

# Government Polytechnic, Pune

## '180 OB' – Scheme

Programme	Diploma in ET/CE/EE//ME/MT/CM/IT/DDGM
Programme code	01/02/03/04/05/06/07/08/16/17/21/22/23/24/26
Name of Course	Project
Course Code	CM4102
Prerequisite course code and name	90 CREDITS
Class Declaration	Yes

### 1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				
					Theory		Practical		Total Marks
L	T	P	C	ESE	PA	*ESE	PA		
0	0	0	04	Marks	00	00	50	50	100
0	0	4		Exam Duration	--	--	--	--	

(\*POE (Practical & Oral Examination))

**Legends:** L- lecture, T-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assessment.

### 2. RATIONALE

This subject intends to teach the students 'learning to learn' Graduate Attribute with an aim to develop attributes like confidence, initiative, ability to tackle new problems, spirit of enquire, planning and decision making skills, ability of self-directed learning which is required for lifelong learning, habit of keeping proper records and present a formal comprehensive report of their work. It also tends to mold students towards integrating the knowledge acquired throughout life and applying it to the real life projects, in order to gain the confidence of acquiring Engineering skills and thus fulfill the objective of Diploma Programme.

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### 3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

- Study Emerging trends with respect to project.
- Perform the Literature survey
- Identify the problem and present the seminar , Report writing , Project Plan
- Implement the project plan to solve the identified problem by integrating various types of skills acquired during the programme.

### 4. COURSE OUTCOMES (COs)

The practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Define the problem from Project Development point of View.
2. Apply various Design methodologies to the Projects.
3. Practice Use of Designing tools on Real problem
4. Consider the ethical issues related to seminar ( if any)
5. Assess the impact of seminar on society
6. Prepare the seminar reports with action plan and time duration.
7. Integrate various components
8. Test Various components
9. Create working Model

### 5. SUBJECT GUIDELINE REGARDING IMPLEMENTATION:

Sr.No.	Name of Experiment/Assignment
1	Project can be Hardware or Software or Combination of Both. It must involve logic building and application of various technologies learnt during Diploma Completion
2	May Form a team of students as per industry roles- Developers, testers, Business Analysts, Project managers, Customers. Assign this team a project. Each group is to be assigned a guide faculty. Project titles are to be decided in co-ordination with Faculty.
3	Student should maintain a project diary and note down all the progress steps and details in the diary. Faculty should check the diary each week and accordingly interact with students based on the progress show and keep proper nothing's. Impart proper guidance. This will assist in proper evaluation of students.
4	Evaluation of Project should be based on Topic Selection, Technical Contents and Content Understanding, Content Delivery and Response to the Questions.

<b>5</b>	<p>Students Must Submit One Hard copy and one softcopy each of Seminar report These titles are to be covered in Project Report:</p> <ol style="list-style-type: none"> <li>a. Problem Definition</li> <li>b. Platform and/Hardware Specifications</li> <li>c. Feasibility Study.</li> <li>d. Various Design UML charts/diagrams as applicable like Use Case Diagram, Activity Charts, Class Hierarchy, DFD, CFD, ER-Diagrams or any other</li> <li>e. Cost Estimation</li> <li>f. Time Estimation</li> <li>g. Limitations</li> <li>h. Use</li> <li>i. Future Scope/Extendibility</li> <li>j. Books/References/Websites</li> </ol> <p>(Other titles may be added and used as applicable, based on the nature of project)</p>
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Sr.No	Performance Indicators	Weightage in %
a.	Topic Selection	10
b.	Project diary and reporting	10
c.	Technical knowledge	10
d.	Content understanding ,	15
e.	Content Delivery , Presentation	10
f.	Efficient Designing	15
g.	Project Report Writing	10
h.	Response to Questions	10
i.	Submission of report in time	10
<b>Total</b>		<b>100</b>

## **6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED**

NA

## **7. THEORY COMPONENTS**

NA

## **8. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN**

NA

## **9. SUGGESTED STUDENT ACTIVITIES**

Following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

- a. Search information about more Emerging trends and prepare a report on it.**

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**10. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)**  
NA

**11. SUGGESTED MICRO-PROJECTS**  
NA

**12. SUGGESTED LEARNING RESOURCES**  
NA

**13. SOFTWARE/LEARNING WEBSITES**  
NA

14. **PO - COMPETENCY- CO MAPPING**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	3	1	1	1	3
CO2	3	2	3	2	-	1	-
CO3	2	2	3	2	3	3	2
CO4	2	2	3	2	3	3	2
CO5	3	2	3	2	-	2	2
CO6	3	2	-	3	1	3	3
CO7	3	2	-	3		3	3
CO8	2	2	-	3	3	3	3
CO9	2	2	-	3	3	3	3

	PSO1	PSO2
CO1	-	2
CO2	-	2
CO3	-	3
CO4	-	3
CO5	-	3

<p>Sign:</p> <p>Name: Mrs.G.B.Garud/Mrs. B. K. Vyas</p> <p>(Course Expert /s)</p>	<p>Sign:</p> <p>Name: Mr.U.V.Kokate</p> <p>(Head of Department)</p> <p>(Computer Dept.)</p>
<p>Sign:</p> <p>Name: Mr.U.V.Kokate</p> <p>(Program Head )</p> <p>(Computer Dept.)</p>	<p>Sign:</p> <p>Name: Mr. A.S.Zanpure</p> <p>(CDC )</p>

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## '180 OB' – Scheme

Programme	Diploma in ET/CE/EE//ME/MT/CM/IT/DDGM
Programme code	01/02/03/04/05/06/07/08/16/17/21/22/23/24/26
Name of Course	Seminar on Emerging trends
Course Code	CM4103
Prerequisite course code and name	90 CREDITS
Class Declaration	Yes

### 1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks	
				Theory		Practical			
L	T	P	C	ESE	PA	*ESE	PA		
0	0	0	02	Marks	00	00	25	25	50
0	0	2		Exam Duration	--	--	--	--	

(\*): OE (Oral Examination)

**Legends:** L- lecture, T-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assessment.

### 2. RATIONALE

This subject intends to teach the students 'learning to learn' Graduate Attribute with an aim to develop attributes like confidence, initiative, ability to tackle new problems, spirit of enquire, planning and decision making skills, ability of self directed learning which is required for life long learning, habit of keeping proper records and present a formal comprehensive report of their work.

### 3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

- Study Emerging trends with respect to project.
- Conduct the Literature survey
- Identify the problem and present the seminar , Report writing , Project Plan, etc

### 4. COURSE OUTCOMES (COs)

The practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Select , collect and use required information on Emerging trends.
2. Logically choose and study relevant possible Emerging trend for Seminar and project.
3. Consider the ethical issues related to seminar ( if any)
4. Assess the impact of seminar on society
5. Prepare the seminar reports with action plan and time duration.

### 5. Subject Guideline regarding implementation:

Sr.No.	Name of Experiment/Assignment
1	Seminar should be on Technical Topic only on Emerging trends with respect to the project.
2	Evaluation of Seminar should be based on Topic Selection, Technical Contents and Content Understanding, Content Delivery and Response to the Questions.
3	Students Must Submit One Hard copy and one softcopy each of Seminar report

Sr.No	Performance Indicators	Weightage in %
a.	Topic Selection	05
b.	Technical knowledge	10
c.	Content understanding	08
d.	Content Delivery , Presentation	10
e.	Report Writing	10
f.	Response to Questions	5
g.	Submission of report in time	2
<b>Total</b>		<b>50</b>

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**6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED**

NA

**7. THEORY COMPONENTS**

NA

**8. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN**

NA

**9. SUGGESTED STUDENT ACTIVITIES**

Following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

- a. Search information about more Emerging trends and prepare a report on it.**

**10. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)**

NA

**11. SUGGESTED MICRO-PROJECTS**

NA

**12. SUGGESTED LEARNING RESOURCES**

NA

**13. SOFTWARE/LEARNING WEBSITES**

NA



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14. **PO - COMPETENCY- CO MAPPING**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	-	1	1	1	3
CO2	3	2	-	2	-	1	-
CO3	2	2	-	2	3	3	2
CO4	2	2	-	2	3	3	2
CO5	3	2	-	2	-	2	2

	PSO1	PSO2
CO1	-	2
CO2	-	2
CO3	-	3
CO4	-	3
CO5	-	3

Sign: Name: Mrs.G.B.Garud/ Mrs. B. K. Vyas (Course Expert /s)	Sign: Name: Mr. U. V. Kokate (Head of Department) (Computer Dept.)
Sign: Name: Mr. U. V. Kokate (Program Head ) (Computer Dept.)	Sign: Name: Mr. A.S.Zanpure (CDC )

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## Scheme: 180 OB

Programme Name	:	Diploma Programme in CM/IT/ET
Programme Code	:	06/07/26/04
Course Title	:	Professional Practices-I
Course Code	:	CM4104
Prerequisite course code and name	:	
Class Declaration	:	No

### 1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
L	T	P	C	Theory Marks		Practical Marks		Total Marks
				ESE	PA	ESE	PA	
-	-	2	2	-	-		50	50

**Legends:** *L*-Lecture; *T* – Tutorial, *P* - Practical; *C* –Credit, *ESE* - End Semester Examination; *PA* - Progressive Assessment; # –No theory exam, \$ –online examination, \* – oral examination

### 2. RATIONALE

Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests. While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts. The purpose of introducing professional practices is to inculcate soft skills through active learning. Micro-Project, MOOCs courses, Industrial visits, expert lectures and related presentations and/ group discussions on technical topics are planned so that there will be increased, active participation of students in learning process and hence impart life-long learning ability.

### 3. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant Professional skills associated with First and second semesters courses are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Apply acquired knowledge
2. Learn independently and develop life long learning ability.
3. Work in group.
4. Learning through observations and Interactions.
5. Understand and prepare Reports.

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### 4. PRACTICALS / EXERCISES

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

Sr. No	Learning Outcome	Practical Exercises	Marks	Approx. Hrs.
1	<p>a. Application and integration of knowledge from minimum three course outcomes of two courses for development of a project.</p> <p>b. Write reports and state outcomes achieved.</p> <p>c. Work in group</p> <p>d. Present/Demonstrate project</p>	<p><b>Micro-Project –</b></p> <p><b>a) Microproject allocation and development (06-08 hrs.)</b> Faculty must allocate one real life simple problem statement(least complexity) for Microproject which is combination of application of minimum two courses learnt/being learnt during First and Second semesters to a group of 3-4 students. The problem statement must involve simple logic building which can be designed and implemented within 06-08 hours.</p> <p><b>b) Report Writing : Not more than 7-8 pages (to be prepared simultaneously with development)</b></p> <p>a. Problem Definition b. Platform and/Hardware Specifications c. Flow charts/diagram related to micro-project d. Source Code/Related Procedure for Micro-Project e. Outcome (Technical/Personal) achieved f. Books/References/Websites.</p> <p><b>c) Microproject Presentations/Demonstrations (04 hrs.)</b> (Preferrably by arranging Project exhibition/ classroom presentations as is applicable)</p>	20M	12
2	<p>a. Learn from alternate sources.</p> <p>b. Enhance self learning ability</p>	<p><b>MOOCs (Massive open online courses):</b> <b>Undertake SWAYAM/NPTEL/Spoken Tutorial/Any other Online Courses</b> learning courses and certificate courses <b>Each individual student can select any relevant online course under the guidance of course teacher as per interest areas.</b></p>	10M	10
3	<p>a. Interpersonal skill and personal skill development.</p> <p>b. Develop conflict resolution ability.</p>	<p><b>Group Activity:</b> 1. Group Activity: Case studies to be discussed in a group and presentation of the same by group and summarization by group leader.</p>	5M	06

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		2. Role play by individual/group leader. 3. Sharing of self -experiences in a group. <b>Out of above three any one activity can be conducted for group of students. Different groups can be considered for different activities based on their likings.</b>		
4	a. Learning through observations. b. Understanding professional environment. c. Report writing.	<b>Industrial Visit</b> Industrial visits must be arranged for fulfilling the requirement of programme/ course outcomes of undertaken courses of first and second semester and report of the same should be submitted by the individual student, to form a part of the term work.	07M	02
5	a. Understanding industry practices or evolving concepts. b. Report writing .	<b>Expert Lecture</b> Lectures by Professional / Industrial Expert to be organized to bridge the gap of learnt/ undertaken courses during first and second semester. Probably the Professional / Industrial Expert can be organized in the following areas - 1. Project presentation tips. 2. Spoken English. 3. Personality development. 4. How to develop positive thinking. 6. Any topic related to social awareness 7. Hygiene Awareness 7. Any other topics.	08M	02
<b>Total</b>			<b>50</b>	<b>32</b>

Sr.No.	Performance Indicators	Weightage in Marks
a.	<b>Micro-Project –</b>	20
b.	<b>MOOCs</b>	10
c.	<b>Group Activity</b>	05
d.	<b>Industry Visit</b>	07
e.	<b>Guest Lecture</b>	08
<b>Total</b>		<b>50</b>

### 5. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practicals, as well as aid to procure equipment by authorities concerned.

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## 6. SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching/PR Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Micro-Project	12	--	--	--	--
II	MOOCs: SWAYAM-NPTEL and Spoken Tutorial Courses	10	--	--	--	--
III	Group Activity	06	--	--	--	--
IV	Industrial Visit	02	--	--	--	--
V	Expert Lecture	02	--	--	--	--
<b>Total</b>		<b>32</b>	--	--	--	--

## 7. STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

- Prepare group activity Report
- Prepare Industrial Visit Report
- Prepare Guest lecture Report
- Undertake micro projects
- Undertake MOOC certifications.

## 8. SPECIAL IMPLEMENTATION/INSTRUCTIONAL STRATEGIES

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

- Microproject:
  - Teachers must brief the students about outcome expected through Microproject, form groups, and allocate micro projects to group of 3-4 within first two weeks.
  - Micro-Projects must be on a problem statement with the aim to achieve not more than three outcomes by combining outcomes from two courses. Assessment will be as per Rubrics (A) done progressively.
  - Students must utilize the allocated slots as per the course for development of Microproject. Faculty must take care that the problem statement to be developed and presented are fair enough for stipulated time duration (12hrs.)
  - Teachers may organize departmental/interdepartmental project exhibition or presentations as per convenience to enhance demonstration/presentation skills.

**NOTE: All first year and Second year faculty members prepare combined document regarding detail problem statement of Microproject. Other than this Individual Teaching Faculty may add other problem statements.**

- MOOCs : Teachers are advised to guide students into undertaking the MOOCs courses offered through various platforms. Students may take up different courses under the guideline of faculty. Faculty may take help of SWOC analysis for deciding the relevance of course allocation. Following are the guidelines , students may follow:-
  - May take technical courses for enhanced knowledge in interested areas.

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- Students requiring courses on language ability may take-up those courses
  - Students interested in Management/Entrepreneurship may opt for relevant courses.
  - Students requiring mathematical skills may opt for mathematics courses with relevant topics.
  - Faculty must motivate students to acquire certifications. If not faculty may take orals, ensure that proper outcome is being acquired and assign marks in proportion.
  - Students must use the timetable slots allotted for course and may utilize extra hours if interested.
  - Assess students performance with the help of RUBRICs (B).
- c. Guest Lecture/Industry Visit :
- Faculty must undertake Expert Lectures and Industry visit planned at start of semester by Department to fulfill gaps/knowledge and relevant skill enhancements.
  - Students must submit Report as per given format (FORMAT-Visit and FORMAT-Guest Lecture)
  - Assessment will be done as per RUBRICs(C/D ) as applicable
- d. Group activity :RUBRICs
- Faculty must assign different group activity to different groups based on their abilities and preferences. Students must complete activity , prepare report and cite acquired affective domain outcome.( Format – Group activity)
  - Faculty will guide students regarding the same.

## 9. LEARNING RESOURCES

Sr. No.	Title of Book	Author	Publication
1	Personality Development and soft skills	Barun K. Mitra Oxford University	Press
2	Entrepreneurship	Rajeev Roy Oxford University	Press
3	First Semester learnt & Second semester learning courses reference Books	--	--
4	Journals and magazines IEEE Journals, IT Technologies	--	--
5	Local newspapers and events	--	--

## 10. SOFTWARE/LEARNING WEBSITES

- a. <http://www.nptel.ac.in>
- b. <http://www.seminarforyou.com>

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## 12. PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	3	2	1	3	3
CO2	1	1	1	1	1	-	3
CO3	-	-	-	-	-	2	1
CO4	2	-	-	1	2	-	2
CO5	2	-	-	1	2	-	2

## PSO - COMPETENCY- CO MAPPING

	PSO1	PSO2
CO1	1	1
CO2	1	1
CO3	2	2
CO4	1	1
CO5	1	1

<p>(Smt. M.U.Kokate) (Smt.A.D.Kshirsagar) (Smt.A.B.Bhusagare) (Smt.Pranita Zilpe) (Smt.B.K.Vyas)</p> <p>Signature of Course Experts</p>	<p>(Mr.U.V.Kokate) Signature of Head of the Department (Computer Engineering)</p>
<p>(Mr. U. V. Kokate) Signature of Programme Head</p>	<p>(Mr. A.S. Zanpure) Signature of CDC In-charge</p>

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## Micro-Project Guidelines

1. Micro-project selection should be based on First Semester learnt and Second Semester learning courses.
2. Group of 3-4 students can work on micro-project under the guidance of Course teacher. Students can finalise micro-project topics through number of discussions with course teacher .
3. Abstract must not be greater than 100 words. Report must not be more than 7-10 pages.
4. Micro-project topics across all students must not be repeated.
5. Due care must be taken to write reports with grammatically correct statements and in neat and clean handwriting. Statement must not contain shortcuts and spelling mistakes.
6. Evaluation of Micro-project should be based on Topic Selection, Problem Definition, Requirement gathering, Development, Presentation , Report writing and Response to the Questions.
7. Micro-project Report must include
  1. Cover Page
  2. Index
  3. Abstract
  4. Chapters
  5. References/Bibliography
8. The page size of the Micro-project report should be A4 .
9. **Page Numbering (Centered having format Page No\_\_ of \_\_)**
10. **Paper Size:** A- 4 size paper

1. **Margins :**

**Top:** 1” (1 inch=2.54cm)

**Bottom:** 1.15” (2.86cm)

**Left:** 1.5”

**Right:** 0.6”

2. **Line Spacing:** 1.5 line

3. **Title of Chapter**

**Font:** Times New Roman (Bold face)

**Size:** 14 point

**Alignment:** Centre

11. **Text**

**Font:** Times New Roman

**Size:** 12 point

**Alignment:** Justified (Full Text)

12. **Figures and Tables:**

- a. **Font:** Times New Roman (**Bold**)

- b. **Size:** 12 point

- c. **Alignment:** Centered

- d. **Figure Caption must be below the figure and centered**

- e. **Table caption must be above the table and centered**



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## Assignment 1: Rubrics for Micro-project Evaluation

Topic Selection Relevant to course outcome (2)	Problem Definition (2)	Course Outcome Achievement in terms of Output (5)	Involve ment in project develop ment(2)	Presentati on (5)	Report Writing(4)	Total (20)

## Assignment 2: Rubrics for MOOCs Evaluation

Completion of Topics/ tutorial (05)	Weekly Assignment submission (10)/ Progressive assessment through internal orals	Final Certificate(05) Or final Internal orals	Total(20)

## Assignment 3: Rubrics for Group Activity

Involvement (5)	Performance(5)	Total (10)

## Assignment- 4 : Rubrics for Industrial Visit Evaluation

Note : Students who have attended Industrial Visit will only be eligible for marks assignment, else they will be marked as absent. Marks will be awarded from Reports submitted by present students only.

Discipline and Behavior (3)	Knowledge (Q & A) (5)	Report Writing(2)	Total (10)

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## **Assignment-5 :Rubrics for Professional / Industrial Expert Lecture Evaluation**

**Note : Students who have attended Lecture will only be eligible for marks assignment, else they will be marked as absent. Marks will be awarded from Reports submitted by present students only.**

<b>Representation of concepts (4)</b>	<b>Representation of best/Motivational Part(4)</b>	<b>Representation of Outcome achieved/Relevance to the course(2)</b>	<b>Total (Out of 10)</b>

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## Report Formats

### 1) Seminar/Micro-Project Report format

#### i) Cover page

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A  
Seminar Report  
On

**“SEMINAR TITLE”**

**SUBMITTED BY:**

**<Name of the student>**

**Under the Guidance of**

**<Guide Name>**

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**DEPARTMENT OF COMPUTER ENGINEERING**

## **Industry Visit Report format**

## **Government Polytechnic, Pune**

**Department of Computer Engineering**

### **Industry Visit Report**

Name of Industry Visited: \_\_\_\_\_ Date & Time of Visit: \_\_\_\_\_

Name of Student: \_\_\_\_\_ Enrollment No.: \_\_\_\_\_

Term Name: \_\_\_\_\_ Std: \_\_\_\_\_ Email-d: \_\_\_\_\_

1. Equipment Observed/Demonstrated

2. Specific Standard/processes observed in technical practices/management processes

3. Comments on Industry dressing/uniform

4. Industry Culture

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5. Sections/Divisions/offices visited along with description

6. Any observation of facilities ex. Canteen/Recreational facilities etc.

7. Can you relate the experience gathered with any course of your curriculum

State:

Course Name:

Course Code:

Details :

Specific Outcomes:

8. SAFTY MEASURESS

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**Expert Lecture Report**  
**Government Polytechnic, Pune**  
**Department of Computer Engineering**

Title of Session: \_\_\_\_\_ Speaker: \_\_\_\_\_  
Name of Student: \_\_\_\_\_ Enrollment No.: \_\_\_\_\_  
Organized By: \_\_\_\_\_ Date & Time: \_\_\_\_\_  
Venue : \_\_\_\_\_ Term: \_\_\_\_\_

1. Highlights of Technologies/Concepts introduced in session.

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2. Association of Topics/Title/Concepts with courses learnt(Mentione Cours Name).

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3. High light the best/Motivational Part:

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**Signature of Student:**

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## '1800B' – Scheme

Programme	Diploma in ET/CE/EE/ME/MT/CM/IT/DDGM
Programme code	01/02/03/04/05/06/07/08/16/17/21/22/23/24/26
Name of Course	Professional Practice-II
Course Code	CM4105
Prerequisite course code and name	-

### 1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory		Practical		Total Marks
L	T	P	C	ESE	PA	ESE	PA	
00	00	02	02	Marks	-	-	50	
				Exam Duration	-	-	-	

(\*):OE/POE (Oral Examination/Practical&Oral Examination mention whichever is applicable)

**Legends:** L- lecture, T-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assessment.

### 2. RATIONALE

Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests. While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts. The purpose of introducing professional practices is to inculcate soft skills through active learning. Micro-Project , MOOCs courses, Industrial visits, expert lectures and related presentations and/ group discussions on technical topics are planned so that there will be increased ,active participation of students in learning process and hence impart life-long learning ability.

### 3. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant Professional skills associated with First and second semesters courses are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Apply acquired knowledge
2. Learn independently and develop life long learning ability.
3. Perform SWOT analysis.
4. Learning through observations and Interactions.
5. Understand and prepare Reports.

#### 4. SUGGESTED PRACTICALS/ EXERCISES

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

Sr. No.	Learning Outcome	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1	a. Application and integration of knowledge from minimum three course outcomes of two courses for development of a project. b. Write reports and state outcomes achieved. c. Work in group d. Present/Demonstrate project	<b>Micro-Project –</b> <b>a) Microproject allocation and development (06-08 hrs.)</b> Faculty must allocate one real life simple problem statement(least complexity) for Microproject which is combination of application of minimum two courses learnt/being learnt during <b>Third and Fourth semesters</b> to a group of 3-4 students. The problem statement must involve simple logic building which can be designed and implemented within 06-08 hours. <b>b) Report Writing : Not more than 7-8 pages (to be prepared simultaneously with development)</b> a. Problem Definition b. Platform and/Hardware Specifications c. Flow charts/diagram related to micro-project d. Source Code/Related Procedure for Micro-Project e. Outcome (Technical/Personal) achieved f. Books/References/Websites. <b>c) Microproject Presentations/Demonstrations (04 hrs.)</b> ( Preferrably by arranging Project exhibition/ classroom presentations as is applicable)	CO1	12
2	a. Learn from alternate sources. b. Enhance self learning ability	<b>MOOCs(Massive open online courses):</b> <b>Undertake SWAYAM/NPTEL/Spoken Tutorial/Any other Online Courses</b> learning courses and certificate courses <b>Each individual student can select any relevant online course under the guidance of course teacher as per interest areas.</b>	CO2	10



3	a. Interpersonal skill and personal skill development. b. Develop conflict resolution ability.	<b>SWOT Analysis</b> : Self SWOT analysis <b>Study Habits (Group discussions)</b> Sharing of self -experiences in a group on Note taking, Methods of Learning, Memory Enhancement, self - Study Techniques, Techniques for effective Reading and Writing. <b>Stress Management</b> (Role play by group) Stresses in groups, how to control emotions, Strategies to overcome stress, understanding importance of good health to avoid stress. <b>Out of above three SWOT analysis is compulsory for all students . Half groups can get involved in group discussions on study habits and each group leader will present abstract to all. Half groups will present role play on stress management. Groups can be considered for different activities based on their likings.</b>	CO3	06
4	a. Learning through observations. b. Understanding professional environment. c. Report writing.	<b>Industrial Visit</b> Industrial visits must be arranged for fulfilling the requirement of programme/course outcomes of undertaken courses of first and second semester and report of the same should be submitted by the individual student, to form a part of the term work.	CO4	02
5	a. Understanding industry practices or evolving concepts. b. Report writing.	<b>Expert Lecture</b> Lectures by Professional / Industrial Expert to be organized to bridge the gap of learnt/ undertaken courses during first and second semester. Probably the Professional / Industrial Expert can be organized in the following areas - 1. Project presentation tips. 2. Spoken English. 3. Personality development. 4. How to develop positive thinking. 6. Any topic related to social awareness 7. Hygiene Awareness 7. Any other topics.	CO5	02
<b>Total</b>				<b>32</b>

Sr.No.	Performance Indicators	Weightage in Marks
a.	<b>Micro-Project –</b>	20
b.	<b>MOOCs</b>	10
c.	<b>Group Activity</b>	05
d.	<b>Industry Visit</b>	07
e.	<b>Guest Lecture</b>	08

Sr.No.	Performance Indicators	Weightage in Marks
<b>Total</b>		<b>50</b>

### 5. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practicals, as well as aid to procure equipment by authorities concerned.

### 6. SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching/PR Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Micro-Project	12	--	--	--	--
II	MOOCs:SWAYAM-NPTEL and Spoken Tutorial Courses	10	--	--	--	--
III	Group Activity	06	--	--	--	--
IV	Industrial Visit	02	--	--	--	--
V	Expert Lecture	02	--	--	--	--
<b>Total</b>		<b>32</b>	--	--	--	--

### 7. STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

- a. Prepare group activity Report
- b. Prepare Industrial Visit Report
- c. Prepare Guest lecture Report
- d. Undertake micro projects
- e. Undertake MOOC certifications.

### 7. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

- a. Microproject:
  - Teachers must brief the students about outcome expected through Microproject, form groups, and allocate micro projects to group of 3-4 within first two weeks.
  - Micro-Projects must be on a problem statement with the aim to achieve not more than three outcomes by combining outcomes from two courses. Assessment will be as per Rubrics (A) done progressively.
  - Students must utilize the allocated slots as per the course for development of Microproject. Faculty must take care that the problem statement to be developed and presented are fair enough for stipulated time duration (12hrs.)
  - Teachers may organize departmental/interdepartmental project exhibition or presentations as per convenience to enhance demonstration/presentation skills.

**NOTE: All first year and Second year faculty members prepare combined document regarding detail problem statement of Microproject. Other than this Individual Teaching Faculty may add other problem statements.**

- b. MOOCs : Teachers are advised to guide students into undertaking the MOOCs courses offered through various platforms. Students may take up different courses under the guideline of faculty. Faculty may take help of SWOC analysis for deciding the relevance of course allocation. Following are the guidelines , students may follow:-
- May take technical courses for enhanced knowledge in interested areas.
  - Students requiring courses on language ability may take-up those courses
  - Students interested in Management/Entrepreneurship may opt for relevant courses.
  - Students requiring mathematical skills may opt for mathematics courses with relevant topics.
  - Faculty must motivate students to acquire certifications. If not faculty may take orals , ensure that proper outcome is being acquired and assign marks in proportion.
  - Students must use the timetable slots allotted for course and may utilize extra hours if interested.
  - Assess students performance with the help of RUBRICs (B).
- c. Guest Lecture/Industry Visit :
- Faculty must undertake Expert Lectures and Industry visit planned at start of semester by Department to fulfill gaps/knowledge and relevant skill enhancements.
  - Students must submit Report as per given format (FORMAT-Visit and FORMAT-Guest Lecture)
  - Assessment will be done as per RUBRICs(C/D ) as applicable
- d. Group activity :RUBRICs
- Faculty must assign different group activity to different groups based on their abilities and preferences. Students must complete activity , prepare report and cite acquired affective domain outcome.( Format – Group activity)
  - Faculty will guide students regarding the same.

## 8. SUGGESTED MICRO-PROJECTS

NA

## 9. LEARNING RESOURCES

Sr. No.	Title of Book	Author	Publication
1	Personality Development and soft skills	Barun K. Mitra Oxford University	Press
2	Entrepreneurship	Rajeev Roy Oxford University	Press
3	First Semester learnt & Second semester learning courses reference Books	--	--

Sr. No.	Title of Book	Author	Publication
4	Journals and magazines IEEE Journals, IT Technologies	--	--
5	Local newspapers and events	--	--

### 10. SOFTWARE/LEARNING WEBSITES

- <http://www.nptel.ac.in>
- <http://www.seminarforyou.com>

### 11. PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	3	2	1	3	3
CO2	1	1	1	1	1	-	3
CO3	-	-	-	-	-	2	1
CO4	2	-	-	1	2	-	2
CO5	2	-	-	1	2	-	2

### PSO - COMPETENCY- CO MAPPING

	PSO1	PSO2
CO1	-	1
CO2	-	2
CO3	-	1
CO4	-	-
CO5	-	1

(Smt. U.V.Kokate) (Smt. M.U.Kokate) (Smt.A.D.Kshirsagar) (Smt.A.M.Galshetwar) (Smt.Pranita Zilpe) Signature of Course Experts	(Mr.U.V.Kokate) Signature of Head of the Department (Computer Engineering)
(Mr. U. V. Kokate) Signature of Programme Head	(Mr.A.S. Zanpure) Signature of CDC In-charge

## Micro-Project Guidelines

1. Micro-project selection should be based on Third Semester learnt and Fourth Semester learning courses.
2. Group of 3-4 students can work on micro-project under the guidance of Course teacher. Students can finalise micro-project topics through number of discussions with course teacher .
3. Abstract must not be greater than 100 words. Report must not be more than 7-10 pages.
4. Micro-project topics across all students must not be repeated.
5. Due care must be taken to write reports with grammatically correct statements and in neat and clean handwriting. Statement must not contain shortcuts and spelling mistakes.
6. Evaluation of Micro-project should be based on Topic Selection, Problem Definition, Requirement gathering, Development, Presentation , Report writing and Response to the Questions.
7. Micro-project Report must include
  1. Cover Page
  2. Index
  3. Abstract
  4. Chapters
  5. References/Bibliography
8. The page size of the Micro-project report should be A4 .
9. **Page Numbering (Centered having format Page No\_\_ of \_\_)**
10. **Paper Size:** A- 4 size paper
  1. **Margins :**

**Top:** 1” (1 inch=2.54cm)

**Bottom:** 1.15” (2.86cm)

**Left:** 1.5”

**Right:** 0.6”

2. **Line Spacing:** 1.5 line

3. **Title of Chapter**

**Font:** Times New Roman (Bold face)

**Size:** 14 point

**Alignment:** Centre

11. **Text**

**Font:** Times New Roman

**Size:** 12 point

**Alignment:** Justified (Full Text)

12. **Figures and Tables:**

a. **Font:** Times New Roman (**Bold**)

b. **Size:** 12 point

c. **Alignment:** Centered

d. **Figure Caption must be below the figure and centered**

e. **Table caption must be above the table and centered**

**Assignment 1: Rubrics for Micro-project Evaluation**

Topic Selection Relevant to course outcome (2)	Problem Definition (2)	Course Outcome Achievement in terms of Output (5)	Involvement in project development(2)	Presentation (5)	Report Writing(4)	Total (20)

**Assignment 2: Rubrics for MOOCs Evaluation**

Completion of Topics/ tutorial (05)	Weekly Assignment submission (10)/ Progressive assessment through internal orals	Final Certificate(05) Or final Internal orals	Total(20)

**Assignment 3: Rubrics for Group Activity**

Involvement (5)	Performance(5)	Total (10)

**Assignment- 4 : Rubrics for Industrial Visit Evaluation**

Note : Students who have attended Industrial Visit will only be eligible for marks assignment, else they will be marked as absent. Marks will be awarded from Reports submitted by present students only.

Discipline and Behavior (3)	Knowledge (Q & A) (5)	Report Writing(2)	Total (10)

**Assignment-5 : Rubrics for Professional / Industrial Expert Lecture Evaluation**

Note : Students who have attended Lecture will only be eligible for marks assignment, else they will be marked as absent. Marks will be awarded from Reports submitted by present students only.

Representation of concepts (4)	Representation of best/Motivational Part(4)	Representation of Outcome achieved/Relevance to the course(2)	Total (Out of 10)

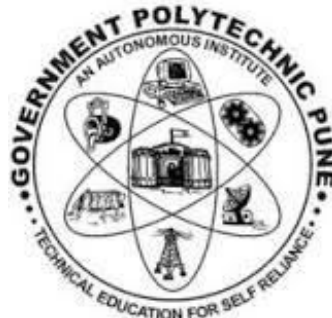
## Report Formats

### 1) Seminar/Micro-Project Report format

#### i) Cover page

**Government Polytechnic, Pune-16**

**(An Autonomous Institute of Government of Maharashtra)**



**A  
Seminar Report  
On**

**“SEMINAR TITLE”**

**SUBMITTED BY:**

**<Name of the student>**

**Under the Guidance of**

**<Guide Name>**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**Industry Visit Report format**  
**Government Polytechnic, Pune**

**Department of Information Technology**

**Industry Visit Report**

Name of Industry Visited:\_\_\_\_\_ Date & Time of Visit:\_\_\_\_\_

Name of Student: \_\_\_\_\_ Enrollment No.: \_\_\_\_\_

Term Name:\_\_\_\_\_ Std:\_\_\_\_\_ Email-d:\_\_\_\_\_

1. Equipment Observed/Demonstrated
2. Specific Standard/processes observed in technical practices/management processes
3. Comments on Industry dressing/uniform
4. Industry Culture
5. Sections/Divisions/offices visited along with description



6. Any observation of facilities ex. Canteen/Recreational facilities etc.

7. Can you relate the experience gathered with any course of your curriculum

State:

Course Name:

Course Code:

Details :

Specific Outcomes:

8. SAFETY MEASURES

**Expert Lecture Report**  
**Government Polytechnic, Pune**  
**Department of Information Technology**

Title of Session: \_\_\_\_\_ Speaker: \_\_\_\_\_  
Name of Student: \_\_\_\_\_ Enrollment No.: \_\_\_\_\_  
Organized By: \_\_\_\_\_ Date & Time: \_\_\_\_\_  
Venue : \_\_\_\_\_ Term: \_\_\_\_\_

<p>1. Highlights of Technologies/Concepts introduced in session.</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p>2. Association of Topics/Title/Concepts with courses learnt(Mention Course Name).</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p>3. State the best/Motivational Part:</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

**Signature of Student:**

# Government Polytechnic, Pune

'180 OB' – Scheme

Programme	Diploma in Computer Engineering / Information Technology
Programme code	06/07/26
Name of Course	Web development using JavaScript
Course Code	CM4106
Prerequisite course code and name	NIL
Class Declaration	No

## 1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				
					Theory		Practical		Total Marks
L	T	P	C	ESE	PA	*ESE	PA		
				Marks	-	-	25	50	75
01	01	02	04	Exam Duration	-	-	-		

(\*): POE (Practical & Oral Examination)

**Legends:** L- lecture, T-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assessment.

## 2. RATIONALE

Web pages will always be in the form of HTML. Client-side scripting including faster response times, a more interactive application, and less overhead on the web server. As web applications become larger and more complex, combined with the increasing popularity of mobile applications that run on smart phones and other mobile devices, the need for client-side scripting, JavaScript will continue to grow.

## 3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

- **Build Webpages using JavaScript.**

## 4. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant Technical skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Write JavaScript using basic syntactical constructs
2. Create forms and Control browser window features through Scripts

3. Write and Execute JavaScript for handling cookies and regular expressions for validations
4. Create Webpages with Rollovers, Status Bar, Banners and Slideshow.
5. Create web page application using Angular JS

### 5. SUGGESTED PRACTICALS/ EXERCISES

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

Sr. No.	Unit No.	Practical Exercises (Learning Outcomes in Psychomotor Domain)	Relevant CO	Approx. Hrs. Required
1.	1	Programs based on decision making statement	CO1	02
2.		Programs based on looping statement	CO1	02
3.	2	Programs based on arrays	CO1	02
4.		Programs based on functions	CO1, CO2	02
5.		Programs based on strings	CO1, CO2	02
6.	3	Program using Form Objects and form elements	CO1, CO2	02
7.		Program using Form Events	CO1, CO2	02
8.		Program using Intrinsic Java Functions	CO1, CO2	02
9.		Programs for Using and Personalizing cookies	CO4	02
10.		Programs for placing the Window on the screen.	CO4	02
11.		Programs for accessing child Window.	CO4	02
12.	4	Programs for implementing Rollovers	CO4	02
13.		Programs for implementing Banners, Slideshow Programs for implementing Status bars and Web Page Protection	CO4	02
14.		Write a JavaScript program to display the current day and time in the following format. Sample Output : Today is : Tuesday. Current time is : 10 PM : 30 : 38 Write a JavaScript program to get the current date.	CO4	02

15.	5	Writing basic application demonstrating Angular JS expressions and directives (Any 2)	CO5	02
16.		Writing Simple application using Angular JS and Forms (Any 2)	CO5	02
		Total		32

Sr.No.	Performance Indicators	Weightage in %
a.	Coding	70
b.	Designing	10
C	Answer to sample Questions	10
d.	Submit Report in time.	10
<b>Total</b>		<b>100</b>

## 6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practical, as well as aid to procure equipment by authorities concerned.

Sr. No.	Equipment Name with Broad Specifications	Experiment Sr.No.
1.	Any browser	1 to 16
2.	Any word processing IDE	1 to 16

## 7. THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency.

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>UNIT 1. An Inside Look At JavaScript Programming ( Hrs- 02)</b>	
1a. Create a JavaScript page using various control and looping structure	1.1 Getting Down To JavaScript 1.2 Values and Variables 1.3 Operators and Expressions 1.4 if Statement 1.5 switch...case Statement 1.6 Loop Statement
<b>UNIT 2 Arrays ,Functions and String (Hrs- 04)</b>	

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<p>Write a JavaScript using array and Function.</p> <p>2b. Implement various string functions.</p>	<p>2.1 Array : Declaring, Defining ,Looping The Array, Adding Array Element ,Sorting Array Elements ,Making a New Array from an Existing Array, Combining Array Elements into a String, Changing Elements of the Array.</p> <p>2. 2 Function: Defining, The Scope of Variables and Arguments, Calling a Function, Function Calling Another Function, Returning Values from a Function.</p> <p>2.3 String : Joining Strings, Dividing Text, Converting Numbers and Strings, Changing the Case of the Strings, Strings and Unicode:</p>
<p><b>UNIT 3 Forms and Event Handling, Cookies and Browser Windows ( Hrs- 04)</b></p>	
<p>3a. Develop JavaScript to handle event</p> <p>3b. Write JavaScript to handle forms using intrinsic function</p> <p>3c Manage cookies using JavaScript</p>	<p>3.1 Building Block of a Form, Responding to Form Events, Form Objects and Elements, Changing Attribute Values Dynamically, Changing Option List Dynamically ,Evaluating Check Box Selections, Manipulating Elements Before the Form, Disabling Elements, Read-Only Elements, Using Intrinsic JavaScript Functions, Changing Labels Dynamically</p> <p>3.2 Cookie Basics, Creating, Reading, Setting the Expiration Date, Deleting Personalizing and Experience Using a Cookie.</p> <p>3.3 Giving the New Window Focus, Placing an Window into Position on the Screen ,Changing the Contents of a Window , Closing the Window</p> <p>Scrolling a Web Page ,Opening Multiple Windows at Once, Creating a Web Page in a New Window</p>
<p><b>UNIT 4 Regular Expressions, JavaScript and Frames, Rollovers, Status Bar, Banners, Slideshow, Protecting Your Webpage (Hrs- 04)</b></p>	
<p>4a. Validate form using regular expressions.</p> <p>4b. Implement banners slideshow and rollovers to make website come alive</p>	<p>4.1 Regular Expression: The Language of a Regular Expression, Replace Text , Return the Matched Characters ,Using a Regular Expression</p> <p>Invisible Borders</p> <p>4.2 Calling a Child Windows JavaScript Function ,Changing the Content of a Child Window ,Changing the Focus of a Child Window, Writing to a Child Window from a JavaScript, Accessing Elements of Another Child Window</p> <p>4.3 Setting the Stage, Creating a Rollover, Text Rollovers, Multiple Actions for a Rollover, More Efficient Rollovers, Making Magic Using the Status Bar, Banner Advertisements, Creating a Slideshow</p>
<p><b>UNIT 5 Introduction to Angular JS ( Hrs- 02)</b></p>	
<p>5a. Develop a sample web page using Angular JS</p>	<p>5.1 Introduction of Angular JS, Core features of Angular JS Angular JS as MVC Architecture.</p> <p>5.2 Agular JS components: directives, expressions, controls, functions, filters</p>

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
	5.3 Creating and executing basic application using Angular JS Angular JS with tables, Forms

## 8. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	An Inside Look At JavaScript Programming	02	--	--	--	--
II	Arrays ,Functions and String	04	--	--	--	--
III	Forms and Event Handling, Cookies and Browser Windows	04	--	--	--	--
IV	Regular Expressions, JavaScript and Frames, Rollovers, Status Bar, Banners, Slideshow, Protecting Your Webpage	04	--	--	--	--
V	Introduction to Angular	02	--	--	--	--
<b>Total</b>		<b>16</b>	--	--	--	--

## 8. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

- Prepare journal based on practical performed in laboratory.
- Follow Coding Standards.
- Undertake micro-projects.
- Develop variety of program to improve logical skills.
- Develop Application oriented real-world programs.

## 9. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

- Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
- About **15-20% of the topics/sub-topics** which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
- With respect to item No.8, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.

- d. Guide student(s) in undertaking micro-projects.
- e. Correlate subtopics with power plant system and equipment.
- f. Use proper equivalent analogy to explain different concepts.
- g. Use Flash/Animations to explain various components, operation and
- h. Teacher should ask the students to go through instruction and Technical manuals

## 10. SUGGESTED MICRO-PROJECTS

MINI PROJECT: Implement mini project using all the client-side scripting concepts studied in the above units.

## 11. SUGGESTED LEARNING RESOURCES

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Jim Keogh	Javascript Demystified, Tata McGraw Hill	ISBN: 0072254548
2	Michael Moncur	Javascript in 24 hours(SAMS teach yourself) TechMedia	TechMedia
3	Shyam Seshadri, Brad Green	Angular JS	ISBN: 9781449344856

## 13. SOFTWARE/LEARNING WEBSITES

1. <http://www.nptel.ac.in>
2. <https://www.tutorialspoint.com/>

## 14.PO - COMPETENCY- CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	1	1	1	1	-	1
CO2	3	2	3	3	1	2	1
CO3	3	2	3	3	1	2	2
CO4	3	2	3	3	1	2	1
CO5	3	2	3	3	1	2	2
<b>Summary</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>



## 15. PSO - COMPETENCY- CO MAPPING

	<b>PSO1</b>	<b>PSO2</b>
<b>CO1</b>	-	3
<b>CO2</b>	-	2
<b>CO3</b>	-	2
<b>CO4</b>	-	2
<b>CO5</b>	-	3
<b>CO6</b>	-	2
<b>Summary</b>	-	2

Sign: Name: 1. Mrs. M.U Kokate 2. Smt. M. G. Yawalkar 3.. Smt. A. S. Paik  (Course Expert /s)	Sign: Name: Mr.U.V.Kokate (Head of Department ) (Computer Dept.)
Sign: Name: Mr.U.V.Kokate (Program Head ) (Computer Dept.)	Sign: Name: Mr. A.S.Zanpure (CDC In-charge)

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# Government Polytechnic, Pune

## '180 OB' – Scheme

Programme	Diploma in ET/CE/EE//ME/MT/CM/IT/DDGM
Programme code	06/26
Name of Course	Software Engineering and Testing
Course Code	CM4107
Prerequisite course code and name	-

### 1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				
					Theory		Practical		Total Marks
L	T	P	C	ESE	PA	*ESE	PA		
04	00	02	06	Marks	80	20	25	25	150
				Exam Duration	3 Hrs	1 Hr			

(\*): OE (Oral Examination)

*Legends: L- lecture-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assessment.*

### 2. RATIONALE

Software has become the key element in the evolution of Computer-based systems and products. Over the past 50 years, software has evolved from a specialized problem solving and information analysis tool to an industry in itself. Software is composed of programs, data and documents.. The intent of software engineering is to provide a framework for building software with higher quality.

Software testing will introduce you to basic of software testing, teaching you not just the fundamentals of teaching skills but also supporting skills necessary to become a successful software tester .You will learn how to immediately find problems in any computer program, how to plan an effective test approach, how to clearly report your finding, and to tell when your software is ready for release.

### 3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

- Use relevant process model for developing software products and apply different testing techniques on developed software product.
-

#### 4. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Select relevant software process model for software development.
2. Prepare software requirement specification and use UML Modeling for software design.
3. Estimate size and cost of software product.
4. Apply various software testing techniques.
5. Prepare test plan for an application.
6. Identify bugs to create defect report for an application.

#### 5. SUGGESTED PRACTICALS/ EXERCISES

The practical's in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1.	1	Develop software project using any process model.	1	04
2.	2	Create Software Requirement Specification for assigned project	2	02
3.	2	Develop DFDs, Use Case and Activity diagram for assigned project.	2	04
4.	2	Develop Class, Sequence and collaboration diagram for assigned project.	2	04
5.	2	Develop State transition, Component and Deployment diagram for assigned project.	2	02
6.	3	Estimate cost for assigned project using any decomposition technique.	3	02
7.	5	Write a program and design test cases for white box testing to following control structures. 1) For... Loop 2) Switch...case 3) Do...While 4) If...else	4	02
8.	5	Design test cases for back box testing for assigned project.	4	02
9.	5	Design test cases for any Web Site.	4	02
10.	5	Design test cases for Regression testing on any web page.	4	02
11.	6	Design Test plan for any application	5	02
12.	6	Prepare defect report after executing test cases for any application.	6	02
13.	4	Write test scripts for any web page using Selenium automation tool.	4	02
		<b>Total Hrs</b>		<b>32</b>

Sr.No.	Performance Indicators	Weightage in %
a.	Installation and configuration of any UML design tool and software testing tool.	10
b.	Designing UML diagrams and writing test cases.	40
c.	Quality of result displayed.	30
d.	Answer to sample questions.	10
e.	Submission of assignment in time.	10
<b>Total</b>		<b>100</b>

## 6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practical, as well as aid to procure equipment by authorities concerned.

Sr.No.	Major Equipment/ Instruments Required	PrO. No.
1	Hardware: Personal Computer (i3 to i5 preferable ,RAM Minimum 2 GB	For All Experiments
2	Operating System: Windows 7 / Windows 8 / Windows 10/Linux or Any Other	
3	Software Tools: Any UML Tool	
4	Software Testing Automation Tools: Any Open Source Testing Tool(Selenium)	

## 7. THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency.

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>UNIT 1. INTRODUCTION TO SOFTWARE ENGINEERING</b> (Weightage-12 , Hrs- 08)	
1a. Define Software and its characteristics 1b. Identify and Demonstrate need Umbrella Activities 1c. Analyze various process, methods and tools 1d. Choose and apply domain specific life cycle model for software product development.	1.1 Evolving role, characteristics and applications of software. 1.2 Software Engineering-A Layered Technology, A process framework. 1.3 Process Models- Waterfall model, Incremental Model RAD Model, Prototyping , Spiral Model, Concurrent Development Model, Component based Development, 1.4 Agile Process Models- Extreme Programming, Adaptive Software development, Scrum, Crystal.
<b>UNIT 2 REQUIREMENT , DESIGN AND MODELLING ENGINEERING</b> (Weightage- 14 , Hrs- 08)	

<p>2a. Define Customer need – Requirement and state various tasks</p> <p>2b. Use various requirement gathering techniques</p> <p>2c. Use &amp; Design use case for Requirement Elicitation</p> <p>2d. Validate Requirement and Build Analysis model (SRS)</p> <p>2e. Design UML Diagrams for software projects</p>	<p>2.1 Requirement Engineering Tasks-Inception, Elicitation, Elaboration, Negotiation, Specification, Validation</p> <p>2.2 Eliciting Requirements- Collaborative Requirements Gathering, Quality Function Deployment ,User Scenarios ,Elicitation Work Products</p> <p>2.3 Software Requirement Specification- Need of SRS, Template of SRS</p> <p>2.4 Design Concepts- Abstraction, Architecture, Patterns, Modularity, Information Hiding</p> <p>2.5 UML Modeling- Data flow diagram, Class diagram, Sequence diagram, Use case diagram, Activity diagram , State chart diagram, Component diagram, Deployment diagrams</p>
<p><b>UNIT 3 SOFTWARE PROJECT MANAGEMENT ,SCHEDULING AND QUALITY ASSURANCE</b> (Weightage- 16 , Hrs- 08)</p>	
<p>3a. Recognize need of Software project Management.</p> <p>3b. Apply various techniques for Estimation</p> <p>3c. Determine Size using Function-Point metric and Cost Estimation using COCOMO model.</p> <p>3d. Design and implement RMMM Plan</p> <p>3e. Describe steps for Project</p> <p>3f. Scheduling, and tracking</p> <p>3g. Describe Software Quality Assurance</p>	<p>3.1 The Management Spectrum: The people, The product, The Process, The project</p> <p>3.2 Decomposition Techniques-LOC and FP based estimation, COCOMO model</p> <p>3.3 Risk Management: Software risk, Risk Identification, RMMM(Risk Mitigation, Monitoring and Management)</p> <p>3.4 Project Scheduling -Basic principles of scheduling</p> <p>3.5 Project Tracking- Timeline chart, Gantt chart</p> <p>3.6 Software Quality Assurance-The-ISO 9001 standard ,Six Sigma for Software Engineering</p>
<p><b>UNIT 4 BASICS OF SOFTWARE TESTING AND AUTOMATION TESTING</b> (Weightage- 10 , Hrs- 08)</p>	
<p>4a. Identify need of testing in software development.</p> <p>4b. Analyze the quality of Software.</p> <p>4c. Discover how to improve testing efficiency by automating your test.</p> <p>4d. Test software using automated test tools.</p>	<p>4.1 Software Testing-Objectives, Error and bug terminology</p> <p>4.2 The Fundamental Test Process</p> <p>4.3 Quality Assurance and Quality Control, Testing, Verification and Validation.</p> <p>4.4 Automation Testing : Introduction, Features of test tool, Guideline for selecting a tool</p> <p>4.5 Static and dynamic testing tool, Advantages and Disadvantages of using tools, When to use Automated test tools.</p>
<p><b>UNIT 5 TYPES OF TESTING</b> (Weightage- 14 , Hrs- 08)</p>	
<p>5a. Test software using different testing techniques</p> <p>5b. Test software for Acceptance testing.</p> <p>5c. Test software for System Testing</p> <p>5d. Test software using Special Testing techniques.</p>	<p>5.1 White box testing -Static testing , dynamic testing</p> <p>5.2 Black box testing- Requirement based testing, Positive and Negative testing, Boundary value analysis, Decision tables, Equivalence partitioning, User documentation testing.</p> <p>5.3 Integration testing- Top-Down and Bottom-Up integration,</p> <p>5.4 Acceptance testing-Alpha and Beta Testing, Acceptance testing</p> <p>5.5 System Testing- Performance testing, Stress testing, Recovery testing, Compatibility testing, Security testing, Usability testing.</p> <p>5.6 Special Tests: Smoke and Sanity testing, Regression testing, GUI testing, Object oriented application testing, Client-Server testing, Web based testing.</p>

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**UNIT 6 TEST MANAGEMENT AND DEFECT MANAGEMENT (Weightage- 14 , Hrs- 08)**

6a. Prepare test plan for given application. 6b. Describe Test management process 6c. Find Defect using different technique. 6d. Describe Defect Life cycle	6.1 Test Planning-Preparing a test plan, Scope management, Deciding test approach, Setting up criteria for testing, Identifying Responsibilities, Staffing, Training needs, Resource requirements, Test deliverables, Testing tasks. 6.2 Test Management: Choice of standards, Test infrastructure management, Test people management , integrating with product release. 6.3 Test Process: Base lining a test plan, Test case specification, Update of Traceability matrix 6.4 Test Reporting: Recommending product release, Executing test cases, Collecting and analyzing metrics, Preparing test summary report. 6.5 Defect Management-Introduction, Defect classification, Defect management process. 6.6 Defect life cycle, Defect template.
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**8. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN**

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction to software engineering	08	2	4	6	12
II	Requirement , design and modeling engineering	08	4	4	6	14
III	Software project management ,scheduling and quality assurance	08	4	4	8	16
IV	Basics of software testing and automation testing	08	2	4	4	10
V	Types of testing	08	4	4	6	14
VI	Test and defect management	08	4	4	6	14
<b>Total</b>		<b>48</b>	<b>20</b>	<b>24</b>	<b>36</b>	<b>80</b>

**9. SUGGESTED STUDENT ACTIVITIES**

Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

- a. Prepare journals based on practical's performed in laboratory.

**10. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)**

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

- a. Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
- b. About **15-20% of the topics/sub-topics** which is relatively simpler or descriptive in nature is to be given to the students for **self-directed learning** and assess the development of the COs through classroom presentations (see implementation guideline for details).
- c. With respect to item No.8, teachers need to ensure to create opportunities and provisions for **co-curricular activities**.
- d. Guide student(s) in undertaking micro-projects.
- e. Correlate subtopics with power plant system and equipments.
- f. Use proper equivalent analogy to explain different concepts.
- g. Use Flash/Animations to explain various components, operation and
- h. Teacher should ask the students to go through instruction and Technical manuals

## 11. SUGGESTED MICRO-PROJECTS

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**(Only for Class Declaration Courses)**

*Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her. In the first four semesters, the micro-project are group-based. However, in the fifth and sixth semesters, it should be preferably be **individually** undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. In special situations where groups have to be formed for micro-projects, the number of students in the group should **not exceed three**.*

*The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. Each student will have to maintain dated work diary consisting of individual contribution in the project work and give a seminar presentation of it before submission. The total duration of the micro-project should not be less than **16 (sixteen) student engagement hours** during the course. The student ought to submit micro-project by the end of the semester to develop the industry oriented COs.*

*A suggestive list of micro-projects is given here. Similar micro-projects could be added by the concerned faculty:*

- a. Identify the Problem Statements and Prepare SRS for given software.
- b. Choose relevant process Model for given software development.
- c. Apply testing techniques to test given software.

## 12. SUGGESTED LEARNING RESOURCES

S.N .	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Software Engineering 6th Edition	Roger S. Pressman, Mc. Graw Hill	
2	Srinivasan Desikan Gopaldaswamy Ramesh	Software Testing: Principles and Practices, Pearson,2006	

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### 13. SOFTWARE/LEARNING WEBSITES

1. <https://nptel.ac.in/courses/106105087/>
2. <https://nptel.ac.in/courses/106/105/106105150/>
3. <https://www.softwaretestinghelp.com/selenium-tutorial-1/>

### 14. PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	2	3	2	2	3	3
CO2	3	3	2	3	2	3	3
CO3	2	2	2	2	2	3	3
CO4	2	2	3	3	1	3	3
CO5	2	2	2	3	1	3	3
CO6	2	3	2	3	3	3	2

	PSO1	PSO2
CO1	-	3
CO2	-	3
CO3	-	3
CO4	-	3
CO5	-	3

Sign:  Name: Mrs. R.J Chavan Mrs. S.B Gosavi  (Course Expert /s)	Sign:  Name Mr. U.V.Kokate  (Head of Department)
Sign:  Name:  (Program Head ) (Computer Dept.)	Sign:  Name: Shri A.S.Zanpure  (CDC )



# Government Polytechnic, Pune

## '180 OB' – Scheme

Programme	CM
Programme code	06/26
Name of Course	Advanced Computer Network
Course Code	CM4108
Prerequisite course code and name	CM3108
Class Declaration	Yes

### 1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				
L	T	P			C	Theory		Practical	
L	T	P	C	Marks	ESE	PA	*ESE	PA	Total Marks
04	00	02	06	80	25	25	25	25	150
				Exam Duration	3 Hrs.	1 Hrs.	2 Hrs.		

(\*): Oral Examination

**Legends:** L- lecture, T-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assessment.

### 2. RATIONALE

This course is aimed at providing the students with conceptual understanding of issues of Computer Networks with respect to Network and above layers of TCP/IP model. It aims at providing in depth knowledge of Network Organization, addressing, Security and role of various protocols in Internetworking Environment.

### 3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

- **Maintain the networking environment .**

### 4. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Learn Setting up of a network.
2. Learn the use of Internet Protocol.
3. Configure Static as well as Dynamic IP Addresses
4. Learn how World Wide Web is organized
5. Compare the different interconnecting systems throughout the world.
6. Understand various security and protection issues in the Networking Environment.

## 5. SUGGESTED PRACTICALS/ EXERCISES

The practical's in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1.	1	Study of Router , Gateway and switches with its specification	1	02
2.		Study of available ISP's in India	1	02
3.	2	Design Network using the sub networking	2	04
4.		Configure Static IP address and Dynamic IP address using DHCP	3	04
5.	4	Configure FTP server	1	04
6.	3	Configure Telnet	1	02
7.		Study and Configure POP3, IMAP and SMTP protocol	4,5	04
8.	5	Study Network monitoring tools( IDS )	6	04
9.	5	Study of RIP Simulator	6	02
10.	6	Write a program to design symmetric and asymmetric key cryptography.	5	04
Total Hrs.				32

S.No.	Performance Indicators	weightage in %
a.	Learn Setting up of a network.	20
b.	Learn the use of Internet Protocol.	20
c.	Configure Static as well as Dynamic IP Addresses	10
	Learn how World Wide Web is organized	10
d.	Compare the different interconnecting systems throughout the world.	20
e.	Understand various security and protection issues in the Networking Environment	10
f.	Submission of report in time	10
<b>Total</b>		<b>100</b>

## 6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practical, as well as aid to procure equipment by authorities concerned.

Sr.No.	Major Equipment/ Instruments Required	PrO. No.
1	Computers	ALL
2	Networking (Internet )	ALL

## 7. THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency.

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>UNIT 1. Network Layer I (Weightage-14 , Hrs.- 12)</b>	
<p>1a. Define Logical addresses development</p> <p>1b. Explain NAT and its use</p> <p>1c. Distinguish between IPV4 and IPV6</p> <p>1d. Choose between RARP, BOOTP and DHCP</p>	<p><b>1.1 Logical Addressing:</b> IPv4 Addresses- Address space, Notations, classful addressing, classless addressing, Network address translation(NAT), IPv6 Addresses- Structure, Address space</p> <p><b>1.2 Internetworking:</b> Need for Network Layer, Internet as a Datagram network, Internet as a Connectionless Network, IPv4- Datagram, Fragmentation, Checksum, Options IPv6- Advantages, Packet format, Extension headers, Transition from IPv4 to IPv6- Dual Stack, Dual Stack, Tunneling, Header translation</p> <p><b>1.3 Address Mapping:</b> Mapping Logical to Physical Addresses-ARP, Mapping Physical to Logical Addresses – RARP,BOOTP and DHCP</p>
<b>UNIT 2. Network Layer II (Weightage-14 , Hrs.- 12)</b>	
<p>2a. List error reporting and query messages.</p> <p>2b. compare direct and indirect delivery.</p> <p>2c. Explain use of routing table.</p> <p>2d. compare multicasting and broadcasting.</p>	<p><b>2. 1 ICMP-:</b> Types of messages, Message format, Error reporting, Query</p> <p><b>2.2 Delivery:</b> Direct vs Indirect Delivery</p> <p><b>2.3 Forwarding-</b> forwarding Techniques, Forwarding Process, Routing Table, Unicast</p> <p><b>2.4 Routing Protocols:</b> Optimization, Intra and Interdomain Routing, Distance Vector Routing, Link State Routing, Path Vector Routing</p> <p><b>2.5 Introduction to multicasting and broadcasting.</b></p>
<b>UNIT 3 Transport Layer (Weightage-12 , Hrs.- 08)</b>	

<p>3a. Explain process to process delivery</p> <p>3b. Compare Multiplexing and demultiplexing</p> <p>3c. Compare Connection oriented and Connectionless services</p> <p>3d. Discover TCP and UDP protocols</p> <p>3e. Categorize network traffic</p> <p>3f. Prove best congestion control method</p> <p>3g. Explain techniques to improve QOS</p>	<p><b>3.1</b> Process to Process : Delivery Client/Server Paradigm, Multiplexing and demultiplexing, Connectionless vs. Connection-Oriented Service, Reliable vs. Unreliable.</p> <p>Three Protocols, User Datagram Protocol(UDP)- Well Known Ports for UDP, User Datagram, Checksum, UDP Operation, Use of UDP, TCP- TCP Services, TCP Features, Segment, A TCP Connection, Flow Control, Error Control, Congestion Control</p> <p><b>3.2</b> Data Traffic: Traffic Descriptor, Traffic profiles</p> <p><b>3.3</b> Congestion: Network Performance, Congestion Control- Open Loop Congestion Control, Closed Loop Congestion Control, Examples- Congestion Control in TCP and Frame Relay</p> <p><b>3.4</b> Quality of Service: Flow Characteristics, Flow Classes, Techniques to Improve QoS- Scheduling, Traffic shaping, Resource Reservation, Admission Control.</p>
<p><b>UNIT 4 Application Layer I: DOMAIN NAME SYSTEM(Weightage-14, Hrs.- 12)</b></p>	
<p>4a. Define name space in WWW.</p> <p>4b. Recall working of internet</p> <p>4c. Demonstrate caching work in DNS</p> <p>4d. Apply remote logging in troubleshooting networking problems</p> <p>4e. Design Email application</p> <p>4f. Compare POP and IMAP</p> <p>4g. Elaborate FTP protocol.</p>	<p><b>4.1</b> Name Space: Flat Name Space, Hierarchical Name Space, Domain Name Space- Label, Domain Name, Domain, Distribution of Name Space- Hierarchy of Name Servers, Zone, Root Server, Primary and Secondary Servers</p> <p><b>4.2</b> DNS in the Internet: Generic Domains, Country Domains, Inverse Domain, Resolution- Resolver, Mapping names to Addresses, Mapping Addresses to Names, Recursive resolution, Iterative Resolution, Caching,</p> <p><b>4.3</b> DNS Messages: Header, Types of Records- Question Record, Resource Record, Registrars, Dynamic, Domain Name Systems(DDNS), Encapsulation</p> <p><b>4.4</b> REMOTE LOGGING: Remote logging, Telnet</p> <p><b>4.5</b> ELECTRONIC MAIL AND FILE TRANSFER: Electronic Mail- Architecture, User Agent, Message Transfer Agent: SMTP, Message Access Agent: POP and IMAP, Web-based Mail</p> <p><b>4.6</b> File Transfer-File Transfer Protocol(FTP), Anonymous FTP</p>
<p><b>UNIT 5 Application Layer II:WWW AND HTTP (Weightage- 12 , Hrs.- 08)</b></p>	

<p>5a. Illustrate how cookies work</p> <p>5b. Differentiate between Static Documents and Active Documents.</p> <p>5c. Explain Proxy Server</p> <p>5d. Demonstrate how 3 Network Management is done.</p>	<p><b>5.1 Architecture:</b> Client(Browser), Server, Uniform Resource Locator, Cookies</p> <p><b>5.2 Web Documents:</b> Static Documents, Active Documents, HTTP- HTTP Transaction, Persistent vs. No persistent Connection, Proxy Server</p> <p><b>5.3 Network Management System:</b> Configuration Management, Fault Management, Performance Management, Security and Accounting Management,</p>
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**UNIT 6 Cryptography and Security in the Internet (Weightage- 14 , Hrs.- 12)**

<p>6a. Illustrate the importance of security</p> <p>6b Define cryptography</p> <p>6c. Explain security services</p> <p>6d. Justify the use of proxy firewall.</p>	<p><b>6.1 Introduction</b> to Cryptography: Definitions, Categories, Symmetric Key Cryptography- Traditional Ciphers, Simple Modern Ciphers, Asymmetric –Key Cryptography- RSA, Diffie-Hellman.</p> <p><b>6.2 Security</b> Services: Message confidentiality, Message Integrity, Message Authentication, Message Nonrepudiation, Entity Authentication. IPSecurity(IPSec)- Two modes, Two Security protocols, Security Association</p> <p><b>6.3 PGP</b>-Security Parameters, Services, A Scenario, PGP Algorithms, Key Rings, PGP Certificates</p> <p>Firewalls- Packet filter firewall, Proxy firewall.</p>
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**8. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN**

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Network Layer I	12	10	02	02	14
II	Network Layer II	12	10	02	02	14
III	Transport Layer	08	10	02	00	12
IV	Application Layer I: DOMAIN NAME SYSTEM	12	10	02	02	14
V	Application Layer II: WWW AND HTTP	08	08	02	02	12
VI	Cryptography and Security in the Internet	12	10	02	02	14

<b>Total</b>	64	58	12	10	80
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## 9. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

- a. Prepare journals based on practical performed in laboratory.
- b. Analysis of real time networking laboratories and organizations (cyber café)

## 10. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

- a. Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
- b. About *15-20% of the topics/sub-topics* which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
- c. With respect to item No.8, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
- d. Use proper equivalent analogy to explain different concepts.  
Use Flash/**Animations** to explain various components, operation and
- e. Teacher should ask the students to go through instruction and Technical manuals

## 11. SUGGESTED MICRO-PROJECTS

NOT APPLICABLE

## 12. SUGGESTED LEARNING RESOURCES

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Data Communication and Networking	Behrouz A. Forouzan, McGraw-Hill Higher Education, 4 <sup>th</sup> Edition, January 2007	<u>978-0072967753</u>
2	Networking The Complete Reference	Bobbi Sandberg, Tata McGraw Hill, 3rd Edition, June 24, 2015	9339222199 ,9789339222192

### 13. SOFTWARE/LEARNING WEBSITES

- 1 [www.nptel.com](http://www.nptel.com)
- 2 [https://www.tutorialspoint.com/data\\_communication\\_computer\\_network/](https://www.tutorialspoint.com/data_communication_computer_network/)
- 3 <http://en.citizendium.org/wiki/Cryptography>
- 4 <http://www.tutorialspoint.com/cryptography/>

### 14. PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	-	2	2	-	-	2
CO2	2	-	2	2	-	-	3
CO3	2	3	2	3	-	-	2
CO4	1	-	-	-	-	-	2
CO5	2	2	2	2	1	-	2
CO6	-	-	-	-	3	2	2

	PSO1	PSO2
CO1	3	-
CO2	3	-
CO3	3	-
CO4	-	3
CO5	-	3
CO6	-	3

Sign: Name: Smt.B.K.Vyas/ Smt. A. A. Shaikh (Course Expert /s)	Sign: Name: Mr.U.V.Kokate (Head of Department) (Computer Dept.)
Sign: Name: Mr.U.V.Kokate (Program Head) (Computer Dept.)	Sign: Name: Mr. A.S.Zanpure (CDC)



# Government Polytechnic, Pune

## '180 OB' – Scheme

Programme	Diploma in ET/CE/EE//ME/MT/CM/IT/DDGM
Programme code	01/02/03/04/05/06/07/08/16/17/21/22/23/24/26
Name of Course	Java Programming-II
Course Code	CM4109
Prerequisite course code and name	CM3102- Java Programming-I
Class Declaration	Yes

### 1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				Total Marks
					Theory		Practical		
L	T	P	C		ESE	PA	*ESE	PA	
				Marks	80	20	25	25	150
03	01	02	06	Exam Duration	3 Hrs	1 Hr	2 Hr		

**(\*)**: POE (Practical&Oral Examination)

**Legends:** L- lecture, T-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assessment.

### 2. RATIONALE

This course introduces students to intermediate and advanced features of the Java programming language. Student will know how to implement graphical user interfaces using Java components. In the Era of Web technology it is essential for every diploma Engineer to have knowledge of Internet programming. This course covers advanced features of JAVA.

### 3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

- **Develop standalone Applications using advanced concepts of Java.**

#### 4. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Develop GUI applications using Abstract Windowing Toolkit (AWT) and event handling.
2. Create GUI applications using Swing.
3. Develop client/server applications using TCP/IP and UDPsocket programming.
4. Implement Java programs using databases with Java Data Base Connectivity (JDBC) as interface.
5. Develop applications for Remote Method Invocation (RMI).
6. Implement Java programs using Servlets.

#### 5. SUGGESTED PRACTICALS/ EXERCISES

The practical's in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1.	1	Program to design a form using various controls.	CO1	02
2.		Program to design a form using different Layouts manager.		01
3.		Program to display any string using available Font and Font metrics class and their methods.		02
4.		Program to create a menu bar with various menu items and sub menu items. Also create a checkable menu item. On clicking a menu Item display a suitable Dialog box.		02
5.	2	Program to design a form using basic swing components.	CO1,CO2	02
6.		Program to demonstrate the use of tabbed panes and scroll panes in Swing .		02
7.		Program to map Directory tree and Table.		02
8.	3	Program to retrieve hostname using methods in InetAddress class.	CO3	02
9.		Program to demonstrate use of URL and URL Connection class for communication.		02
10.		Program that demonstrates TCP/IP and UDP based communication between client and server.		02
11.	4	An Application program to make connectivity with database using JDBC API.	CO4	01
12.		Application programs to send queries through JDBC bridge & handle result.		02
13.	5	Create a Client/Server application using RMI .	CO5	02

14.	6	Program to demonstrate the use of HttpServlet as a parameterized Servlet.	CO6	02
15.		Program to send username and password using HTML forms and authenticate the user using Servlet.		02
16.		Program to create session using HttpSession class.		02
17.		Program to implement Session tracking using Cookies.		02
		<b>Total Hrs</b>		<b>32</b>

Sr.No.	Performance Indicators	Weightage in %
a.	Correctness of Program	40
b.	Debugging ability	20
c.	Quality of input and output displayed (messaging and formatting)	10
d.	Preparing assignments (write-ups, program and output).	20
e.	Submit assignment on time.	10
<b>Total</b>		<b>100</b>

## 6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practical's, as well as aid to procure equipment by authorities concerned.

Sr. No.	Equipment Name with Broad Specifications	Experiment Sr.No.
1.	Computer System with operating System & any latest JDK version to execute "Java" programs,	1 to 17
2.	Notepad	1 to 17
3.	Databases like Oracle, Mysql, Ms-access or any other	11 to 12
4.	Apache Tomcat server version 7 or above web server	14 to 17

## 7. THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency.

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>Section - I</b>	
<b>UNIT 1. Abstract Windowing Toolkit (AWT)(Weightage-20 , Hrs- 12)</b>	
1a. Enlist various AWT components. 1b. Describe Event Delegation Model. 1c. Describe various handling events by extending AWT 1d. Design a form containing	1.1 Introduction to AWT, AWT classes, Window fundamentals, working with frame Windows, Creating a frame Window in an Applet, Creating windowed program. 1.2 Display information within a window 1.3 Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, Checkbox Group, Choice Controls, Using Lists, managing scroll Bars, Using a Text Field, Using a

various AWT components and apply event handling.	Text Area. 1.4 Understanding Layout Managers, Menu Bars and Menus, Dialog Boxes, File Dialog. 1.5 The delegation event model, Event classes, Sources of Events, Event Listener Interfaces. 1.6 Handling events by Extending AWT Components, Exploring the Controls, Menus, and Layout manager. 1.7 Adapter classes, Inner classes.
<b>UNIT 2 Swing Component</b> (Weightage-10, Hrs- 06)	
2a. Differentiate between AWT and Swing . 2b. Use swing components to Develop Graphical user interface (GUI) programs. 2c. Develop Graphical user interface (GUI) programs using advanced swing components.	2.1 Introduction to Swing: Swing features, difference between AWT and Swing. 2.2 Swing Components: JApplet, Icons and JLabels ,JText Fields, JButtons. JCombo Boxes, JCheckboxes, JRadio Buttons. 2.3 Advanced Swing Components: Tabbed Panes, Scroll Panes, Trees, Tables, Progress bars, tool tips.
<b>UNIT 3 Networking Basics</b> (Weightage- 12 , Hrs-06)	
3a. Define socket. 3b. Compare various sockets. 3c. Write a java programs for client server communication using sockets. 3d. Differentiate between TCP/IP and UDP.	3.1 Socket overview, client/server, reserved sockets, proxy servers, Internet addressing. 3.2 InetAddress, Factory methods, instance method TCP/IP Client Sockets. 3.3 What is URL Format? URL connection, TCI/IP Server Sockets. 3.4 Datagrams: Datagram packets Datagram server & client.
<b>Section - II</b>	
<b>UNIT 4 Java Database Connectivity</b> (Weightage- 14 , Hrs- 08)	
4a. Describe the Basics of JDBC 4b. Develop a program for JDBC connectivity. 4c. Develop program to establish connectivity with the specified database.	4.1 Introduction to JDBC, ODBC 4.2 JDBC architecture: Two tier and Three tier models 4.3 Types of JDBC drivers. 4.4 Driver Interfaces and Driver manger Class: Connection Interface and Statement Interface, Prepared statement Interface, Result Set Interface. 4.5 A JDBC Database Example
<b>UNIT 5 Remote Method Invocation</b> (Weightage- 10 , Hrs-06)	
5a. Compare Distributed and Non distributed Java Programs. 5b. Draw RMI Architecture. 5c. Define stubs and skeletons.	5.1 Introduction to Distributed Computing with RMI : Goals, Comparison of Distributed and Non distributed Java Programs 5.2 Java RMI Architecture and Interfaces. 5.3 Naming Remote Objects, Using RMI, Interfaces, Implementation, Stubs and Skeletons, Host Server, Client.

	5.4 Running RMI System, Parameters in RMI, Remote Object Parameters.
<b>UNIT 6 Servlets (Weightage- 14 , Hrs-10)</b>	
6a. Explain Function of the given method of Servlet life cycle. 6b. Use relevant Generic servlet to develop given web based application. 6c. Use relevant HTTP servlet to develop specified web based application. 6d. Develop servlet for cookies and session tracking to implement the given problem.	6.1 The Life cycle of servlet 6.2 Creating simple Servlet: The Servlet API, javax.servlet Package, Servlet Interface, Servlet Config Interface, ServletContext Interface, Servlet Request Interface, Servlet response Interface, Generic Servlet class 6.3 The java. Servlet.httpPackage: HttpServlet Request Interface, Http Servlet Response Interface, Http Session Interface, Cookie class, Http Servlet class, Http Session Event class, Http Session binding Event class. 6.4 Handling HTTP Requests and Responses Handling HTTP GET Request Handling HTTP POST Requests. 6.5 Cookies and session Tracking.

### 8. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Abstract Windowing Toolkit(AWT)	12	06	06	08	20
II	Swing Component	06	02	02	06	10
III	Networking Basics	06	04	02	06	12
IV	Java Database Connectivity (JDBC)	08	04	04	06	14
V	Remote Method Invocation & JAVA Beans	06	04	02	04	10
VI	Servlets	10	04	04	06	14
<b>Total</b>		<b>48</b>	<b>24</b>	<b>20</b>	<b>36</b>	<b>80</b>

### 9. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

- a. Prepare journal based on practical performed in laboratory.
- b. Follow Coding Standards.
- c. Give seminar on relevant topic
- d. Undertake micro-projects.

- e. Develop variety of program to improve logical skills.
- f. Develop Application oriented real world programs.

#### 10. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

- a. Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
- b. About **15-20% of the topics/sub-topics** which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
- c. With respect to item No.8, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
- d. Guide student(s) in undertaking micro-projects.
- e. Correlate subtopics with major topics and concepts.
- f. Use proper equivalent analogy to explain different concepts.
- g. Use Flash/Animations to explain various components and operation.
- h. Teacher should ask the students to go through instruction and Technical manuals.

#### 11. SUGGESTED MICRO-PROJECTS

**MINI PROJECT:** Implement mini project using all the Java concepts studied in the above units.

##### (Only for Class Declaration Courses)

**Only one micro-project** is planned to be undertaken by a student that needs to be assigned to him/her. In the first four semesters, the micro-projects are group-based. However, in the fifth and sixth semesters, it should be preferably be **individually** undertaken to build up the skill and confidence in every student to become problem solver so that she/he contributes to the projects of the industry. In special situations where groups have to be formed for micro-projects, the number of students in the group should **not exceed three**.

The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. Each student will have to maintain dated work diary consisting of individual contribution in the project work and give a seminar presentation of it before submission. The total duration of the micro-project should not be less than **16 (sixteen) student engagement hours** during the course. The student ought to submit micro-project by the end of the semester to develop the industry oriented COs.

A suggestive list of micro-projects is given here. Similar micro-projects could be added by the concerned faculty:

- a. Library Management system
- b. Hospital Management System
- c. Medical Store Stock Management System
- d. Online Railway Reservation System

**12. LEARNING RESOURCES**

<b>Title of Book</b>	<b>Author</b>	<b>Publication</b>
Java2 Programming	Keyur Shah	Tata McGraw hill ISBN :0070435979
Core Java Volume II	Cay S. Horstmann, Pearson	ISBN :9780134177298
Special edition using java1.2	Joseph L.Weber, PHI	ISBN :9780789720184
The Complete Reference Java 2 (Fifth Edition)	Schildt, Herbert	Mcgraw Hill Education, New Delhi ISBN:9789339212094
Java 2 Programming Black Book	Holzner, Steven et al.	Holzner, Steven et al. Dreamtech Press, New Delhi ISBN 10: 817722655X/ ISBN 13: 9788177226553
Java Server Programming Tutorial JAVA EE6 Black Book	Kogent Learning Solutions	Kogent Learning Solutions Dreamtech Press, New Delhi ISBN : 978-81-7722- 937-0

**13. SOFTWARE/LEARNING WEBSITES**

1. <http://www.nptel.ac.in>
2. <https://www.tutorialspoint.com/cprogramming>
3. <https://onlinecourses.nptel.ac.in>

**14.PO - COMPETENCY- CO MAPPING**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO/PO</b> → ↓							
CO1	2	1	1	1	1	1	1
CO2	2	1	1	1	1	1	1
CO3	3	2	3	3	1	1	1
CO4	3	2	3	3	1	1	2
CO5	3	2	3	3	1	1	1
CO6	3	2	3	3	1	2	2

	<u>PSO1</u>	<u>PSO2</u>
<u>CO1</u>	-	3
<u>CO2</u>	-	2
<u>CO3</u>	-	2
<u>CO4</u>	-	2
<u>CO5</u>	-	3
<u>CO6</u>	-	2

Name: 1. H S Pawar 2. R J Chavan (Signature of Coursec Expert / s)	(Mr. U. V. Kokate) Signature of Head of the Department (Computer Engineering)
(Mr. U. V. Kokate) Signature of Programme Head (Computer Engineering)	(Mr. A. S. Zanpure) Signature of CDC In-charge



**Government Polytechnic, Pune**

**'180 OB' – Scheme**

Programme	<b>Diploma in Computer Engineering</b>
Programme code	<b>06/26</b>
Name of Course	<b>Computer Security</b>
Course Code	<b>CM4110</b>
Prerequisite course code and name	<b>Nil</b>
Class Declaration	<b>No</b>

### 1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				
					Theory		Practical		Total Marks
L	T	P	C		ESE	PA	*ESE	PA	150
03	00	02	05	Marks	80	20	25	25	
				Exam Duration	3 Hrs	1 Hr			

(\*):OE- Oral Examination

**Legends:** L- lecture, T-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assessment.

### 2. RATIONALE

In today's Digital Era, due to various threats, designing security in organization is an important consideration. It is essential to understand basic security principles, various threats to security and techniques to address these threats. The student will be able to recognize potential threats to Computer Security and also able to implement various computer security policies. This course will introduce basic cryptographic techniques, fundamentals of computer/network security, Biometrics, Public Key Infrastructure. It focuses on concepts and methods associated with planning managing and auditing security at all levels including networks.

### 3. COMPETENCY

The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

- **Maintain system and network security of organization.**

#### 4. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Know the basics of Computer Security and identify various software threats and attacks on operating system
2. Adopt security measures for security of vital data and identify role of people in security.
3. Apply cryptographic algorithms to maintain Computer Security.
4. Know the procedure to obtain digital certificate and PKI.
5. Apply various Security mechanisms to provide security of network and system.

#### 5. SUGGESTED PRACTICALS/ EXERCISES

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1.	1	Study of IT Act and Cyber Laws	CO1	02
2.	2	Install and configure Antivirus software on system (any).	CO2	02
3.		Practice use of data recovery tools	CO2	04
4.	3	Write a program to implement any Substitution/Transposition Technique.	CO3	04
5.		Install any Cryptographic tool( For. Eg. Cryptool Software)	CO3	02
6.		Perform various Encryption/Decryption techniques using Cryptographic Tool.	CO3	04
7.	4	Install and Configure firewall settings on any operating system	CO4	04
8.		Create and verify Digital Certificate using tool (e.g. Cryptool)	CO4	04
9.	5	Trace the origin of Email using any tool(e.g. emailTrackerPro)	CO5	04
10.		Trace the path of web site using Tracert Utility	CO5	02
		<b>Total Hrs</b>		<b>32</b>

S.No.	Performance Indicators	Weightage in %
a.	Correctness of the flow of procedure.	30
b.	Application of basic security design principle and techniques to address threats.	20
c.	Use of various security tools and utilities.	10
d.	Quality of input and output displayed (messaging and formatting)	10
e.	Answer to sample questions	20
f.	Submit report in time	10

S.No.	Performance Indicators	Weightage in %
	<b>Total</b>	<b>100</b>

## 6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practical, as well as aid to procure equipment by authorities concerned.

Sr.No.	Major Equipment/ Instruments Required	PrO. No.
1	Any Anti-Virus Software	2
2	Cryptographic Tool (For. E.g. Cryptool software)	5,6,7
3	Email Tracing Utility (For eg. Email TrakerPro)	8

## 7. THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency.

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>UNIT 1. Introduction to computer security ( Weightage -16, Hrs-12)</b>	
<b>1a.</b> Explain the importance of given pillars of computer security.  <b>1b.</b> Explain the characteristics of given type of threat.  <b>1c.</b> Explain types of attacks related with security.	<b>1.1 Foundations of Computer Security :</b> Definition and Need of computer security, Security basics: Confidentiality, Integrity, Availability, Accountability, Non-repudiation, Reliability, Authentication. <b>1.2 Risk and Threat Analysis:</b> Assets, Vulnerability, Threats, Risks, Counter measures. <b>1.3 Threat to Security:</b> Viruses, Phases of Viruses, Types of Virus, Dealing with Viruses, Worms, Trojan horse, Intruders, Insiders, Ransomware. <b>1.4 Type of attacks:</b> Active and Passive attacks, Denial of service, DDOS, backdoors and trapdoors, sniffing, phishing, spoofing, man in the middle, replay, TCP/IP Hacking, encryption attacks. Steps in Attacks.
<b>UNIT 2. User Authentication &amp; Access Control (Weightage-14, Hrs-08)</b>	

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<p><b>2a.</b> Explain how to construct good/strong password)</p> <p><b>2b.</b> Explain the given method of Biometric.</p> <p><b>2c.</b> Explain Authentication and Authorization with example.</p> <p><b>2d.</b> Describe the features of given access control policy.</p>	<p><b>2.1 Identification and Authentication:</b> User name &amp; Password, Guessing password, Password attacks-Piggybacking, Shoulder surfing, Dumpster diving</p> <p><b>2.2 Biometrics:</b> finger prints, hand prints, Retina, patterns, voice patterns, signature and writing patterns, keystrokes.</p> <p><b>2.3 Access controls:</b> Definition, Authentication Mechanism, principle Authentication, Authorization, Audit, Policies: DAC, MAC, RBAC</p> <p><b>2.4 Social Engineering.</b></p>
<b>UNIT 3. Cryptography ( Weightage- 20 , Hrs- 12)</b>	
<p><b>3a.</b> Define terms related to cryptography.</p> <p><b>3b.</b> Encrypt/Decrypt the given text using different substitution/transposition techniques.</p> <p><b>3c.</b> Describe various encryption algorithms</p> <p><b>3d.</b> Explain Hashing with properties.</p>	<p><b>3.1 Introduction:</b> Plain Text and Cipher Text, Cryptography, Cryptanalysis, Cryptology, Encryption, Decryption.</p> <p><b>3.2 Substitution techniques:</b> Caesar’s cipher, mono alphabetic, poly alphabetic, Vigenere cipher</p> <p><b>3.3 Transposition techniques:</b> Rail fence technique, simple columnar, Vernam Cipher (One-Time Pad)</p> <p><b>3.4 Steganography;</b> Procedure, Hashing: Definition , Hashing Algorithms: MD-5, SHA</p> <p><b>3.5 Symmetric and Asymmetric cryptography:</b> Introduction to Symmetric encryption, DES (Data encryption Standard) algorithm, Asymmetric key cryptography: Digital Signature</p>
<b>UNIT 4. Public Key Infrastructure (Weightage-14 , Hrs- 08)</b>	
<p><b>4a.</b> Explain working of PKI.</p> <p><b>4b.</b> Describe Public Key Infrastructure</p> <p><b>4c.</b> Describe steps for obtaining digital certificate</p> <p><b>4d.</b> Explain digital certificate life cycle</p>	<p><b>4.1 Public key infrastructures:</b> basics, digital certificates, certificate authorities, registration authorities</p> <p><b>4.2 Steps for obtaining a digital certificate</b></p> <p><b>4.3 Trust and certificate verification</b></p> <p><b>4.4 Digital certificates:</b> certificate attributes, certificate extensions</p> <p><b>4.5 Certificate life cycles:</b> registration &amp; generations, renewal, revocation, CRL distribution, suspension, key destruction</p> <p><b>4.6 Centralized and decentralized infrastructure</b></p>

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>UNIT 5. System Security &amp; Network Security (Weightage-16 , Hrs-08)</b>	
<b>5a.</b> Explain need of firewalls.  <b>5b.</b> Explain Intrusion Detection system.  <b>5c.</b> Classify IDS techniques.  <b>5d.</b> Explain different ways to implement IP Security  <b>5e.</b> Explain protocols related to Email security	<b>5.1 Firewall :</b> Need of firewall, types of firewall- packet filters, application gateways, circuit gateways <b>5.2 Kerberos.</b> <b>5.3 Intrusion Detection:</b> Network-Based IDS, Host-Based IDS <b>5.4 Honeypots.</b> <b>5.6 Operating system security:</b> Operating system updates : hot fix, patch, service pack <b>5.7 IP security:</b> overview, Protocols- AH, ESP, Modes- transport & Tunnel <b>5.8 Email security:</b> SMTP, PEM, and PGP.

## 8. SUGGESTED SPECIFICATION TABLE FORQUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction to computer security	12	06	06	04	16
II	User Authentication & Access Control	08	04	06	04	14
III	Cryptography	12	04	08	08	20
IV	Public key infrastructure	08	04	06	04	14
V	Network Security and System Security	08	04	06	06	16
<b>Total</b>		48	<b>22</b>	<b>32</b>	<b>26</b>	<b>80</b>

## 9. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course:

- a. Prepare journal of practicals.
- b. Use Cryptographic Tools and Utilities.

**10. SUGGESTED LEARNING RESOURCES**

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Principles of computer security Security+and Beyond	Wm.Arthur Conklin Dwayne Williams Gregory B. White Roger L.Davis Chuck Cothren,	McGraw Hill Technology Education International Edition2005 ISBN-13: 978-0072255096 ISBN-10: 0072255099
2	Cryptography And Network Security	Behrouz A Forouzan, De Anza College, Deepak Mukopadhyay	McGraw Hill Technology Education International 2nd Edition
3	Computer Security Third Edition	Dieter Gollmann	Wiley Publication ISBN : 978-0-470-74115-3
4	Cryptography and Network Security Third Edition	Atul Kahate	McGraw Hill Education, New Delhi ISBN 13: 978-1-25-902988-2

**11. SOFTWARE/LEARNING WEBSITES**

- [https://www.tutorialspoint.com//computer\\_security/computer\\_security\\_quick\\_guide.htm](https://www.tutorialspoint.com//computer_security/computer_security_quick_guide.htm)
- <https://freevideolectures.com/course/3027/cryptography-and-network-security>
- [https://www.tutorialspoint.com/ethical\\_hacking/ethical\\_hacking\\_process.htm](https://www.tutorialspoint.com/ethical_hacking/ethical_hacking_process.htm)
- <https://www.cybrary.it/>
- <https://www.tutorialspoint.com/cryptography/index.htm>
- <https://www.geeksforgeeks.org/ip-security-ipsec/>
- <https://www.open.edu/openlearn/ocw/mod/oucontent/view.php?id=48325&section=1>

**12. PO - COMPETENCY- CO MAPPING**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	–	–	–	3	–	2
CO2	2	3	2	–	3	1	3
CO3	3	3	3	3	3	3	2
CO4	2	1	2	2	3	1	2
CO5	2	3	3	1	2	2	2

	PSO1	PSO2
CO1	–	1
CO2	1	2
CO3	–	3
CO4	1	2
CO5	3	3

Sign: Name: Smt. S.P. Ambavane/ Smt. K. S. Sathawane (Course Expert /s)	Sign: Name: Shri.U. V. Kokate (Head of Department) (Department of Computer Engineering)
Sign: Name: Shri.U. V. Kokate (Programme Head) (Department of Computer Engineering)	Sign: Name: Shri A.S.Zanpure (CDC )

# Government Polytechnic, Pune

## '180 OB' – Scheme

Programme	Diploma in ET/CE/EE//ME/MT/CM/IT/DDGM
Programme code	01/02/03/04/05/06/07/08/16/17/21/22/23/24/26
Name of Course	Relational Database Management System
Course Code	CM4111
Prerequisite course code and name	-
Class Declaration	No

### 1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				
L	T	P			C	Theory		Practical	
L	T	P	C	Marks	ESE	PA	*ESE	PA	Total Marks
04	00	02	06	80	20	25	25	150	
				Exam Duration	3 Hrs	1 Hr	-		

(\*): POE(Practical & Oral Examination)

*Legends: L- lecture, T-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assesment.*

### 2. RATIONALE

The major objectives of this course are to provide a strong formal foundation in Database Concepts, technology and practice to the students to enhance them into well informed application developers. After learning this subject, the students will be able to understand the designing of RDBMS and can use any RDBMS package as a backend for developing database applications.

### 3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

- Apply database management concepts using SQL and PLSQL.



#### 4. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Design database schema.
2. Normalize given database.
3. Draw an Entity Relationship diagram.
4. Create and process database for a given case study using relational database management engine.
5. Create index, sequence, and views in SQL for tuning the performance in case of data retrieval.
6. Write and execute PL/SQL procedures using triggers, cursors.

#### 5. SUGGESTED PRACTICALS/ EXERCISES

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1.	2	Create and update relation using DDL, DML, DCL and TCL commands.	4	2
2.	2	Applying Constraints on relation.	4	2
3.	2	Draw an ER diagram for given database.	2	4
4.	3	Write Queries using various types of operators like (Set, Relational, Arithmetic and Logical)	4	2
5.	3	Write Queries using various Functions like (Date, Time, String, and Aggregate).	4	2
6.	3	Write Queries using different types of clauses.	4	2
7.	3	Write Queries using different types of Joins.	4	2
8.	4	Create, update and alter View, Sequence and Index.	5	2
9.	3	Design and Develop MongoDB queries using basic operations.	4	2
10.	5	Write the PL/SQL Program using different Control structures.	6	2
11.	5	Programs based on Exceptions handling.(Predefined and user defined exceptions)	6	2
12.	5	Write a program to implement cursors.	6	2
13.	6	Write program to implement stored Procedure and Functions.	6	2
14.	6	Write program for creating Various types Triggers.	6	2
15.	6	Creating and deleting users and assign privileges to users.	4	2
		<b>Total Hrs</b>		<b>32</b>

S.No.	Performance Indicators	Weightage in %
a.	Installation and configuration of database system	10
b.	Coding of queries	40
c.	Quality of result displayed by queries.	30
d.	Answer to sample questions	10
e.	Submit assignment in time	10
<b>Total</b>		100

## 6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practical, as well as aid to procure equipment by authorities concerned.

Sr.No.	Major Equipment/ Instruments Required	PrO. No.
1	Computer system (Any computer system with basic configuration)	All
2	Any RDBMS software (MySQL/Oracle/SQL server/MongoDB or any other) All	All

## 7. THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency.

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>UNIT 1. INTRODUCTION TO DATABASE SYSTEM (Weightage-12 , Hrs- 08)</b>	
1a. State importance of database management system. 1b. Define data, database, DBMS, data independence, data abstraction, and schema. 1c. State Codd's laws. 1d. Describe Overall structure of DBMS. 1e. Describe architecture of DBMS. 1f. Distinguish Hierarchical, networking and relational data model. 1g. Describe data mining, data warehousing, big data and	1.1 Database concepts: Data, Database, Database management system, File system verses DBMS, Applications of DBMS, Data Abstraction, Data Independence, Database Schema, The Codd's rules, Overall structure of DBMS 1.2 Architecture: Two tier and Three tier architecture of DBMS. 1.3 Data Models: Hierarchical, Networking, Relational Data Models. 1.4 Advanced database concepts: Data mining, Data Warehousing, Introduction to Big data and Mongo DB.

Mongo DB.	
<b>UNIT 2 RELATIONAL DATA MODEL (Weightage- 14 , Hrs- 10)</b>	
<p>2a. Define table, row, column, domain, attribute, key, strong entity set and weak entity set.</p> <p>2b. State types of keys and give example of each.</p> <p>2c. Describe data constraints.</p> <p>2d. Describe database design in terms of 1NF, 2NF and 3NF.</p> <p>2e. Describe conceptual design.</p> <p>2f. Draw an ER diagrams.</p>	<p>2.1 Relational Structure- Tables (Relations), Rows(Tuples), Domains, attributes</p> <p>2.2 Keys: Super Keys, Candidate Key, Primary Key, Foreign Key.</p> <p>2.3 Data Constraints: Not Null, Unique, Primary Key, Foreign Key, Check, Default.</p> <p>2.4 Normalization -Normalization based on functional dependencies, Normal forms: 1NF, 2NF, 3NF.</p> <p>2.5 Entity Relationship Model,-Strong Entity set, Weak Entity set, Types of Attributes, E-R Diagrams.</p>
<b>UNIT 3 SQL AND NoSQL (Weightage- 14 , Hrs- 12)</b>	
<p>3a. Enlist oracle data types.</p> <p>3b. Compare DDL, DML, DCL and TCL.</p> <p>3c. Write SQL queries on DDL, DML, DCL and TCL.</p> <p>3d. Describe clauses and Joins with its types.</p> <p>3e. Write SQL queries to evaluate use of clauses and joins.</p> <p>3f. Enlist operators and compare between Relational, Arithmetic, Logical, set operators.</p> <p>3g. Write SQL queries to evaluate use of operators.</p> <p>3h. Enlist functions and compare Date, time, String functions and Aggregate Functions.</p> <p>3i. Write SQL queries to evaluate use of functions.</p> <p>3j. Compare SQL with NoSQL</p> <p>3k. Enlist Benefits of NoSQL</p>	<p>3.1 SQL: Invoking SQL*PLUS, The Oracle Data-types ,Data Definition Language (DDL), Data Manipulation language (DML), data control language (DCL), Transaction control language (TCL).</p> <p>3.2 Clauses &amp; Join: Different types of clauses in SQL. Joins, Types of Joins, Nested queries.</p> <p>3.3 Operators: Relational, Arithmetic, Logical, set operators.</p> <p>3.4 Functions: Date and time, String functions, Aggregate Functions.</p> <p>3.5 Introduction to NoSQL- Structured versus Unstructured Data, NoSQL database concepts-Types of NoSQL databases, NoSQL data modeling, Benefits of NoSQL, comparison between SQL and NoSQL database system.</p>

<b>UNIT 4 SQL PERFORMANCE TUNING (Weightage- 10 , Hrs- 08)</b>	
<p>4a. Define view, sequence and index.</p> <p>4b. Describe view with its types.</p> <p>4c. Write SQL queries to create view and perform different operations on it.</p> <p>4d. Write SQL queries to create sequence and perform different operations on it.</p> <p>4e. Describe types of indexes.</p> <p>4f. Write SQL queries to create index and perform different operations on it.</p>	<p>4.1 Creating Views, Views: Types of Views: Read Only View and Updatable Views, Dropping Views.</p> <p>4.2 Sequences: Creating Sequences, Altering Sequences, Dropping Sequences</p> <p>4.3 Indexes: Index Types, Creating of an Index: Simple Unique, and Composite Index, Dropping Indexes.</p>
<b>UNIT 5 PL/SQL (Weightage- 14 , Hrs- 12)</b>	
<p>5a. Define Exception and Cursors.</p> <p>5b. Enlist PL/SQL data types.</p> <p>5c. State advantages of PL/SQL.</p> <p>5d. Describe control structure with its types.</p> <p>5e. Write PL/SQL block to evaluate use of different control structures.</p> <p>5f. Describe exception handling with its types.</p> <p>5g. Write PL/SQL block to create different types of Exception.</p> <p>5h. Describe working of cursors.</p> <p>5i. Distinguish between Implicit and Explicit cursors.</p> <p>5j. Write PL/SQL block to create different types of cursors.</p>	<p>5.1 Introduction of PL/SQL: The PL/SQL Syntax, The PL/SQL Block Structure, PL/SQL data types, Advantages of PLSQL.</p> <p>5.2 Control Structure: Conditional Control, Iterative Control, Sequential Control.</p> <p>5.3 Exception handling: Predefined Exception, User defined Exception.</p> <p>5.4 Cursors: Implicit and Explicit Cursors</p>
<b>UNIT 6 PL/SQL DATABASE OBJECTS AND DATABASE ADMINISTRATION OVERVIEW (Weightage- 16 , Hrs- 14)</b>	
<p>6a. Define Procedure, Function and Trigger.</p> <p>6b. State advantages of procedure.</p> <p>6c. Describe working of stored procedure.</p> <p>6d. Write PL/SQL block to create stored procedures.</p> <p>6e. Describe working of triggers.</p> <p>6f. Write PL/SQL block to create different types of triggers.</p> <p>6g. Describe roles and responsibilities of database</p>	<p>6.1 Procedures: Advantages, Creating, Executing and Deleting a Stored Procedure</p> <p>6.2 Functions: Advantages, Creating, Executing and Deleting a Function.</p> <p>6.3 Database Triggers: Use of Database Triggers, Types of Triggers, Syntax for Creating Trigger, Deleting Trigger.</p> <p>6.4 Introduction to database administration: Types of database users, Creating and deleting users, Assigning privileges to users</p> <p>6.5 Database Backup-Types of failure, Causes of failure and database backup.</p>

administrator. 6h. Describe procedure to take database backup.	
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## 8. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction to Database system	08	06	06	00	12
II	Relational Data Model	10	04	04	06	14
III	SQL and NoSQL	12	04	04	06	14
IV	SQL Performance Tuning	08	02	04	04	10
V	PL/SQL	12	04	04	06	14
VI	PL/SQL Database Objects and Database administration Overview	14	04	06	06	16
<b>Total</b>		64	24	28	28	80

## 9. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

- a. Prepare journals based on practicals performed in laboratory.

## 10. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

- a. Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
- b. About *15-20% of the topics/sub-topics* which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the Cos through classroom presentations (see implementation guideline for details).
- c. With respect to item No.8, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
- d. Guide student(s) in undertaking micro-projects.
- e. Correlate subtopics with power plant system and equipments.
- f. Use proper equivalent analogy to explain different concepts.
- g. Use Flash/Animations to explain various components, operation and
- h. Teacher should ask the students to go through instruction and Technical manuals

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## 11. SUGGESTED MICRO-PROJECTS (Only for Class Declaration Courses)

*Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her. In the first four semesters, the micro-project are group-based. However, in the fifth and sixth semesters, it should be preferably be **individually** undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. In special situations where groups have to be formed for micro-projects, the number of students in the group should **not exceed three**.*

*The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. Each micro-project should encompass two or more Cos which are in fact, an integration of PrOs, Uos and ADOs. Each student will have to maintain dated work diary consisting of individual contribution in the project work and give a seminar presentation of it before submission. The total duration of the micro-project should not be less than **16 (sixteen) student engagement hours** during the course. The student ought to submit micro-project by the end of the semester to develop the industry oriented Cos.*

*A suggestive list of micro-projects is given here. Similar micro-projects could be added by the concerned faculty:*

- a) *Design and develop database for library management system.*
- b) *Design and develop database for Hospital management system.*
- c) *Any other micro projects suggested by subject faculty on similar line.*

## 12. SUGGESTED LEARNING RESOURCES

S.N .	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Introduction to Database system	Abraham Silberschitz, Henry Korth and S.Sudharshan, Tata McGraw Hill , 3 <sup>rd</sup> edition ,	13-978-93-3290-138-4
2	SQL, PLSQL	Ivan Bayross, BPB Publication, 3 <sup>rd</sup> edition	10:81-7656-964-X
3	Database Management Systems Application	Kogent Learning Solutions Inc., Dreamtech Press 2014	ISBN-978-93-5119-476-7

## 13. SOFTWARE/LEARNING WEBSITES

1. <https://nptel.ac.in/courses/106105175/>,
2. <https://www.w3schools.com/sql> ,
3. <https://www.tutorialspoint.com/sql>,
4. <https://www.studytonight.com/dbms>,
5. <https://docs.mongodb.com/manual/tutorial/install-mongodb-on-windows/>

## 14. PO – COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	3	3	1	3	3	3
CO2	3	3	2	2	3	3	3
CO3	2	3	3	3	3	3	3
CO4	2	1	3	3	2	3	3
CO5	2	1	2	3	2	3	3
CO6	2	1	2	3	2	3	3

	PSO1	PSO2
CO1	-	3
CO2	-	3
CO3	-	3
CO4	-	3
CO5	-	3
CO6	-	3

<p>Sign:</p> <p>Name: 1.Smt.S.B.Gosavi 2.Smt.R.J.Chavan</p> <p>(Course Expert /s)</p>	<p>Sign:</p> <p>Name: Mr. U.V.Kokate</p> <p>(Head of Department)</p>
<p>Sign:</p> <p>Name: Mr. U.V.Kokate</p> <p>(Program Head ) (Computer Dept.)</p>	<p>Sign:</p> <p>Name: Shri A.S.Zanpure</p> <p>(CDC )</p>