End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Explain characteristic features of man-machine system and its components • Design controls and equipment using anthropometric data, etc

4. Units

UN	Name of Unit	CST	Questions
1	Man - Human Factors in a Production System	CP 01 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
2	Design of work place and work components	CP 02 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
3	Design of Controls & Displays		
4	Environmental Factors	CP 03 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
5	Physiological Functions	CP 04 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.

5.DETAIL SYLLABUS

UN	Detail Syllabus of the Unit	CP Block
1	**Man - Human Factors in a Production System:** Introduction, history of development, Characteristic features of man-machine system and its components, human performance and performance reliability; Human Sensory motor systems, stimulus dimensions, human information processing, noise and theory of signal detection (TSD)	CP 01
2	**Design of work place and work components:** Introduction, principals in application, design of work surfaces. Applied anthropometry types, use and seat design, Human body and anthropometric data	CP 02
3	**Design of Controls & Displays:** Introduction, design of controls and equipment using anthropometric data - Design of displays and controls - work place design - design of visual displays - product design, visual displays for static information, visual displays for dynamic information, auditory, tactual and olfactory displays and controls.	
4	**Environmental Factors:** Introduction, Illumination -design of lighting system - sound measurement - acoustics and noise reduction -effect of temperature, humidity and vibration on performance during working.	CP 03
5	**Physiological Functions:** Introduction, measure of physiological functions, introduction to structure of the body features of the human body, stress and strain, metabolism, workload and energy consumption ,biomechanics, types of movements of body members, strength and endurance, speed of movements, NIOSH lifting equation, lifting index, maximum acceptable weights and forces, distal upper extremities risk, Strain Index, RULA, REBA, and Office Ergonomics , measurement of energy expenditure - respiration, pulse rate and blood pressure during work Evaluation of physical work capacity.	CP 04

6. LEARNING RESOURCE DETAILS

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17021– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17021–TB1			
S17021–TB2			
S17021–TB3			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17021–RB1	Human Factors Engineering, M S Sanders and McCormick		TMH
S17021–RB2	Handbook of Human Factors and Ergonomics, G. Salvendy		John Wiley & Sons
S17021–RB3	Ergonomics – How to design for ease and efficiency , KHE Kroemer		Prentice Hall Englewood Cliffs.
S17021–RB4	Indian Adaptation–Introduction To Work-study		ILO, Geneva, Oxford & IBH Pub. Co. Pvt. Ltd.
S17021–RB5	Ergonomics at Work by Murrell		
S17021–RB6s	Ergonomics & Value Engg.		T & P
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17021-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17021-WL1			

S17022- Reliability Engineering

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17022	Reliability Engineering	4	44	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

4. Continuous Assessment (CA): 20 Marks
5. End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Understood basic concept of system reliability and improvement

1. Units

UN	Name of Unit	CST	Questions
1	Basic concept of Reliability	CP 01 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
2	Failure –Data Analysis		
3	System Reliability	CP 02 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
4	Reliability Improvement	CP 03 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
5	Maintainability & Availability	CP 04 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.

2. Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
1	**Basic concept of Reliability:** Introduction, Fundamentals of Probability, Probability & Reliability, Definition of Reliability & Reliability functions.	

2	**Failure –Data Analysis:** Introduction, Failure data, Bath tub curve, Mean time to failure (MTTF), Mean time between failure (MTBF), Failure mode effect & criticality analysis (FMECA). Hazard Models-Weibull model, Important distributions, Theorems concerning expectation & variance.	**CP 01**
3	**System Reliability:** Introduction, System with component in series, System with parallel components, System with mixed configurations & Methods of solving complex systems, k-out-of-m systems.	**CP 02**
4	**Reliability Improvement:** Introduction, Redundancy, Element redundancy, Unit redundancy, Standby redundancy & Reliability-Cost-Trade-off. Reliability allocation-Introduction, Reliability allocation for a series system.	**CP 03**
5	**Maintainability & Availability:** Introduction, Definitions- Maintainability & Availability, System downtime, Reliability & Maintainability Trade-Off, Instantaneous Repair Rate, Mean time to repair (MTTR), Reliability & Availability functions.	**CP 04**

3. LEARNING RESOURCE DETAILS

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17022– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17022–TB1			
S17022–TB2			
S17022–TB3			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17022–RB1	Reliability Engineering, L. S. Srinath	3rd Edition	East-West Press Pvt. Ltd. (EWP)
S17022–RB2	Introduction to Reliability in Design, Charles O. Smith		McGraw- Hill Kogakusha, Ltd
S17022–RB3	Reliability Engineering, E. Balagurusamy,		Tata McGraw-Hill Publishing Co. Ltd.
S17022–RB4	Reliability of Engineering Systems, I. Ryabinin		Mir Publication, Moscow
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17022-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17022-WL1			

S17023- World Class Manufacturing

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17023	World Class Manufacturing	4	44	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

4. Continuous Assessment (CA): 20 Marks
5. End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Understood strategies for manufacturing and automated systems

4. Units

UN	Name of Unit	CST	Questions
1	Economic liberalization and its impact	CP 01 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
2	JIT – total quality strategies for manufacturing success	CP 02 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
3	Technological innovation in manufacturing		
4	Automated factories	CP 03 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
5	Automated systems	CP 04 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.

5. Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
1	**Economic liberalization and its impact**: - necessity of world class production, challenges to Indian manufacturers, Product development process, technology, suppliers, process mapping, knowledge management.	CP 01

2	**JIT – total quality strategies for manufacturing success**: TQM, Six Sigma quality, WCM model , Technological innovation, Innovative designs.	
3	**Technological innovation in manufacturing** – computer integrated manufacturing JIT manufacturing systems : flexible manufacturing systems, cellular manufacturing, Manufacturers Resources Planning (MRP II).	**CP 02**
4	**Automated factories:** Automated factories, intelligent manufacturing systems, agile manufacturing, quick response manufacturing, rapid prototyping, concurrent engineering, and Tomorrow's factories.	**CP 03**
5	**Automated systems:** Factory of the future automated systems, human factors in automated systems, optimized production technology, simulation of production systems, Modeling, optimizing, simulation of manufacturing systems.	**CP 04**

6. LEARNING RESOURCE DETAILS

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17023– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17023–TB1			
S17023–TB2			
S17023–TB3			
S17023–TB4			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17023–RB1	World class New Product Development ,Dan Dimanescu, Kemp Dwenger		American Management Association.
S17023–RB2	M R P , George W Possel, Orliky – Mcgraw		Hill International
S17023–RB3	World Class Manufacturing Strategic Perspective , B.S.Sahay, KBC Saxena, Ashish Kumar		Mac Milan
S17023–RB4	Making Common Sense Common Practice – Models for manufacturing excellence; Ron Moore		Butter worth Heinmann)
S17023–RB4	The Toyota Way , Jeffrey K.Liker		Tata McGraw Hill
S17023–RB4	Operations Management for Competitive Advantage , Chase		
S17023–RB4	Making Common Sense Common Practice , Moore.		
S17023–RB4	Managing Technology & Innovation for Competitive Advantage, Narayanan		
S17023–RB4	Just In Time Manufacturing , M.G.Korgaonkar		
S17023–RB4	Machine That Changed The World, Womack		
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17023-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17023-WL1			

S17024- Software Engineering

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17024	Software Engineering	4	44	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

4. Continuous Assessment (CA): 20 Marks
5. End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Understood various concepts and requirements in software engineering and project management

4. Units

UN	Name of Unit	CST	Questions
1	System Concepts	CP 01 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
2	Software Requirements		
3	Software Design		
4	Software Construction	CP 02 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
5	Software Testing		
6	Software Maintenance		
7	Software Configuration Management (SCM)	CP 03 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
8	Software Quality		
9	Software Project Management	CP 04 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
10	New Trends		

5. Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
1	**System Concepts**: System Characteristics, Software Development Life Cycle (SDLC), Role of System Analyst, Characteristic of System Analyst, Introduction to Software development models.	CP 01
2	**Software Requirements** : Software Requirements Fundamentals, Requirements gathering, Requirements analysis, use of tools like DFD, Data Dictionary, Decision Trees, Structured English, Decision Tables Introduction to Feasibility Study and Cost/Benefit Analysis, Preparing Software Requirements Specification.	
3	**Software Design** : Software Design Fundamentals- understanding of the role and scope of software design, general software design concepts, the context of software design, the software design process; Key Issues in Software Design - concurrency, control and handling of events, distribution of components, error and exception handling and fault tolerance, interaction and presentation, Audit Control, Acceptance criteria, software design quality.	
4	**Software Construction**: Software construction fundamentals - minimizing complexity, anticipating change, and constructing for verification, coding standards.	CP 02
5	**Software Testing**: Software testing fundamentals-Testing-related terminology like Errors, Bugs, Defect, Debugging, Verification & Validation, Black-box & White-box testing etc, Objectives of the testing, Test techniques, Testing types, Defect Analysis and Defect reports, Overview of Testing Tool.	
6	**Software Maintenance**: Software maintenance fundamentals- definitions and terminology, the nature of maintenance, the need for maintenance, Maintenance processes and maintenance activities.	
7	**Software Configuration Management (SCM)**: Software configuration identification – identification of items to be controlled, establishing identification schemes for the items and their versions, and establishing the tools and techniques to be used, Management of changes during the software life cycle- requesting, evaluating, and approving software changes, implementing software changes.	CP 03
8	**Software Quality** : Software quality fundamentals- software engineering culture and ethics, the value and costs of quality, models and quality characteristics, and quality improvement, Software quality management processes- Software quality control, software quality assurance, Verification & Validation, reviews and audits, Introduction to CMM levels.	
9	**Software Project Management** - Managing People, Problems & Process, and Basic concepts of Measures, Metrics and Indicators, Project Scheduling & Tracking, Introduction to MS-Project.	CP 04
10	**New Trends** - Basic concepts of Software reusability, Software Reengineering, Reverse Engineering & Forward Engineering, CASE tools.	

6. Learning Resource Details

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17024– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17024–TB1			
S17024–TB1			
S17024–TB1			
S17024–TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17024–RB1	Software Engineering - A Practitioner's Approach, Roget Pressman		
S17024–RB2	System Analysis and Design , Elias Awad		
S17024–RB3	Software Engineering International Computer Science Series Ian Sommerville	7th Edition	
S17024–RB4			
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17024-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17024-WL1			

S17025- Software Laboratory

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17025	Software Laboratory	4	64	120	100	P

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

4. Continuous Assessment (CA): 20 Marks
5. End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Perform software operation with different simulation, project management, statistical analysis packages

4. Detail Activities

UN	Detail Syllabus of the Unit
1	Familiarization and hands – on -experience with: OR packages
2	Simulation packages
3	Project management software
4	Statistical analysis packages

5. Learning Resource Details

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17025– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17025–TB1			
S17025–TB2			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17025–RB1			
S17025–RB2			
S17025–RB3			
S17025–RB4			

04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17025-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17025-WL1			

SEMESTER 03

S17031- Systems Analysis and Simulations

1. PROGRAMME INFORMATION

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. COURSE INFORMATION

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17031	Systems Analysis And Simulations	4	44	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

4. Continuous Assessment (CA): 20 Marks
5. End Examination (EE): 80 Marks

3. PRESUMED KNOWLEDGE AND LEARNING OBJECTIVES

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Understood simulation and its methods

4. UNITS

UN	Name of Unit	CST	Questions
1	System concept in industrial and business undertakings	CP 01 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
2	Simulation – concepts	CP 02 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
3	Logic Flow Diagram	CP 03 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
4	Manufacturing and Maintenance System	CP 04 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.

5. Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
01	System - elements – entities – attributes – variables - system parameters and system terminology – system concept in industrial and business undertakings. System modeling – system analysis – modeling of manufacturing, service and social systems.	CP 01
02	Simulation – concepts – history, generation of random numbers – different methods – random variates.	CP 02
03	Logic flow diagram, input data, simulation methods – starting condition, typical condition analysis of results of discrete event simulation.	CP 03
04	Simulation of queueing system, manufacturing system, maintenance system etc. –simulation languages – simulation software – their features and application.	CP 04

6. Learning Resource Details

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17031– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17031–TB1			
S17031–TB1			
S17031–TB1			
S17031–TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17031–RB1	Discrete event system simulation , Jerry banks		Prentice Hall
S17031–RB2	Systems analysis and design, David J Theruf		CBS Publishers and Distributors
S17031–RB3	System simulation , Gordon Geoffrey		PHI
S17031–RB4	System analysis and design , Kendall & Kendall		PHI
	System analysis and design methods, Whitten & Bentley		
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17031-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17031-WL1			

S17032- Enterprise Resource Planning

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17032	Enterprise Resource Planning	4	44	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

4. Continuous Assessment (CA): 20 Marks
5. End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Understand concepts in ERP

4. Units

UN	Name of Unit	CST	Questions
1	Introduction to ERP – Concepts	CP 01 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
2	ERP Life Cycle		
3	ERP Architecture	CP 02 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
4	Product Selection		
5	Estimation Procedures	CP 03 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
6	ERP and BPR		
7	Project Management	CP 04 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
8	ERP Modules		

5. Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
1	**Introduction to ERP – Concepts:** Enterprise System, Resource Planning, Enterprise Potential, Total Enterprise Solution, ERP-II. History & Evolution of ERP, Benefits of ERP, Critical Success Factors for ERP.	CP 01

2	**ERP Life Cycle** : ERP Project, Stages of Project Life Cycle, System Requirements for ERP Implementation, Pre-Implementation, Implementation And Post-Implementation, ERP Product Life Cycle, Risks in ERP / SAP Implementation.	
3	**ERP Architecture**: Client Server, Distributed, Web Enabled.	
4	**Product Selection** : ERP Market, Market share of various Companies: Oracle E-Business Suite, SAP R/3, PeopleSoft, BaaN, JD Edwards One World and IFS, Vendor Comparison, Market Analysis, ERP Packages for SME.	**CP 02**
5	**Estimation Procedures**: System Evaluation, RFI, FRS, RFP, Evaluation Components, Build / Buy Decisions.	
6	**ERP and BPR**: Reengineering concept, BPR Steps, ERP / BPR Relationship.	**CP 03**
7	**Project Management**: Scope, Skill-sets, Teams, Leaders, Consultants, Vendors etc, Change Management in ERP, Need / Value / Strategy / Layers / Standards of System Integration.	**CP 04**
8	**ERP Modules**: Finance (FICO), Sales and Distribution (S&D), HRM, CRM and ABAP.	

6. Learning Resource Details

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17032– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17032–TB1			
S17032–TB1			
S17032–TB1			
S17032–TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17032–RB1	Textbook of Enterprise Resource Planning, Jaiswal / Vanapalli		McMillan
S17032–RB2	Concepts in Enterprise Resource Planning, Joseph Brady, Ellen Monk, and Bret Wagner		
S17032–RB3	From Underdogs to Tigers: The Rise and Growth of the Software Industry in Brazil, China, India, Ireland, and Israel , Ashish Arora and Alfonso Gambardella		
S17032–RB4	Reengineering The Corporation: Michael Hammer and James Chambay	1997	
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17032-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17032-WL1			

S17033- Service Marketing

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17033	Service Marketing	4	44	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

4. Continuous Assessment (CA): 20 Marks
5. End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Understand concepts in marketing of services • Handle properly relationship with the customer

4. Units

UN	Name of Unit	CST	Questions
1	Services: Characteristics and Nature	CP 01 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
2	Marketing Mix Elements for Services	CP 02 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
3	Service Customer Behavior	CP 03 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
4	Service Quality, Measurement & Control	CP 04 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
5	Customer Relationships		

5. Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
1	**Services: Characteristics and Nature:** Nature & definition of services, characteristics of services, service sector, growth of services in India, trends in services marketing.	CP 01
2	**Marketing Mix Elements for Services:** Inadequacy of 4 Ps, product, price, service promotion, service distribution, participants, service personnel, physical evidence, servicescape.	CP 02

3	**Service Customer Behavior:** Service decision process, customer as a decision maker Demand and Supply Management , Service capacity, demand and capacity management, strategies to deal capacity – demand imbalance	**CP 03**
4	**Service Quality, Measurement & Control:** Quality in services, measuring service quality, SERVQUAL, customer satisfaction index	**CP 04**
5	**Customer Relationships:** Service strategies, relationships in services, CRM, service recovery and empowerment.	

6. Learning Resource Details

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17033– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17033–TB1			
S17033–TB2			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17033–RB1	Services Marketing, Harsh Verma		Pearson Education.
S17033–RB2	Services Marketing , Govind Apte		Oxford university Press.
S17033–RB3	Services Marketing , S M Jha		Himalaya Publishing Company.
S17033–RB4	Services Marketing - Integrating Customer Focus across the Firm , Valarie A. Zeithaml		McGraw Hill
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17033-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17033-WL1			

S17034- Security Analysis and Portfolio Management

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17034	Security Analysis and Portfolio Management	4	44	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

4. Continuous Assessment (CA): 20 Marks
5. End Examination (EE): 80 Marks

3.Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Understand basics about investments, and capital market • Analyse and evaluate portfolio performance

4. Units

UN	Name of Unit	CST	Questions
1	Investment Basics	CP 01 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
2	Capital Market Theory & Efficient capital markets	CP 02 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
3	Fundamental analysis	CP 03 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
4	Technical Analysis	CP 04 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
5	Evaluation of Portfolio performance		

5.Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
1	**Investment Basics :** Definition, Investor life cycle and investment goals, Investment options available and their comparison, Portfolio management process, Measures of return and risk – historical rates calculation, Expected rates, required rate of return, risk free rate of return, Markowitz portfolio theory - Risk and return for one security, two security and portfolio. Efficient frontier, Investor utility	CP 01

2	**Capital Market Theory & Efficient capital markets:** Background **&** Need, EMH – forms, tests and results, Implications of efficient capital markets; Dow Theory, Random walk Hypothesis, Indian Markets and Efficiency, risk free asset, the market portfolio; capital asset pricing Model, systematic and unsystematic risk, CML, SML; Arbitrage pricing theory – empirical test of APT.	**CP 02**
3	**Fundamental analysis:** Concept, process, Economy analysis, sector analysis, company analysis; Individual stock and bond analysis – information sources, Tools and techniques of fundamental analysis, business cycle and industry analysis. Analysis of growth companies	**CP 03**
4	**Technical Analysis**: Meaning, Assumptions, advantages and challenges; Technical Indicators, rules of trading & difference between technical & Fundamental analysis, Tools and techniques for Technical analysis – Dow Theory, charting, Moving averages, Turning Points, trend lines, Oscillators & Elliot Wave Theory	
5	**Evaluation of Portfolio performance:** Concept, Measures available – Treyner, Sharpe, Jensen, performance attribution analysis, Measuring market timing skills, Evaluation of Bond portfolio performance, Strategies of great masters.	**CP 04**

6. Learning Resource Details

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17034– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17034–TB1			
S17034–TB2			
S17034–TB3			
S17034–TB4			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17034–RB1	Investment Analysis and Portfolio Management , Prasanna Chandra	2002	Tata McGraw Hill Publishers 1/E
S17034–RB2	Security Analysis and Portfolio Management, V.A.Avadhani	2007	Himalaya Publishing House
S17034–RB3	Investment Science, David G.Luenberger		Oxford Univeristy Press.
S17034–RB4	Financial Management, R.P.Rustagi		Galgotia Publication House
S17034–RB5	Investment, William Sharpe		PHI
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17034-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17024-WL1			

S17035- Project Work Stage I

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17035	Project Work Stage I	4	64	120	100	PW

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

- Continuous Assessment (CA): 20 Marks
- End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Undertake small projects which involve the activities like design, sampling etc • Explore solutions for the real problems, encountered in real life job, in the complete project execution.

4. Activities

CS	Details of Activities
1	Selection of the Project and Project Guide
2	Preparation of Project Execution Plan : Time and Resource Allocation
3	Guidance by the Project Guide, for the self-study of relevant actuarial aspects and concepts by the student.
4	Self-study of relevant actuarial topics and techniques by the student.
5	Specification by the student of the Project goal/objective, practicality, data collection plan, choice of Actuarial model to analyse, software needed for the same.
6	Guidance and approval by Project Guide for Project goal/objective, practicality, data collection plan, choice of Actuarial model to analyse, software needed for the same.
7	Decide on the size of the data to be collected vis-à-vis accuracy desired and ensure that it is practically feasible.
8	Let the student execute the data collection now as per the plan. Examine the quality and quantity of data collected. Address to the problems encountered in the data collection, if any.
9	After satisfactory completion of data collection, let student work on modeling and come up with a well-defined actuarial model statement.
10	Approval of the model by the guide.
11	Analysis of the model by the student with the intermittent help from the guide.
12	Run the analysis with the data and achieve the desired kind of result.
13	Examine if there are surprises or the possibility of an error in the process.
14	If no errors are envisaged, prepare the report.

15	Preparation of Project Report draft listing details of all the steps carried out.
16	Discussion of the Project Report draft with the Project Guide. Address all the issues of ambiguity. Suggestions for improvement/completeness.
17	Come up with the final project Report and the final submission of the same.

5. DETAIL SPECIFICATIONS

UN	Detail Specifications
1	The "Project Work" course envisages exposing the students to actual work environment, work practices during the implementation of a project. The aim is to imbibe in students the principle that working is learning. Learning and working are two sides of the same coin and thus, work experience enhances the learning.
2	**The Project Work must involve practical work related to Industrial Eng.**
3	Students are expected to work on "Project Work" for about 6 hours per week (About 4 hour's self-study at residence or time spent in the data collection and 2 hours in counseling session at study center), for **minimum** 20 days in a semester. **Thus only those projects, demanding such study efforts on all those activities, listed in above, should be selected**.
4	As students have to finance expenditure on "Project Work", normally only those projects should be selected, which involve maximum expenditure up to Rs 5000/-.
5	The original design requirements **are not essential**, although highly encouraged. Hence, normally, projects should not be repeated. The same project undertaken in recent past, by past students, should be avoided. But it is most important that, students must put his independent study efforts on the project. Thus, student should gain practical project execution knowledge about making some useful product, after he goes through all projects completion steps listed above.
6	A single student will normally do a project. The university also encourages large Joint projects, requiring the participation of a small team of students. **However, in such cases, clear delegation of work and responsibilities, among the students, must be clearly stated in the "Project Report". Maximum number of students, in a team for joint project, should not exceed 3**.
7	The student invests his energy, time and resources in a project. The project therefore should, if possible, have important bearing on some practical aspect. This will help student to justify his efforts on project.
8	Employed Students are allowed to complete "Project Work" in the industry where he is employed or his place of choice. Such a student has to identify a resource person in industry, who can take responsibility of guiding him in project work. Such person should be eligible to work as "Project Guide".
9	Study center should assist unemployed students, in locating sponsored "Projects" from local industries. Students are encouraged to locate sponsored projects from the local industries. **But, in case, a student is unable to locate such project, he is also allowed to complete "Project Work" at his study center**.
10	Each "Project Guide" may be assigned **maximum** 5 students.
11	**FORMAT FOR THE PROJECT REPORT AND SPECIFICATIONS** The format to be followed for submission of the Report is as follows: A. **Paper** a. The report shall be printed on A4 Size white paper, (Three copies to be Submitted) **B. Printing** b. The printing shall be in letter size font, double spaced on one side of the paper only, in black colour. **C. Margin** a. The pages shall have the margins: Left 35 mm, Right 20 mm, Bottom 20 mm. **D. Binding** a. The report shall be rexin bound in black color. **E. Lettering** a. The lettering shall be inscribed, on the bound back and front cover. b. The bound back shall contain the title and the name of the student in 3mm size letters. F. Front cover a. The front cover shall contain the following details b. Top-The title in black capitals of 6mm size letter, properly centered/aligned. c. Centre-Full name of the student in block capital of 3mm size letters, properly centered. **d.** Bottom-Name of the institution. Year of submission all in the block capital of 3mm size letter in separate line with spacing and properly centered. (this is the standard format) **G. Blank Sheet** a. At the beginning and the end of the report two white blank sheets & paper shall be provided one for the purpose of binding and another to be left blank.

UN	Detail Specifications

H. Title Sheet

a. 8.1 The title sheet shall be the first typed sheet and shall follow immediately the blank sheet.

I. Certificate from the guide

a. The Performa of certificate will be as follows:-

b. This is to certify that the project work titled..... (Title) is a bonafide work carried out by..... (Name of the student) a student for the Graduateship Examination of Indian Institution of Industrial Engineering under my guidance and direction.

c. Signature of Guide:

d. Name: Designation: Address: Membership No. (In case of corporate members of the Institution):

e. Date:

f. Place: (This is a standard format)

J. Abstract

a. 10.1 Every report shall have an abstract following the title sheet. The abstract shall lead the reader by highlighting the important features of the material contained in the individual chapters. The abstract shall not exceed 500 words.

K. Contents

a. 11.1 The contents shall follow the abstract indicating the title of Chapters, Section and sub-sections etc., using the decimal notation with corresponding page numbers against them.

L. List of tables

a. 12.1 The contents shall be followed by a 'List of Tables' indicating the Table number, Table title and the corresponding page number. The Table number shall be in decimal notation indicating the Chapter number and the Table number in that Chapter.

b. 12.2 Any reference within the text shall be given by quoting the relevant number, e.g. Table 2.2.

M. List of figures

a. 13.1 The 'List of Figures' shall follow 'List of Tables' indicating the Figure numbers, Figure titles and the corresponding page numbers. The Figure shall be in decimal notation indicating the Chapter number and the figure number in that Chapter. For e.g. 6.4 refers to Fig.4 in Chapter 6.

b. 13.2 Any reference within the text shall be given by quoting the relevant number, e.g. 'Fig. 6.4.'

N. Nomenclature

a. 14.1 The 'Nomenclature' follows the 'List of Figures' and contains the list of symbols used. They shall be arranged alphabetically in order of Latin letters, Greek letters, superscripts and subscripts. As far as possible generally accepted symbols shall be used. Symbols not available shall be written in permanent black ink.

O. Page numbering

a. 15.1 For items (8) to (14) the page number shall be in small Roman at 15 mm from the bottom of the page centrally located.

b. 15.2 Page numbers in Arabic numerals shall start with 2 on the second page of the introduction chapter. There shall be no numbering of pages on which new chapters begin. The number shall be at 15 mm from the top, centrally located. All pages including those containing Figures and Tables must have page numbers, serially arranged.

P. Chapter numbering

a. 16.1 The Chapter shall be numbered in Arabic numerals, Section and sub-section of any chapter shall be in decimal notation. All chapters shall begin on a new page. The titles for chapters, sections, and sub-sections shall be in block capitals. The chapter number and title shall be properly centered at the top of the page and have three spaces between them.

i. The Chapter will be constructed as Follows.

Q. Introduction to the project

a. 17.1 The first chapters will be introductory Chapter. These chapters shall highlight the importance of the investigation and also define the topic and scope of the work envisaged. A typical format for the first three chapters are shown later in the Standard Format for Report Preparation.

R. Review of Literature

UN	Detail Specifications

a. 18.1 This shall form Chapter 4. It shall present a critical appraisal of the previous work done on the topic. The extent of an emphasis on this chapter shall depend on nature of Investigation.

S. Work Done

a. 19.1 The work carried out by the student shall be presented in one more chapters depending on the nature of Investigation. A typical format will be a chapter each on Data Collection Analysis of Data Formation of Recommendation and typical format of these chapters have shown later in the specimen format for Report Preparation.

b. 19.2 Each chapter may have several sections and sub-sections with suitable titles.

c. 19.3 Important and short derivations, and representative data in tables and Figures, shall be presented in these chapters. Information such as lengthy derivations, voluminous tables and large number of figures shall be presented in the Appendix.

d. 19.4 Figures and tables shall be on separate sheets and not inserted on the papers with running text. Figures shall be in ammonia print. Depending on the size, figures and table shall be accommodated on sheets of size 210 x 297 mm or 197 x 450 or 297 x 625 mm. If there are longer tables that cannot be accommodated on these sheets, there shall be a continuation table. Very large figures shall be placed in a pouch at end of the report. All figures and table included in the Appendices shall be accordingly mentioned in the text, Lettering on figures shall be uniform either in engineering letters or typed. Each figure should be self-sufficient to provide all the information. There must be a title for every figure and table.

e. 19.5 Mathematical portions of the text shall preferably be typed. Where it is not possible, ample space shall be left, and equations and symbols shall be inserted clearly in permanent black ink.

T. Concluding chapters

a. 20.1 DISCUSSION AND CONCLUSION
   i. This chapter should include a thorough evaluation of the investigation carried out and shall clearly bring out the contribution. The discussion shall logically lead to certain conclusions and inferences. A suggested scheme of implementation should also be included. Precautions necessary while implementation should also be given.

b. 20.2 CONCLUDING REMARKS
   i. This may also include limitations of the present study and scope for further work.

U. APPENDICES

a. 21.1 Appendices shall follow item (21) and will be numbered in Roman capitals. The appendices shall normally contain detailed or lengthy derivations, sample calculations, voluminous, large figures and calculations.

V. References

a. 22.1 Bibliography shall follow the last chapter. If shall give a list of works (papers, books, etc.) referred to in the body of the text and they shall be arranged in the order they are first cited in the text. The numbering shall be in an Arabic numeral indicated as superscript along with the author's name in the text. For any paper in information shall contain the names of the authors, the title of the journal, the volume number underscored, the page number and the year of publication in parenthesis. In the case of references from journals and books in languages other than English the titles of the journals or books should be transliterated into English and not translated. For any book of the publisher, the edition, and year of publication in the parenthesis. For papers and books with joint authorship, the name of all the authors shall be reproduced in the same order. The author's name shall begin with the name followed by initials.

   i. For example: Journal
   ii. Journal
   iii. Vyas A.L., 'Fuzzy Logic' – A New Vista for Industrial Engineering, S. & Industrial Engineering News, Vol.2(2), 1995, pp. 1-15.
   iv. Books
   v. Hedge, B.K. Copen, M.R., Production Management Text and Cases, Prentice Hall of India, New Delhi, 1972, pp. 101-105.

W. ACKNOWLEDGEMENTS

a. 23.1 Acknowledgements shall follow (22) on a separate sheet. Acknowledgement shall indicate the extent to which

UN	Detail Specifications
	assistance has been received by the student in his/her work from various sources. i. The student should sign on this page. X. **SYNOPSIS** (This should be separate from the Report) a. Student to submit a new Synopsis based on the work-done. b. 24.1 Synopsis has to be typed in loose sheets, stapled and submitted along with the project report. This should give information about the project in a nutshell and should not exceed seven pages. Y. 24.2 Four copies of the project report as well as of the synopsis are to be prepared and 3 copies of each are to be submitted to the Institution. The student will hand over one of each to the Guide and retain one copy of each for himself/herself

6. Learning Resource Details

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17035– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17035–TB1			
S17035–TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17035–RB1			
S17035–RB2			
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17035-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17035-WL1			

Semester 04

S17041- Organizational Behavior

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17041	Organizational Behavior	4	44	120	100	TH

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

- Continuous Assessment (CA): 20 Marks
- End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Understand Organizational, group and Individual Behavior • Organizational Change

4. Units

UN	Name of Unit	CST	Questions
1	Organizational Behavior	CP 01 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
2	Foundations of Individual Behavior		
3	Perception		
4	Attitudes and values	CP 02 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
5	Motivation		
6	Foundations of group behaviour	CP 03 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
7	Conflict		
8	Organizational Change		
9	Organizational Development	CP 04 CSs 11 Hrs	Students have to answer '1 of 1' SAQ in CA and '1 of 1' SAQ and '1 of 2' LAQs in end exam on these units.
10	OD Techniques		

5. Detail Syllabus

UN	Detail Syllabus of the Unit	CP Block
1	**Organizational Behaviour** : The nature of organisations: Why do organisations exist? Components of organisations; Organisations as open systems, Managers in organisations, Productivity and managerial performance, Value-added managers, the manager's challenge, Organisational behaviour and the new workplace, Managing the globalisation of work, Managing human rights in the workplace, Managing developments in information technologies, Managing organisational transitions, Managing new forms of Organisation.	CP 01
2	**Foundations of Individual Behaviour** : biographical characteristics, ability, and learning.	
3	**Perception:** Introduction. Halo effect. Stereotyping. pigeonholing and compartmentalization; Self-fulfilling prophecy; Perceptual mythology; other influences on perception.	
4	**Attitudes and values** : Attitudes, Components of attitudes, Attitudes and behaviour, Attitudes and cognitive consistency, Job satisfaction as an attitude; development Values, Sources and types of values, Patterns and trends in values, Managing values and attitudes.	CP 02
5	**Motivation:** Concepts, Theories of Maslow, Helzberg. McClelland, Porter &Lawler Model, Application of Motivation Concept, Individual motivation and motivation in the organization, Cultural Differences in Motivation. Intrinsic and Extrinsic Motivation, Social Motivation. Motivation and Health. Role of motivation in human behaviour.	
6	**Foundations of group behaviour** : The nature of groups: groups and teams, informal and formal groups, purpose of teams, Teams and team building: selecting team members, team roles, stages in team development, team building, team identity, team loyalty, commitment to shared beliefs, multidisciplinary teams, Team Dynamics: group norms, decision-making behaviour, dysfunctional teams, Cohesiveness.	CP 03
7	**Conflict** : Substantive and emotional conflicts, Levels of conflict, Sources of conflict in organisations, Symptoms of conflict, Causes of conflict, Strategies for the management of conflict.	
8	**Organizational Change** : Nature, levels and dilemmas of change, Pressures for change. The Domino effect, Responses to change, Force field analysis, Change process, Resistance to change, Dynamics of change.	
9	**Organizational Development** : Goals of organisational development: Principles underlying organisational development, Ethical aspects of organisational development, The process of organisational development: Action research and organisational development, Organisational development interventions: Organisation-wide interventions, Smaller group and inter-group interventions, Individual interventions.	CP 04
10	**OD Techniques** : Traditional: Grid Training. Survey Method; Modern: Process Consultation Method, Third Party, Team Building, Transactional Analysis. **Learning and Teaching Strategy** Although the 'lecture' will provide a formal framework for each topic area, debate, discussion and participation shall be encouraged together with **case study work and group activities.**	

6. Learning Resource Details

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17041– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17041–TB1			
S17041–TB2			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17041–RB1	Organisation Behaviour, Luthans	8th	Tata McGraw Hill
S17041–RB2	Organisation Behaviour, Robbins	9th	Pearsan Education Asia
S17041–RB3	Principal of Organizational Behaviour	4th	R. Fincham-Oxford
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17041-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17041-WL1			

S17042- Project Work Stage II

1. Programme Information

SN	Description	Details
1	University	Yashwantrao Chavan Maharashtra Open University Nashik - 422 222, Maharashtra, India Website: http://www.ycmou.com/
2	School	School of Architecture, Science and Technology
3	Discipline	Technology
4	Level	UG
5	Course Used in	V47: M.Sc. (Industrial Engineering)

2. Course Information

Sem	PC	CC	Course Name	CP	CST	ST	Marks	Type
01	V47	S17042	Project Work Stage-II	16	176	480	400	PW

Teaching-Learning Support Details: Students enjoy better quality of effective learning with much greater flexibility, due to anytime anywhere learning with repetition possibility!

1. '3 online SCORM lectures' **followed by** '1 face-to-face lecture at allotted SC', for 15 weeks in a semester.
2. **Only when online SCORM lectures are not specified**, then '4 face-to-face lectures at allotted SC', for 15 weeks in a semester.
3. Each lecture shall be of 45 minutes duration.

Evaluation Pattern: Total evaluation of 100 Marks consist of

- Continuous Assessment (CA): 20 Marks
- End Examination (EE): 80 Marks

3. Presumed Knowledge and Learning Objectives

Presumed Knowledge	Learning Objectives
For successful completion of this course, student should have successfully completed: • Grad. IIIE exam or B.E. / B.Tech. or eq Pass	After successful completion of this course, student will be able to • Undertake small projects which involve the activities like design, sampling etc • Explore solutions for the real problems, encountered in real life job, in the complete project execution.

4. Activities

CS	Details of Activities
1	Selection of the Project and Project Guide
2	Preparation of Project Execution Plan : Time and Resource Allocation
3	Guidance by the Project Guide, for the self-study of relevant actuarial aspects and concepts by the student.
4	Self-study of relevant actuarial topics and techniques by the student.
5	Specification by the student of the Project goal/objective, practicality, data collection plan, choice of Actuarial model to analyse, software needed for the same.
6	Guidance and approval by Project Guide for Project goal/objective, practicality, data collection plan, choice of Actuarial model to analyse, software needed for the same.
7	Decide on the size of the data to be collected vis-à-vis accuracy desired and ensure that it is practically feasible.
8	Let the student execute the data collection now as per the plan. Examine the quality and quantity of data collected. Address to the problems encountered in the data collection, if any.
9	After satisfactory completion of data collection, let student work on modeling and come up with a well-defined actuarial model statement.
10	Approval of the model by the guide.
11	Analysis of the model by the student with the intermittent help from the guide.
12	Run the analysis with the data and achieve the desired kind of result.
13	Examine if there are surprises or the possibility of an error in the process.
14	If no errors are envisaged, prepare the report.

15	Preparation of Project Report draft listing details of all the steps carried out.
16	Discussion of the Project Report draft with the Project Guide. Address all the issues of ambiguity. Suggestions for improvement/completeness.
17	Come up with the final project Report and the final submission of the same.

5. DETAIL SPECIFICATIONS

UN	Detail Specifications
1	**Submission of Project Report.** **A.** The Project Report should be submitted within 2 years of passing section B. If the Report is not submitted within period of two years, late fee will be charged. Additional course of study may also be prescribed. The Project Report should be submitted to the institution within a period of two years from date of completion of all papers in Section B. B. The Project Report cannot be submitted until the student has passed all the papers (both Compulsory and Elective) of Section B. C. The Project Work should be done personally by the student under the approved project guide and in conformity with approved project proposal. D. A certificate from the Guide should also be enclosed in the Project Report as provided in the Format for Project Report. The Project Report should be ONLY in the Format prescribed for Project Report (See next section). E. The Collection of Data, Analysis of Data and application of techniques for the Formulation of recommendation should be clearly described in the Report. a. All steps in the analysis of the relevant theory shall be presented in the Report. While formulating the Recommendation the expected costs and benefits, the advantages and limitations of the recommendations should be clearly discussed. b. The suggested scheme for implementation of the recommendations should be clear and logically laid out with details of steps involved, time schedule of implementation, monitoring, precautions to be observed. F. A separate Synopsis of about six pages has also to be submitted along with the Project Report. G. The student should submit three hard bound copies of the Project Report (along with the synopsis) the copies of the Project Report will not be returned to the student. H. Student must work on the project at least for a period of 4 months after the approval of proposal. Reports submitted before this period will not be accepted. I. All submission of Project Report should be accompanied with an Examination fee of **Rs. 5000/- (Rupees Five Thousand Only)** in the form of crossed Demand Draft. J. Publishing Rights. K. The Project Report shall not be published before the decision of the Board of Examinations of its acceptance or otherwise. L. The Institution will have right to use the Project Report in any manner that may be deemed as expedient. M. In case, the author wishes to publish the Report, due acknowledgment to the Institution that it was a Project Report prepared for the Graduateshp Examination of the Institution has to be made by him/her.
	D. FORMAT OF THE PROJECT REPORT The format to be followed for the Report is as follows: **1. PAPER** 1.1 The Report shall be typed on white paper, A4 Size **2.1. The Project Report** A. The Project Work should be done personally by the student under the guidance of Approved Project Guide. A certificate from the Guide should also be submitted in the form specified in the Format. B. The project work is a test of the ability of the student for data collection, analysis of Data, Formulation of Recommendation and for suggesting a viable scheme for implementation of his/her recommendation. The Project Report should demonstrate these abilities. The data should be collected either by own observation and measurements or gathered from generally accepted valid first

UN	Detail Specifications
	sources like Balance Sheet, Control figures used by the Company, Performance Reports form Production, Sale Department, etc. if General Data is industry wise or national bases are used. The sources shall be quoted and should be generally accepted sources like industry Publication, Government Statistics etc. All the steps in the analysis of the relevant theory shall be indicated in the Report while formulating the Recommendations, the expected costs and benefits, the advantages and disadvantages of the recommendations etc. shall be clearly discussed. The suggested scheme for implementation of the recommendations should be clearly and logically laid out with all details of the steps involved, and time schedule for implementing the steps, precautions to be observed, monitoring etc. C. A synopsis has also to be submitted along with the Project Report. D. The Project Report should be submitted in the prescribed format which is given letter. **3. Time Limit** A. The Project Report can't be submitted until the student has passed all the papers (both compulsory and elective) of section B. B. The Project Report should be submitted to the Institution within 2 years from the date of completing all the Section B Papers. C. If the report is not submitted within two years of approval, late fee will be charged as follows:…… D. Students who completed Section B under old syllabus, should appear for two electives under Section B of the Current syllabus to become eligible for doing the project completing the Graduateship. **4. Project Report Examination Fee** The Stipulated fees, (Rs. 5000/-) for Examination of the Project including Viva should be Paid in the same along with the Project Report. **5. Examination of the Project Report** 5.1 The Examiner may report the result as a. Accepted b. Revision, Additions, Modification necessary or c. Rejected 5.2 When the Examiner requires revisions, additions, modifications, the same will be conveyed to the student who will have to comply with the examination requirements. 5.3 If satisfactorily done the examiner may recommend acceptance or otherwise he may recommend rejection. 5.4 In case of rejection the student may opt for reference to a Second Examiner with a fresh payment of the Stipulated Examination Fee. If the Second Examiners also agrees with the first examiner, the Report will be finally rejected. If the two examiners differ, then the case will be referred to the Board of Examination whose decision will be final. 5.5 If the report is finally rejected, the student will have to undertake a fess project and follow the same procedure as for his/her project, beginning with making a Proposal for Project Work.
2	**Illustrative Specimen format** 1. Title page (use standard format) 2. Certificate from guide (use standard format) 3. Abstract 4. Contents 5. List of tables 6. List of figures **Chapter 1. PREAMBLE** 1.1 Introduction 1.2 Problem on hand 1.3 Importance of the problem 1.4 Scope of the project **Chapter 2. DETAILS OF THE ORGANIZATION** 2.1 Introduction 2.2 The organization

UN	Detail Specifications
	2.2.1 Products 2.2.2 Processes 2.2.3 Facilities 2.2.4 Organization structure 2.3 Organizational business profile 2.4 Other relevant information 2.5 Conclusion **Chapter 3. THE PROBLEM ON HAND** 3.1 Introduction 3.2 Description of the problem 3.3 Details of problem 3.3.1. Historical perspective 3.3.2. Cause and effect relationships 3.3.3. Criticality of the problem 3.4 Conclusion **Chapter 4. RELEVANT LITERATURE REVIEW** 4.1 INTRODUCTION 4.2 4.3 (Presentation of material collected through review of relevant literature quoting the sources of each material) -- Say up to section 4.6 4.7 Conclusion **Chapter 5. DATA COLLECTION AND ANALYSIS** 5.1 The type of data needed 5.2 The sources for the collection of data 5.3 The details of the data collected 5.4 Processing of the data for analysis 5.5 Conclusion **Chapter 6. ANALYSIS OF DATA** 6.1 CHOICE OF TECHNIQUES Brief description of the choice of the techniques utilized and the justification for their use. 6.2 Devote one Section each to one analysis...***say upto section 6.9.*** The analysis carried out and technique utilized (give suitable Headings)(All the steps in the analysis of the Data and the relevant theory have to be shown) 6.10 CONSOLIDATED RESULTS Give a consolidated representation of result of the analysis using necessary number of sections and headings. .....***say upto section 6.14*** 6.15 GENERAL OBSERVATIONS **Chapter 7. RECOMMENDATIONS** 7.1 Brief description of Recommendations 7.2 Details of each recommendation, discussion of its technical suitability, economic justification and feasibility of implementation. (Devote one Section to each recommendation and give suitable headings. ***Say upto section 7.9*** 7.10 Suggested Scheme of Implementation, precautions and monitoring systems. (Devote one section to each recommendation and give suitable headings) **Chapter 8. DISCUSSION OF THE RESULTS** 8.1 Introduction 8.2 Overall results of the project 8.3 Overall expected benefits 8.4 Overall expected time, coast and efforts 8.5 Suggested scheme of implementation 8.6 Precautions

<table>
<tr><th>UN</th><th>Detail Specifications</th></tr>
<tr><td></td><td>8.7 Conclusion

Chapter 9. CONCLUDING REMARKS
9.1 Summary
9.2 Gains of the study
9.3 Limitations of the study
9.4 Scope for further work
REFERENCES
APPENDIX
ACKNOWLEDGEMENT</td></tr>
<tr><td>3</td><td>Specimen of Pages
<table>
<tr>
<td>Specimen 1
Project Title
M. Sc. in
Industrial Eng.
Submitted by
Name of Student
Project Guide
Name of Project Guide
Name of the Study Center
Yashwantrao Chavan Maharashtra
Open University
2012</td>
<td>Specimen 2
Certificate
This is to certify that
Mr/Ms ....
..... (SIN: .....)
has successfully completed a project entitled
"....."
in partial fulfillment for the requirement of
<table>
<tr><td colspan="2">M. Sc. in
Industrial Eng
Signature with Date</td></tr>
<tr><td>Project Guide</td><td>SC Coordinator</td></tr>
<tr><td>Internal Examiner</td><td>External Examiner</td></tr>
</table></td>
</tr>
<tr><td colspan="2">Specimen 3
Contents
1. Introduction
1.1 Objective and Scope
1.2 Need
1.3 Brief Idea
2. Data Requirement
2.1 Data items
2.2 Size
2.3 Source
2.4 Methods
2.5 Time frame of collection
3. Model Design
3.1 Model components
3.2 Component Characteristics
3.3 Component relationships
4. Model Analysis
4.1 Assumptions
4.2 Parameter estimation
4.3 Hypothesis testing
5. Result and Conclusion</td></tr>
</table></td></tr>
</table>

UN	Detail Specifications	
	6. Reference	

6. Learning Resource Details

LR Code	Title Author	Edition Year	ISBN Publisher
01. Online AV Synchronized SCORM Lectures along with Self-Test with each lecture: Core learning resource for end Exam!			
S17042– OL1	Details will be updated as and when available from the publishers		
02. Text-Books: Core learning resource for end Exam!			
S17042–TB1			
S17042–TB1			
03. Reference-Books: Explore additional details and reinforce learning, with this optional learning resource!			
S17042–RB1			
S17042–RB2			
04. CD / DVD: Explore additional details and reinforce learning, with this optional learning resource!			
S17042-CD1			
05. Web Links: Explore additional details and reinforce learning, with this optional learning resource!			
S17042-WL1			