Government Polytechnic, Pune
(An Autonomous Institute of Government of Maharashtra)

Department of Computer Engineering

Level IV - C Curriculum

Programme Specific Courses

Government Polytechnic, Pune

'180 OB' – Scheme

Programme	**Diploma in Information Technology /Diploma in Computer Engineering**
Programme code	01/02/03/04/05/**06/07**/08/21/22/23/24/26/15/16/17/18/19/ **26**
Name of Course	**INDUSTRY INPLANT TRAINING**
Course Code	**CM4101**
Prerequisite course code and name	**Concerned Level 1 & Level 2 courses Term grant**
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	100
00	00	06	06	Marks	-	-	50	50	
				Internship Duration	6 weeks duration				

Legends: L- Lecture, P- Practical, T- Tutorial, C- Credit, ESE-End Semester Examination, PA- Progressive Assessment (Test I, II/Term Work), *- Practical Exam, $- Oral Exam, #- Online Examination each Lecture/Practical period is of one clock hour;

2. RATIONALE:

Employability competencies can be enhanced by exposing students to the actual real time working environment in industry. The industrial skills like, soft skills, life skills and hands-on will be inculcated among the students. Inplant training is the only way students learn application of acquired knowledge to fulfill market demand and develop skills and competencies required to become employable.

3. COMPETENCY:

Following competencies are expected to be developed through INDUSTRY INPLANT TRAINNG :

a) Soft Skills : Communication, Presentation, Technical Report Writing.
b) Life Skills : Time management, Safety, Innovation, Entrepreneurship, Team building etc..
c) Hands-on Practices: Implementation of production process and development of software and Quality Assurance aspects.

4. COURSE OUTCOMES:

Industry Inplant training is intended to acquire the competencies as mentioned above to supplement those attained through several courses up to fourth semester of the program:

CO1: Communicate effectively (verbal as well as written) to execute the work.
CO2: Prepare the report of the executed work at the industry.
CO3: Exercise time management and safety in the work environment.
CO4: Work in teams for successful completion of projects assuring quality.

5. GENERAL GUIDELINES FOR INDUSTRIAL TRAINING

a) **Period of Industrial Training:** Between 4^{th} and 5^{th} semester (Summer Vacation).
b) **Duration of the training:** Six weeks
c) The Industries/Organizations can be Government/Public limited/or Private family enterprises.

- **Training Area:** Students should be placed in large and medium scale Industry / Organization. However, despite the best efforts by the institute, if large and medium scale Industry / Organization are not available to all students then, students can also be placed in small scale Industry / Organization.

For **Civil engineering** it can be public works department, irrigation department, public health engineering, municipal corporations, town and country planning, highway and roads authorities, railways, large and medium scale civil contractors, rural engineering departments, environment corporations, large and medium scale private construction companies, mining companies etc.

For **Mechanical Engineering** it can be manufacturing, fabrication, foundry or processing industry which may include compressors, boilers, engines, heat exchangers, air conditioning and refrigeration plants, conveyors, automation etc are either manufactured or used. Power plants, Railways, process plants, ordinance factories, textile factories, automobile manufacturers or major automobile workshops

For **Electrical Engineering** it can be electricity transmission and distribution companies, power generating stations, sub stations, railways, industries manufacturing electrical products which may include industry where large motors/transformers etc. are used, process plants, electrical contractors.

For **Electronic Engineering** it can be telecommunication companies, post and telegraph department, manufacturer of telecommunication product, manufacturers of control equipments, manufacturer of CNC machines, any manufacturing industry where electronic controls are used either in production process or in its products, computer hardware manufacturers, signal divisions of railways, etc.

For **Computer and IT Engineering** it can be any software developers, cyber security companies, web page developers, networking companies, data base management companies, telecommunication companies or IT division of any other industries/finance/retail companies or organizations where software are used and maintained for various applications.

For **Metallurgical Engineering** it can be manufacturing industry such as fabrication , foundry , processing industry, forging, galvanizing, Iron making and steel making industries.

For **Dress Designing and Garment Manufacturing** it can be Textile industries, Weaving and

Knitting industries, Garments industries, Design and Styling fashion garments , Retail malls.

6. ROLE OF PARENT DEPARTMENT & THE INSTITUTE:

A. Formation of Placement cell for IIP at institute level: (one time activity)

It will be consisting of Training& Placement Officer (TPO), CDC Incharge , and one Faculty from each program .

Activities to be carried by Institute IIP Cell:

A.1 Collecting information about Industry / Orginisation available for training along With the capacity.

A.2 Communication with Industry / Orginisation available for training along with capacity and its confirmation.

A.3 Issue letter to the Industry / Orginisation for the training along with details of students and mentors.

B. Formation of IIP Cell At program level: (one time activity)

It will be consisting of A faculty from Institute IIP cell , One faculty per division.

for examiners coordination ,orientation +mentors ,letters initialization,

Activities to be carried by Program level IIP Cell:

B.1 Student and mentor allocation as per the slots available for in-plant Training.

B.2 Obtaining consent letter from parents / guardian.(Undertaking on Rs100 stamp, Insurance)

B.3 Orientation and selection of Students in before start of Industry inplant training through counseling.

B.4 Mentors to carry out progressive assessment of the students during the in-plant training.

B.5 End of training assessment by mentor along with Industry / Organization expert as external

- **Scheduling for Implant Training placements –**

Sr. no	activity	Period	Responsibility
1	Industries to be identified	6^{th}-8^{th} week of 4^{th} Semester.	Departmental inplant training coordinator
2	Communication and coordination with industry	8^{th}-10^{th} week of 4^{th} Semester	Departmental inplant training coordinator
3	Allocation of faculty /	8^{th}-10^{th} week of 4^{th}	Departmental inplant

	Mentor	Semester	training coordinator
4	Acquire undertaking from students and parents .	10^{th} – 12^{th} week of 4^{th} Semester	Allocated faculty / Mentor
5	Finalise and prepare letter of placements	12^{th} – 16^{th} week of 4^{th} Semester	Allocated faculty / Mentor
6	Organise orientation and guidance and counseling Session for respective students	12^{th} – 16^{th} week of 4^{th} Semester	Allocated faculty / Mentor
7	Progressive assessment of the students during the in-plant training	Each week of training	Allocated faculty / Mentor
8	End of training assessment by mentor along with Industry / Organization expert	Before 5^{th} semester ESE	Allocated faculty / Mentor

- Faculty will be visiting the industry **at least once** during training phase after third week for assessment in coordination with industry personnel and for taking feedback. Weekly assessment can be done through online mode .

7. FORMAT FOR TRAINING REPORT

Following is the suggestive format for the training report, actual format may differ slightly depending upon the nature of Industry / Organisation. The training report may contain the following

- Title page
- Certificate
- Abstract
- Acknowledgement
- Content Page

Chapter 1. Organizational structure of Industry / Organisation and General Lay Out

Chapter 2. Introduction of Industry / Organisation (Type of products and services, history, turn over and number of employees etc.)

Chapter 3. Types of major equipment/instruments/machines/hardware and software used in industry with their specification, approximate cost and specific use and their routine maintenance.

Chapter 4. Manufacturing Processes/Models along with planning , handling and control methods.

Chapter 5. Testing of Hardware/Software/raw materials, components and finished products along with quality assurance procedures.

Chapter 6. Safety procedures followed and safety gear used (includes Preventive maintenance schedule and breakdown maintenance procedures).

Chapter 7. Particulars of Practical Experiences in Industry / Organisation if any in Production/ Assembly/ Testing/Maintenance.
Chapter 8. Detailed report of the Task . (if any done during the training)
Chapter 9. Special/challenging experiences encountered during training if any (may include students liking & disliking of work places)
Chapter 10. Conclusion
Chapter 11. References /Bibliography

8. SUGGESTED LEARNING & EVALUATION STRATEGIES/GUIDELINES

- Students should visit the website of the industry where they are undergoing training to collect information about products, processes, capacity, number of employees, turnover etc.
- They should also refer the handbooks of the major machinery, softwares and operation, testing, quality control and testing manuals used in the industry.
- Students may also visit websites related to other industries wherein similar products are being manufactured as their learning resource.
- Both the industry supervisor and the faculty supervisor are responsible to assess the students' performance and soft-skills.
- To assess the students, the scoring rubric, scoring schemes and rating scales are developed. The components to be assessed are :

- Industrial training Report,
- Logbook(Diary),
- Industrial training Oral Presentation,
- Student Performance Evaluation by Organization Supervisor, and
- Student Performance Evaluation by Faculty Supervisor

- Industrial Training report writing require students to produce a substantial report to explain about the organization's background, the overall training that have been performed and the specific projects that they have conducted along with specific conclusions /solutions.
- The students must apply the skills of communicating using written language, outlining, organizing, and planning a report, as well as using reference materials and sources and follow the above format.
- The student plays important role in deciding what should be included in the log book and learn to understand and evaluate her own progress.
- In exceptional case, on line training can also be considered as an option, provided, the contents and the assessment schemes are approved from the concerned authorities.
- Student performance evaluation focuses on a student's work performance and the personality. The scoring rubric forms are used that relates assessment item to the learning outcome. The work performance is the ability to complete the given tasks within the specified time frame independently using their knowledge and skills with good quality of work. The soft skills include the socialization, communication, initiative and motivation, discipline, cooperation and teamwork

9. TENTATIVE WEEK-WISE SCHEDULE OF INDUSTRIAL TRAINING

Industrial training is a common course to all programs; therefore the industry / Organisation selection will depend upon the nature of programme and its related industry. The training activity may vary according to nature and size of Industry / Organisation. The following table details suggestive schedule for industrial training for all programs.

Table 1: Guidelines for generalized week schedule and PA Marks distribution

S. No.	Week No.	Details of activities to be completed during Industrial training	Marks distribution/ week for PA
1	Week No. 1	Induction to industry and its departments or study of assigned job.	04
2	Week No. 2	Study of layout and specifications of major machines, equipment and raw materials / components / software and models used.	04
3	Week No. 3	Execute/study Task. **(Execution may start from first week as per job assigned and nature of industry)**	04
4	Week No. 4	Study of QA/QC/Testing procedures.	04
5	Week No. 5	safety and maintenance procedure in an industry/organization .	04
		Total	**20**
6b	Week No. 6	Report Writing (PA marks to be given by faculty based on report writing)	**10**
PA marks to be given by industry supervisor based on student involvement and quality of job performed or job assigned.			**20**
		Total PA marks for training	**50**

10. PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO/PO	Basic and Discipline Specific	Problem Analysis	Design/Development of	Engineering Tools, Experimentations and	Engineering Practices for Society ,Sustainability and	Project Management	Life Long Learning
Communicate effectively (verbal as well as written) to execute the work.	1	-	-	1	1	1	2
Prepare the report of the executed work at the industry.	1	1	-	-	1	1	3
Exercise time management and safety in the work environment.	1	1	1	1	3	2	3
Work in teams for successful completion of projects assuring quality.	-	-	-	-	2	3	3
Summary	**1**	**1**	**1**	**1**	**2**	**2**	**3**

PSO - COMPETENCY- CO MAPPING

CO /PSO	PSO1	PSO2
CO1	1	1
CO2	-	-
CO3	1	-
CO4	2	3

Table 2: Suggested Rubric for PA Assessment of Internships/Implant Training

Note: Allot the marks in the appropriate cell given based on Presentations Done

Week No	Task to be assessed	Outcome Achievement – Poor	Outcome Achievement- Moderate	Outcome Achievement – High		Total week wise Marks
		Poor (Marks 1)	Average (Marks 2)	Good (Marks 3)	Excellent (Marks 4)	
Week 1 : Industry Induction	Induction to industry and its departments or study of assigned job.	Minimal knowledge of departments, processes, products & work culture of the company	Moderate knowledge of departments, processes, products & work culture of the company	Good knowledge of all departments, processes, products & work culture of the company	Extensive knowledge of all departments, processes, products & work culture of the company	
Week 2 : Study of Existing Systems	Study of layout and specifications of major machines, equipment and raw materials / components / software and models used.	Minimal Explanation of existing systems & Objectives of the proposed work are not identified	Moderate Explanation of existing systems & Objectives of the proposed work are not well defined	Good Explanation of existing systems & Some objectives of the proposed work are well defined	Detailed Explanation of existing systems & All objectives of the proposed work are well defined	

Week No. 3: Execution of task	Execute/study Task. **(Execution may start from first week as per job assigned and nature of industry)**	Minimal efforts and participation and poor understanding	Moderate efforts and participation and preliminary understanding	Good efforts and participation and fair understanding	Extensive efforts and participation and well understanding	
Week 4 : Testing Procedures	Study of QA/QC/Testing procedures.	Applications are not appropriate	Applications are Appropriate but not well delivered	Applications are appropriate and well delivered Student cannot apply his/her knowledge on top of assessing what he/she knows	Applications are appropriate and well delivered Student can apply his/her knowledge on top of assessing what he/she knows.	
Week 5 : Study Safety & Maintenance Procedure	Study safety and maintenance procedure in an industry/organization .	Not very appropriate	Appropriate but not well delivered	Appropriate and well delivered Student cannot apply his/her knowledge on top of assessing what he/she knows	Appropriate and well delivered Student can apply his/her knowledge on top of assessing what he/she knows.	

Week No	Task to be assessed	Outcome Achievement – Poor	Outcome Achievement- Moderate	Outcome Achievement – High	Week No	Task to be assessed
		Poor (Marks 5)	Average (Marks 6)	Good (Marks 8)	Excellent (Marks 10)	
Week 6 : Report Writing	Description of concepts and technical details Conclusions and Discussion	Results are not presented properly Project work is not summarized and concluded Future extensions in the project are not specified	Results are presented in good manner Project work is not well summarized and concluded Future extensions in the project are not properly specified	Results are presented in good manner Project work is well summarized and concluded Future extensions in the project are not properly specified	Results are presented in very appropriate manner Project work is well summarized and concluded Future extensions in the project are well specified.	
Total Marks Out of 60						
Marks mapped to 50						

Table 2.1 -PA of Industrial training

Academic year : 20 -20

Name of the industry:

Sr. No.	Enrolment Number	Name of student	Marks from above Rubrics(Mapped to 4 marks for each week)						PA Marks by Industry Supervisor	PA based on Report by mentor faculty (Week 6)	Total
			Week 1	Week 2	Week 3	Week 4	Week 5	Total out of 20 (A)	Out of 20 (B)	Out of 10 (C)	Out of 50 (A)+(B)+(C)

Marks for PA are to be awarded out of 4 for each week considering the level of completeness of activity observed, from the daily diary maintained and feedback from industry supervisor.

Signature of mentor

Name of mentor:

Table 3 Assessment Scheme ESE

	Contents(30 marks)					Presentation(20 marks)					Total Out of (50)
Enrollment No.	Title of Industrial project	Topic Selection (5)	Presentation skill (10)	Overall understanding capability (5)	Knowledge (Q & A) (10)	Speech Clarity (5)	Body Language (3)	Neat Dressing (2)	Slides (05)	Report Writing(5)	Total Out of (50)

Suggested structure for industry Inplant training	
Mrs. M. U. Kokate, Head of Department of Information Technology, G.P.Pune	Shri A.S.Zanpure CDC Incharge
Dr.V.K.Jadhav, Lecturer, Electrical Engineering.,GPP.	Smt.P.M.Zilpe Lecturer, E&TC Engineering.,G. P. Pune

Government Polytechnic, Pune

'180 OB' – Scheme

Programme	**Diploma in Information Technology Diploma in Computer Engineering**
Programme Code	**01/02/03/04/05/06/07/08/16/17/21/22/23/24/26**
Name of the Course	**Project**
Course Code	**CM4102**
Prerequisite Course Code and Name	**90 credits & Level - 1 passed**
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**	100
00	00	04	04	**Marks**	**NA**	**NA**	**50**	**50**	

Legends: L- Lecture, P- Practical, T- Tutorial, C- Credit, ESE-End Semester Examination, PA- Progressive Assessment (Test I, II/Term Work), *- Practical Exam, $- Oral Exam, #- Online Examination each Lecture/Practical period is of one clock hour;

2. RATIONALE

This course tends to mould students towards integrating the knowledge acquired throughout and applying it to the real-life projects, in order to gain the confidence of acquiring Engineering skills and thus fulfil the objective of Diploma Programme. Projects mainly serve the purpose of developing learning-to-learn skills.

3. COMPETENCY

The course should be taught and implemented with the aim to develop the required course outcomes (COs) so that students will acquire following competency needed by the industry:

- **The discipline of planning, organizing, and managing resources to bring about the successful completion of a specific project.**

4. COURSE OUTCOMES (COs)

After undergoing this course, the student will demonstrate the following Course Outcomes:

1. Analyze and define the real-life problem from Project development point of view.
2. Apply appropriate design methodology to the Projects.
3. Make use of designing tools.
4. Conduct feasibility study and cost estimation
5. Create test and debug working model.
6. Compile and Write a Project Report
7. Communicate effectively and confidently as a member /and leader of team.

5. GUIDELINES FOR UNDERTAKING A PROJECT:

I. During the guidance and supervision of the project work, faculty should ensure that students acquire following ***learning outcomes*** (depending upon the nature of the project work some of these learning outcomes may not be applicable):

a) Identify the problems in the area related to their programme based on the competencies acquired since inception into the programme.
b) Identifytheinformationsuggestingthecauseoftheproblemandpossiblesolutions.
c) Assessthefeasibilityofdifferentsolutionsandthefinancialimplications: ,
d) Collect relevant data from different sources (books/internet/market/suppliers/experts etc. through surveys/interviews).
e) Prepare required drawings and detailed plan for execution of the work.
f) Prepare seminar presentations to present findings/features of the project.

II. In case of Industry sponsored/guided project, implementation stages may vary as per industry requirements but same format of project report, diary, demonstration and RUBRICs will be required to be fulfilled.

Sr. No.	General Guidelines
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	Project has to be done in a group of 3-4 students under the guidance of allotted faculty
3	Faculty may Form a team of students as per industry roles- Requirement Gathering, Developers, testers, Business Analysts, Project managers. 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.
4	Students are required to prepare working model of the Project and simultaneously prepare a report. In general project can be - i. Prototype (design, make, test and evaluate). ii. Application development using hardware/software.
5	Students Must Submit One Hard copy and one Soft copy each of Project Report and soft-copy of the project code or the working model.
6	Generically these titles are to be covered in Project Report: a. Problem Definition b. Platform and/Hardware Specifications c. Feasibility Study: Cost Estimation, Time Estimation d. Various Design UML charts/diagrams as applicable like Use Case Diagram, Activity Charts, Class Hierarchy, DFD, CFD, ER-Diagrams, Dependency charts or any other e. Important project Code f. Testing details g. Limitations h. Future Scope/Extendibility i. Books/References/Websites (Other titles may be added and used as applicable, based on the nature of project)

7	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 shown and keep proper notings.Impart proper guidance. This will assist in proper evaluation of students. Format of cover page of diary is as Annexure IV. Project diary may contain not more than 5-10 pages.

Course Implementation Stages:

1. **Orientation Session:** Portfolio Incharge faculty has to coordinate conduction of Project orientation session during last week of fifth semester.
2. **Problem Search and problem statement finalization:** Students have to undergo survey activity under the guidance of faculty . This activity maybe started during earlier semester in parallel with Seminar activity and **completed during first week of semester start.**
3. **Requirement Gathering :** One week to be utilized for gathering detailed project requirements including human resource, technical requirements/resources (software and hardware platforms), feasibility study and cost requirements. Presented to the faculty.
4. **Planning: Next week** must be utilized towards prepare a detailed project proposal and plan which must be executed or implemented within the time allocated. **Planning includes resources required, work allocation, time estimations and cost estimations.** Decide the development model to be implemented.
5. Outcome to be published under **project proposal .** May only be submitted in softcopy.
6. **Project Development, Testing& Report preparations:** Project development to proceed under faculty guidance as per planned.
7. **Project Demonstration:** Phase wise demonstration to faculty is done. The project would have to go through minimum two demonstrations :
    a. Preliminary demonstration (Given to faculty guide)
    b. Final Demonstration: During ESE final demonstration of working model is to be presented.

Note:

i. Student must be maintaining a project diary simultaneously as well as preparing a project report, periodically monitored and assessed by the teacher as per provided RUBRICS.

ii. Some stages maybe done recursively.

6. ASSESSMENT OF PROJECT WORK

A. Progressive Assessment (PA) Guidelines and criteria

The assessment of the students in the fifth semester Progressive Assessment (PA) for 50 marks is to be done based on following criteria.

Sr. No.	Criteria	Marks
1	Topic Selection & Problem definition	10
2	Requirement Gathering	10
3	Stage wise progress as per discussion	10
4	Involvement in project development	10
5	Report Writing	10

B. End Semester Exam Assessment (ESE) criteria/Term Work assessment criteria

The assessment of the students in the fifth semester End-Semester-Examination (ESE)for 50 marks is to be done based on following criteria. Thisassessment shall be done by the Faculty.

Sr. No.	Criteria	Marks
1	Knowledge	20
2	Development	20
3	Innovation	5
4	Presentation	5

7. THEORY COMPONENTS

NA

8. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

NA

9. SUGGESTED STUDENT ACTIVITIES

NA

10. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

As per the guidelines mentioned in Annexure-I or any other guidelines given by faculty.

11. SUGGESTED MICRO-PROJECTS

NA

12. SUGGESTED LEARNING RESOURCES

As per the guidelines mentioned in Annexure-I or any other guidelines given by faculty.

13. SOFTWARE/LEARNING WEBSITES

NA

14. 14.PO - COMPETENCY- CO MAPPING

- **Mapping Course Outcomes with Program Outcomes:**

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

- **Mapping Course Outcomes with Program Specific Outcomes:**

CO /PSO	PSO1	PSO2
CO1	3	3
CO2	3	3
CO3	3	3
CO4	3	3
CO5	3	3
CO6	3	3
CO7	3	3

Annexure-II
Major Project Report

After completion of the project work, every student will submit a project report which should contain the following:

1. Cover Page (as per annexure 1)
2. Title page (as per annexure 2)
3. Certificate by the Guide (as per annexure3)
4. Acknowledgment (The candidate may thank all those who helped in the execution of the project.)
5. Abstract (It should be in one page and include the purpose of the study; the methodology used.)
6. Table of Contents(as per general guidelines):Detailed description of the project (This should be split in various chapters/sections with each chapter/section describing a project activity in totality). This portion of report should contain all relevant diagrams, tables, flow charts, which are properly labeled.
7. Conclusion
8. References (The listing of references should be typed 2 spaces below the heading "REFERENCES" in alphabetical order in single spacing left – justified. It should be numbered consecutively (in square [ ] brackets, throughout the text and should be collected together in the reference list at the end of the report. The references should be numbered in the order they are used in the text. The name of the author/authors should be immediately followed by the year and other details). Typical examples of the references are given below:

Report Specifications:

1. Project Report's Cover Type: Hard-bound
2. Color of Project Report Cover: Black only with golden alphabets (as per annexure 1)
3. Number of Copies: 5 (Individual copies(each per student) + Departmental Copy(one))
4. Paper Size (orientation): A4 (portrait)
5. Margins: 1" top / bottom / right and 1.5" left
6. Font Type: Times New Roman
7. Font Size: 16 bold for chapter names, 14 bold for headings and 12 for normal text
8. Line Spacing: 1.5 throughout
9. Page Numbering: Bottom center of page in the format – Page 1 of N

NOTE: Project report must contain only a relevant and short mention – technology or platform or OS or tools used . It must be more focussed on project work carried out and its implementation details without including any source code.

Details of Softcopy to be submitted:

CD of the project work is required to be pasted on the back cover of the project report in clear packet, which should include the following folders and contents:

1. **Presentation** (should include a PPT about project in not more than 15 slides)
2. **Documentation** (should include a word file of the project report)
3. **SourceCode** (full source code of the project with libraries used)
4. **Program** (final copy of the project executable)
5. **Support** (any third party tools used or runtime environment setups that are required to run the project)
6. **Help** (user manual on how to run the project)

NOTE: CD must be checked for any harmful viruses before submission. Source Code and Program folders can be combined into single folder **Project** if it's a web project etc.

Annexure-III

Government Polytechnic,Pune

(An Autonomous Institute of Government of Maharashtra)

CERTIFICATE

This is to certify that

1)Name Of Student Enrollment Number

2)Name Of Student Enrollment Number

3)Name Of Student Enrollment Number

4)Name Of Student Enrollment Number

Has completed the necessary project work and prepared the bonafide on

"Project Title"

In a satisfactory manner as a partial fulfillment of requirement of the

THIRD YEAR DIPLOMA IN

INFORMATION TECHNOLOGY

FOR THE ACADEMIC YEAR

2017-2018

(H.O.D) **(Principal)**

(Internal Guide) **(External Examiner)**

Table of Contents

***Students can add/remove/edit chapter names as per the discussion with their guide**

Annexure-IV

PROJECT DIARY

Name of the Student: _____ Name of Guide (Faculty) : _____

Enrollment Number: _____ Semester: _____Project batch Number: _____

Date	Discussion Topics/Activity Details	Work Allotted Till Next Session/Corrections Suggested/Faculty Remarks	Dated Signature of Faculty

Dated Signature of Faculty **Dated Signature of HOD**

Annexure-V

Rubrics

Progressive Assessment					Project Presentation			
Topic Selection & Problem definition (10)	**Requirement Gathering (10)**	**Stage wise progress as per discussion (10)**	**Involvement in project development (10)**	**Report Writing (10)**	**Knowledge (20)**	**Development (20)**	**Innovation (5)**	**Presentation (5)**

Sign: Name: A.B.Bhusagare (Course Expert/s)	Sign: Name: U. V. Kokate Dr. S. B. Nikam (Head of the Department)
Sign: Name: Mr.U.V.Kokate Dr. S. B. Nikam (Programme Head)	Sign: Name: Mr. A.S.Zanpure (CDC In-charge)

Government Polytechnic, Pune

'180OB' – 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 the Course	Seminar
Course Code	CM4103
Prerequisite course code and name	90 credits & Level - I passed
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	
00	00	02	02	**Marks**	NA	NA	25	25	50

Legends: L- Lecture, P- Practical, T- Tutorial, C- Credit, ESE-End Semester Examination, PA- Progressive Assessment (Test I, II/Term Work), *- Practical Exam, $- Oral Exam, #- Online Examination each Lecture/Practical period is of one clock hour.

2. RATIONALE

This course tends to mould students towards integrating the knowledge acquired throughout and applying it to understand and interpret evolving technologies in order to strengthen the confidence over acquired Engineering skills and thus fulfill the objective of Diploma Programme. Seminar mainly serves the purpose of developing learning-to-learn skills with an aim to develop the following attributes in the students:

3. COMPETENCY

The course should be taught and implemented with the aim to develop the required course outcomes (COs) so that students will acquire following competency needed by the industry:

- **Interpret innovative/new technologies independently.**

4. COURSE OUTCOMES (COs)

After undergoing this course, the student will demonstrate the following Course Outcomes

1. Analyze and study new technologies/tools.
2. Apply technical knowledge.
3. Compile and Write a Seminar Report
4. Work independently, prepare and deliver presentations.

5. GUIDELINES FOR UNDERTAKING A SEMINAR :

1. Department must organize a Seminar Orientation session for all the registered students.
2. The process of conducting a Seminar includes allocating a topic to individual student who should perform the required search, decide on the topic objectives, design and prepare an appropriate method of presentation, and present the topic to their fellow students and teachers with all of the necessary explanation and discussion. Faculty assigned to student should be providing necessary guidance.
3. Students would individually prepare the Seminar report with the following sub-titles:
    a. Acknowledgement
    b. Abstract
    c. Index
    d. List of Figures
    e. Introduction
    f. Information/Chapters related to Seminar topic
    g. Advantages and Disadvantages
    h. Conclusion
    i. References
4. Seminar topic shall be approved by the respective guide.
5. The student will begin to maintain a dated Seminar Diary for the whole semester. This diary should be assessed by respective guide timely. Format of diary is as given in **table I**

Suggested Seminar Activities to be performed:-

- Collection of **at least three Seminar topics** on recent technologies and presentation of their abstract to faculty guide.
- Finalization of Seminar topic.
- Submission of final abstract on selected topic.
- Weekly interaction of students in group with seminar guide.
- Weekly assessment of seminar and work is labeled as Progressive Assessment.
- Group of Students should prepare and submit Report writing and presentation slides of Seminar in consultation with Seminar guide.
- Presentation of Seminar in well defined manner within specified time.
- Submission of Seminar report with the permission of faculty and Head of the Department..

6. ASSESSMENT OF SEMINAR WORK

- Like other courses, assessment of Seminar work also has two components, first is progressive assessment, while another is end of the term assessment that is
  Term Work.
- The faculty will undertake the progressive assessment to develop the COs in the students. They can give oral informal feedback about their performance and their interpersonal behavior while guiding them on their seminar work every week.
- There will also be regular progressive assessment by the teacher.

A. Progressive Assessment (PA) Guidelines and criteria :

The assessment of the students in the fifth semester Progressive Assessment (PA) for 25 marks is to be done based on following criteria.

Sr. No.	Criteria	Marks
1	Topic Selection	5
2	Regularity in Seminar work as mentioned in Diary	5
3	Overall understanding capability	5
4	Progress in work and efforts displayed (Interactions with Q & A)	10

B. End Semester Assessment(ESE) criteria/Term Work assessment criteria :

The assessment of the students in the fifth semester end-semester-examination (ESE) for 25 marks is to be done as per RUBRICS of Annexure V. This assessment shall be done by the faculty.

7. THEORY COMPONENTS

NA

8. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

NA

9. SUGGESTED STUDENT ACTIVITIES

NA

10. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

As per the guidelines mentioned in Annexure-I or any other guidelines given by faculty.

11. SUGGESTED MICRO-PROJECTS

NA

12. SUGGESTED LEARNING RESOURCES

As per the guidelines mentioned in Annexure-I or any other guidelines given by faculty.

13. SOFTWARE/LEARNING WEBSITES

NA

14. PO - COMPETENCY- CO MAPPING

- **Mapping Course Outcomes with Program Outcomes:**

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

- **Mapping Course Outcomes with Program Specific Outcomes:**

CO /PSO	PSO1	PSO2
CO1	2	2
CO2	2	2
CO3	1	2
CO4	3	2

Annexure-I

Seminar Report Guideline

1. **All students should submit their seminar report to their respective guide on or before _____.**
2. **Seminar report must include**
    1. **Cover Page**
    2. **Certificate**
    3. **Acknowledgement**
    4. **Index**
    5. **Abstract**
    6. **Chapters (as per discussion with guide)**
    7. **References/Bibliography**
3. The page size of the seminar report should be in A4 size.
4. The seminar report should be **Spiral bonded.**
5. Two copies of the report (hard copy only). One for self and one to be submitted to department.
6. **Page Numbering (Centered having format Page No__ of __)**
7. **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
8. **Text**

    Font: Times New Roman
    Size: 12 point
    Alignment: Justified (Full Text)

9. **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

Annexure-II

Government Polytechnic, Pune-16

(An Autonomous Institute of Government of Maharashtra)

A
Seminar Report
On

"SEMINAR TITLE"

SUBMITTED BY:

<Name of the student>

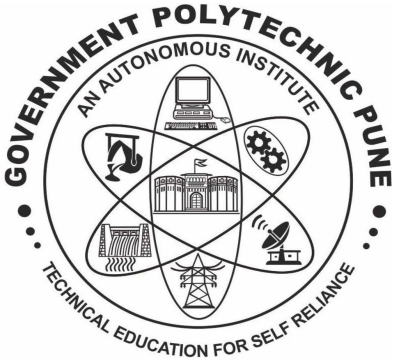
Under the Guidance of

<Guide Name>

DEPARTMENT OF INFORMATION TECHNOLOGY
(Academic Year: 2019-20)

Government Polytechnic, Pune-16
(An Autonomous Institute of Government of Maharashtra)

Department Information Technology



CERTIFICATE

This is to certify that Ms/Mr._____with Enrollment No._____, of Third Year Diploma in Information Technology has successfully completed the seminar titled "_____" as part of his/her diploma curriculum in academic year 2019-20.

Seminar Guide	**H.O.D**	**Principal**
(Shri/Smt. Name of Guide)	(Mrs. M. U. Kokate)	(Dr. V. S. Bandal)

ACKNOWLEDGEMENT

Acknowledgement should be prepared by the students in their wordings expressing their gratitude towards department.

Government Polytechnic Pune

Department of Computer Engineering

General Guideline

for

Seminar-CM4103

Annexure-III

Department of Computer Engineering
GENERAL SEMINAR GUIDELINES (Odd 2019)

Purpose of carrying out Seminars is to develop self learning capability of students wherein they will be able to apply the knowledge gathered to a new technology, understand it and deliver the presentations accordingly. All students must follow the guidelines given below:

- Seminar Presentation should be on Technical Topic only. The topic (technology) chosen may be related to perspective project.
- Seminar topic contents cannot be the contents of their Diploma course.
- Evaluation of Seminar should be based on Topic Selection, Technical Contents, Content Understanding, Content Delivery and Response to the Questions.
- Seminar topics across all students must not be repeated.
- Seminar Topics of last year should not be repeated.
- Each student has to collect 3-4 topics, present their abstract to guide, discuss with guides and finalise topics through number of discussions. Abstract must also contain key terms in topics.
- Each abstract should not exceed 200 words.
- Abstract must be written with grammatically correct statements. Shortcuts must not be used for any words and should not contain spelling mistakes with neat and clean handwriting.
- Each student must prepare and attach the seminar diary to their Seminar Reports containing:
    - Table I .
    - Abstract of 3-4 topics with keywords.
- Every student must report to respective guide as per timetable, perform necessary work and submit as per plan, get necessary attestations on activities done in seminar diary on due dates and time as per Time Table.

Annexure-IV

SEMINAR DIARY

Name of the Student: _____ Name of Guide (Faculty) : _____
Enrollment Number: _____ Semester: _____ Batch Number: _____

Date	Discussion Topics/Activity Details	Work Allotted Till Next Session/ Corrections Suggested/Faculty Remarks	Dated Signature of Faculty

Dated Signature of Faculty **Dated Signature of HOD**

Annexure-V

Rubrics

SeminarTerm work(50)										
				Presentation(20)						
Topic Selection(5)	**Regularity in Seminar Work(5)**	**Overall understanding capability(5)**	**Knowledge (Q & A) (10)**	**Speech Clarity (5)**	**Body Language(3)**	**Neat Dressing(2)**	**Slides (10)**	**Report Writing(5)**	**Total Out of (50)**	**Marks mapped to (25)**

Sign: Name: 1. A.B.Bhusagare (Course Expert/s)	Sign: Name: U. V. Kokate Dr. S.B. Nikam (Head of the Department)
Sign: Name: Mr.U.V.Kokate Dr. S. B. Nikam (Programme Head)	Sign: Name: Mr. A.S.Zanpure (CDC In-charge)

Government Polytechnic, Pune

(An Autonomous Institute of Govt. of Maharashtra)

Scheme: 180 OB

Programme Name	**Diploma in Computer Engineering** **Diploma in Information Technology** **Diploma in Electronics and Telecommunication**
Programme Code	01/02/03/**04**/05/**06/07**/08/15/16/17/18/19/21/22/23/**24**/**26**
Course Title	**Professional Practices-I**
Course Code	**CM4104**
Prerequisite course code and name	**NA**
Class Declaration	**No**

1. TEACHING AND EXAMINATION SCHEME

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

Legends: L- Lecture, P- Practical, T- Tutorial, C- Credit, ESE-End Semester Examination, PA- Progressive Assessment (Test I, II/Term Work), *- Practical Exam, $- Oral Exam, #- Online Examination each Lecture/Practical period is of one clock hour

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. COMPETENCY

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

1. **Learn independently and develop lifelong learning ability.**

4. 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 lifelong learning ability.**
3. **Work in group.**
4. **Learning through observations and Interactions.**

5. **Understand and prepare Reports.**

5. PRACTICALS / EXERCISES

Sr. No.	Learning Outcome	Practical Exercises	Marks	Approx. Hrs.
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	**Micro-Project –** **a) Microprojects allocation and development (06-08 hrs.)** 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. **b) Report Writing :** Not more than 7-8 pages **(to be prepared simultaneously with development)** 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. **c) Microproject Presentations/Demonstrations (04 hrs.)** (Preferrably by arranging Project exhibition/ classroom presentations as is applicable)	20M	12
2	a. Learn from alternate sources. b. Enhance self learning ability	**MOOCs** (Massive open online courses)**: Undertake SWAYAM/NPTEL/Spoken Tutorial/Any other Online Courses** learning courses and certificate courses **Each individual student can select any relevant online course under the guidance of course teacher as per interest areas.**	10M	10
3	a. Interpersonal skill and personal skill development. b. Develop conflict resolution ability.	**Group Activity:** 1. Group Activity: Case studies to be discussed in a group and presentation of the same by group and summarization by group leader.	5M	06

		2. Role play by individual/group leader. **3.** Sharing of self -experiences in a group. **Out of above three anyone activity can be conducted for group of students. Different groups can be considered for different activities based on their likings**.		
4	a. Learning through observations. b. Understanding professional environment. c. Report writing.	**Industrial Visit** 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.	**Expert Lecture** 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
		Total	**50**	**32**

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

6. 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**.**

7. THEORY COMPONENTS:

NA

8. 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	--	--	--	--
	Total	**32**	--	--	--	--

9. 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.

10. SPECIAL IMPLEMENTATION/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. Micro project:
   - 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 Micro project. 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.

11. SUGGESTED MICRO-PROJECTS- Refer Point 5

12. LEARNING RESOURCES

Sr. No.	Title of Book	Author	Publication
1	Personality Development and soft skills	Barun K. Mitra Oxford University	Oxford University Press, ISBN:9780199459742
2	Entrepreneurship	Rajeev Roy Oxford University	Paperback Publication ISBN:-0190125306
3	First Semester learnt & Second semester learning courses reference Books	--	--
4	Journals and magazines IEEE Journals, IT Technologies	--	--
5	Local newspapers and events	--	--

13. SOFTWARE/LEARNING WEBSITES

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

14. PO - COMPETENCY- CO MAPPING

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

PSO - COMPETENCY- CO MAPPING

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

(Smt. M.U.Kokate) (Smt.A.D.Kshirsagar) (Smt.A.B.Bhusagare) (Smt.Pranita Zilpe) (Smt.B.K.Vyas) Signature of Course Experts	(Mr.U.V.Kokate) Signature of Head of the Department (Computer Engineering)
Sign: Name: Mr. U. V. Kokate Dr. S. B. Nikam Programme Head	(Mr. A.S. Zanpure) Signature of CDC In-charge

Micro-Project Guidelines

a. Micro-project selection should be based on First Semester learnt and Second Semester learning courses.
b. 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 .
c. Abstract must not be greater than 100 words. Report must not be more than 7-10 pages.
d. Micro-project topics across all students must not be repeated.
e. Due care must be taken to write reports with grammatically correct statements and in neat and clean handwriting. Statement must not contain shortcups and spelling mistakes.
f. Evaluation of Micro-project should be based on Topic Selection, Problem Definition, Requirement gathering, Development, Presentation , Report writing and Response to the Questions.
g. Micro-project Report must include
    i. Cover Page
    ii. Index
    iii. Abstract
    iv. Chapters
    v. References/Bibliography
h. The page size of the Micro-project report should be A4 .
i. Page Numbering (Centered having format Page No_____of __)
j. **Paper Size:** A- 4 size paper
    i. Margins :

Top: 1" (1 inch=2.54cm)
Bottom: 1.15" (2.86cm)
Left: 1.5"
Right: 0.6"

ii. **Line Spacing:** 1.5 line
iii. Title of Chapter

Font: Times New Roman (Bold face)
Size: 14 point
Alignment: Centre

k. Text

Font: Times New Roman
Size: 12 point
Alignment: Justified (Full Text)

l. 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)

Assignmnet-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 COMPUTER ENGINERING

Industry Visit Report format
Government Polytechnic, Pune

Department of Computer Enginerring

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. SAFTY MEASURESS

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.
2. Association of Topics/Title/Concepts with courses learnt(Mentione Cours Name).
3. High light the best/Motivational Part:

Signature of Student:

Government Polytechnic, Pune

(An Autonomous Institute of Govt. of Maharashtra)

Scheme: 180 OB

Government Polytechnic, Pune

'180OB' – 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	NA
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	
00	00	02	02	Marks	NA	NA	NA	50	50
				Exam Duration	-	-	-		

Legends: L- Lecture, P- Practical, T- Tutorial, C- Credit, ESE-End Semester Examination, PA- Progressive Assessment (Test I, II/Term Work), *- Practical Exam, $- Oral Exam, #- Online Examination each Lecture/Practical period is of one clock hour.

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. COMPETENCY

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

1. **Learn independently and develop lifelong learning ability.**

4. 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.**

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.	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	**Micro-Project –** **a) Microproject allocation and development (06-08 hrs.)** 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 **Third and Fourth 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. **b) Report Writing :** Not more than 7-8 pages **(to be prepared simultaneously with development)** 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. **c) Microproject Presentations/Demonstrations (04 hrs.)** (Preferrably by arranging Project exhibition/ classroom presentations as is applicable)	CO1	12

2	a. Learn from alternate sources. b. Enhance self learning ability	**MOOCs**(Massive open online courses)**:** **Undertake SWAYAM/NPTEL/Spoken Tutorial/Any other Online Courses**learning courses and certificate courses **Each individual student can select any relevant online course under the guidance of course teacher as per interest areas.**	CO2	10
3	a. Interpersonal skill and personal skill development. b. Develop conflict resolutionability.	**SWOT Analysis :** Self SWOT analysis **Study Habits (Group discussions)**Sharing of self -experiences in a group **on** Note taking, Methods of Learning, Memory Enhancement, self - Study Techniques,Techniques for effective Reading and Writing. **Stress Management(**Role play by group) Stresses in groups, how to control emotions, Strategies to overcome stress, understanding importance of good health to avoid stress. **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**.	CO3	06
4	a. Learning through observations. b. Understanding professional environment. c. Report writing.	**Industrial Visit** 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 sameshould 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.	**Expert Lecture** 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
		Total		**32**

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

6. MAJOR EQUIPMENT/ INSTRUMENTSREQUIRED

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**.**

7. THEORY COMPONENTS: NA

8. SPECIFICATION TABLE FORQUESTION 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	--	--	--	--
Total		**32**	--	--	--	--

9. 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.

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:

1. Microproject:

- Teachers must brief the students about outcome expected through Microproject, form groups, and allocatemicro 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.

2. 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).

3. 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

4. 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.

11. SUGGESTED MICRO-PROJECTS

Refer point no.5

12. LEARNING RESOURCES

Sr. No.	Title of Book	Author	Publication
1	Personality Development and soft skills	Barun K. Mitra Oxford University	Oxford University Press, ISBN:9780199459742

2	Entrepreneurship	Rajeev Roy Oxford University	Paperback Publication ISBN:-0190125306
3	First Semester learnt & Second semester learning courses reference Books	--	--
4	Journals and magazines IEEE Journals, IT Technologies	--	--
5	Local newspapers and events	--	--

13. SOFTWARE/LEARNING WEBSITES

1. http://www.nptel.ac.in
2. http://www.seminarforyou.com

14. PO - COMPETENCY- CO MAPPING

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

PSO - COMPETENCY- CO MAPPING

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

(Smt. U.V.Kokate) (Smt. M.U.Kokate) (Smt.A.D.Kshirsagar) (Smt.A.M.Galshetwar) (Smt.Pranita Zilpe) (Smt.A. B. Bhusagare) Signature of Course Experts	U. V. Kokate Dr. S.B. Nikam (Head of the Department)
Sign: **Name:** Mr. U. V. Kokate Dr. S. B. Nikam (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 3-4students 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 shortcups 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/	Weekly Assignment	Final	Total(20)
tutorial (05)	submission (10)/ Progressive assessment through internal orals	Certificate(05) Or final Internal orals	

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)

Assignmnet-5 :Rubrics for Professional / Industrial Expert Lecture Evaluation

Note : Students who have attended Lecture will only be eligiblefor 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: _____
Name of Student: _____

Speaker:_____ Enrollment No.:___Organized By:_____Date & Time:__
_____ Venue : _____Term:_____

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

Signature of Student

Government Polytechnic, Pune

'180 OB' – Scheme

Programme	**Diploma in Computer Engineering** **Diploma in InformationTechnology**
Programme code	01/02/03/04/05/**06**/**07**/08/15/16/17/18/19/21/22/23/24/**26**
Name of Course	**Web development using JavaScript**
Course Code	**CM4106**
Prerequisite course code and name	**NA**
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	
01	01	02	04	Marks	NA	NA	25	50	75
				Exam Duration	NA	NA	-		

Legends: L- Lecture, P- Practical, T- Tutorial, C- Credit, ESE-End Semester Examination, PA- Progressive Assessment (Test I, II/Term Work), *- Practical Exam, $- Oral Exam, #- Online Examination each Lecture/Practical period is of one clock hour

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 variousteaching 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 forvalidations
4. Create Webpages with Rollovers, Status Bar, Banners and Slideshow.
5. Create web page application using Angular JS

5. SUGGESTED PRACTICALS/ EXERCISES

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.	5	Writing basic application demonstrating Angular JSexpressions and directives (Any 2)*	CO5	02
14.	5	Writing Simple application using Angular JS andForms (Any 2)	CO5	02
15.	All	Micro-project* (Refer point 11 for micro project list)	All	04
			Total Hrs	**32**

(*) Indicates compulsory practicals

Sr. No.	Performance Indicators	Weightage in %
a	Coding	70
b	Designing	10
c	Answer to sample Questions	10
d	Submit Report in time.	10
	Total	**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.	Equipment Name with Broad Specifications	Experiment Sr. No.
1.	Any browser	All
2.	Any word processing IDE	All

7. THEORY COMPONENTS

Unit Outcomes (UOs) (in cognitive domain)	**Topics and Sub-topics**
UNIT I - An Inside Look at JavaScript Programming (Hours- 02)	
1a. Create a JavaScript pageusing 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
UNIT II - Arrays, Functions and String (Hours- 04)	
2a. Write a JavaScript usingarray and Function. 2b. Implement various stringfunctions. .	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. 2.2 Function: Defining, The Scope of Variables and Arguments, calling a Function, Function Calling Another Function, Returning Values from a Function. 2.3 String: Joining Strings, Dividing Text, Converting Numbers and Strings, Changing the Case of the Strings, Strings and Unicode
UNIT III - Forms and Event Handling, Cookies and Browser Windows (Hours- 04)	
3a. Develop JavaScript tohandle event 3b. Write JavaScript to handleforms using intrinsic function 3c Manage cookies using JavaScript	2.4 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 2.5 Cookie Basics, Creating, Reading, Setting the Expiration Date, Deleting Personalizing and Experience Using a Cookie. 2.6 Giving the New Window Focus, placing a Window into Position on the Screen, Changing the Contents of a Window, Closing the Window, scrolling a Web Page, Opening Multiple Windows at Once, Creating a Web Page in a New Window
UNIT IV - Regular Expressions, JavaScript and Frames, Rollovers, Status Bar, Banners, Slideshow, Protecting Your Webpage (Hours- 04)	
4a. Validate form using regularexpressions. 4b. Implement banners slideshow and rollovers to makewebsite come alive	4.1 Regular Expression: The Language of a Regular Expression, Replace Text, Return the Matched Characters, Using a Regular Expression, Invisible Borders 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 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,

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
	Creating a Slideshow
UNIT V - Introduction to Angular JS (Hours- 02)	
5a. Develop a sample web page using Angular JS	5.1 Introduction of Angular JS, Core features of Angular JS Angular JS as MVC Architecture. 5.2 Agular JS components: directives, expressions, controls, functions, filters 5.3 Creating and executing basic application using Agular 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	--	--	--	--
Total		**16**	--	--	--	--

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.** Undertake micro-projects.
- **d.** Develop variety of program to improve logical skills.
- **e.** 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:

1. Massive open online courses (***MOOCs***) may be used to teach various topics/subtopics.
2. 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).

3. With respect to item No.8, teachers need to ensure to create opportunities and provisions for ***co-curricular activities***.
4. Guide student(s) in undertaking micro-projects.
5. Correlate subtopics with power plant system and equipment.
6. Use proper equivalent analogy to explain different concepts.
7. Use Flash/Animations to explain various components, operation and
8. Teacher should ask the students to go through instruction and technical manuals

11. SUGGESTIVE MICRO-PROJECTS

Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her. 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. (Affective Domain Outcomes). Each student will have to maintain activity chart consisting of individual contribution in the project work and give a seminar presentation of it before submission. 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 couldbe added by the concerned faculty:

a. Password pattern matching

Design a Webpage that accepts Username and Password. Provide appropriate validation to Username. Use regular expression only, to validate the password with following pattern:

i. password must have at least 8 characters
ii. at least an upper-case letter,
iii. a lowercase letter,
iv. a number
v. and probably a symbol.If invalid display accordingly.

b. Control Window Locations

Create a basic page in html that includes a single image.
When the image is clicked, it should open 5 new windows in the following locations on the screen:

- one in the top left corner of the screenone in the top right corner
- one in the lower left corner one in the lower right corner one in the center of the screen

The URLs displayed for each window can be of your choosing.

c. Multiple Rollovers -

i. Create a basic page in html that displays 3 unique images.
ii. Create a separate rollover for each of these images, i.e., onMouseOver display anew, unique image, onMouseOut return it to the original image.
iii. Add a fourth image to your page.

iv. The fourth image when mouse over will not change. Instead, it will change theother three images on the page (these images do not have to be unique).
v. Then, onMouseOut of the fourth image, return the other 3 images to their originalimages.

a) Preload all necessary images.
b) Disable hyperlinks on the images, if using the <a> tag to complete this.

12. SUGGESTED LEARNING RESOURCES

S. No.	Title	Author	Publisher, Edition, Year of publication, ISBN Number
1	JavaScript Demystified	Jim Keogh	Tata McGraw Hill,First Edition - June 2005, ISBN: 0072254548
2	JavaScript in 24 hours	Michael Moncur	Sam's Publishing; 7th edition – February 2019, ISBN-10: 0672338092 ISBN-13: 978-0672338090
3	AngularJS: Up and Running - Enhanced Productivity with Structured Web Apps	Shyam Seshadri, Brad Green	Shroff/O'Reilly; First edition - October 2014, ISBN-10: 9789351108016 ISBN-13: 978-9351108016

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

CO/PSO	PSO1	PSO2
CO1	-	3
CO2	-	2
CO3	-	2
CO4	-	2
CO5	-	3

Sign: Name: 1. Mrs. M. U. Kokate 2. Mrs. M.G. Yawalkar 3. Mrs. A. S. Paike (Course Experts)	Sign: Name: Mr. U.V. Kokate Dr. S.B. Nikam (Head of Department) (Department of Computer Engineering)
Sign: Name: Mr. U.V. Kokate Dr. S.B. Nikam (Programme Head) (Department of Computer Engineering)	Sign: Name: Mr. A.S. Zanpure (CDC In-charge)

Government Polytechnic, Pune

'180 OB' – Scheme

Programme	**Diploma in Computer Engineering**
Programme code	01/02/03/04/05/**06**/07/08/16/17/21/22/23/24/**26**
Name of Course	**Software Engineering and Testing**
Course Code	**CM4107**
Prerequisite course code and name	**NA**
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	
04	00	02	06	Marks	80	20	25	25	150
				Exam Duration	3 Hrs	1 Hr			

Legends: L- Lecture, P- Practical, T- Tutorial, C- Credit, ESE-End Semester Examination, PA- Progressive Assessment (Test I, II/Term Work), *- Practical Exam, $- Oral Exam, #- Online Examination each Lecture/Practical period is of one clock hour

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

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1.	1,2	Develop software project using any process model and create Software Requirement Specification.	1,2	04
2.	2	Develop UML Modeling for assigned projects	2,3	04
3.	3	Estimate cost for assigned project using any decomposition technique.	3	04
4.	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	04
5.	5	Design test cases for back box testing for assigned project.	4	02
6.	5	Design test cases for any Web Site using Regression testing.	4	04
7.	6	Design Test plan for any application	5	02
8.	6	Prepare defect report after executing test cases for any application.	6	02
9.	4	Write test scripts for any web page using Selenium automation tool.	4	02
10.	All	Micro-Project	All Cos	04
		Total		**32**

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
Total		**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	Experiment Sr. 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

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
Unit -I Introduction to Software Engineering (Weightage-12, Hours- 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.
Unit-II Requirement, Design and Modeling Engineering (Weightage- 14 , Hours- 10)	
2a. Define Customer need – Requirement and state various tasks 2b. Use various requirement gathering techniques 2c. Use & Design use case for Requirement Elicitation 2d. Validate Requirement and Build Analysis model (SRS) 2e. Design UML Diagrams for software projects	2.1 Requirement Engineering Tasks-Inception, Elicitation, Elaboration, Negotiation, Specification, Validation 2.2 Eliciting Requirements- Collaborative Requirements Gathering, Quality Function Deployment ,User Scenarios ,Elicitation Work Products 2.3 Software Requirement Specification- Need of SRS, Template of SRS 2.4 Design Concepts- Abstraction, Architecture, Patterns, Modularity, Information Hiding 2.5 UML Modeling- Data flow diagram, Class diagram, Sequence diagram, Use case diagram, Activity diagram , State chart diagram, Component diagram, Deployment diagrams
Unit –III Software Project Management , Scheduling And Quality Assurance (Weightage- 16 , Hours- 12)	

3a. Recognize need of Software project Management. 3b. Apply various techniques for Estimation 3c. Determine Size using Function-Point metric and Cost Estimation using COCOMO model. 3d. Design and implement RMMM Plan 3e. Describe steps for Project 3f. Scheduling, and tracking 3g. Describe Software Quality Assurance	3.1 The Management Spectrum: The people, The product, The Process, The project 3.2 Decomposition Techniques-LOC and FP based estimation, COCOMO model 3.3 Risk Management: Software risk, Risk Identification, RMMM(Risk Mitigation, Monitoring and Management) 3.4 Project Scheduling -Basic principles of scheduling 3.5 Project Tracking- Timeline chart, Gantt chart 3.6 Software Quality Assurance-The-ISO 9001 standard ,Six Sigma for Software Engineering
Unit-IV Basics of Software Testing and Automation Testing (Weightage- 10 , Hours- 10)	
4a. Identify need of testing in software development. 4b. Analyze the quality of Software. 4c. Discover how to improve testing efficiency by automating your test. 4d. Test software using automated test tools.	4.1 Software Testing-Objectives, Error and bug terminology 4.2 The Fundamental Test Process 4.3 Quality Assurance and Quality Control, Testing, Verification and Validation. 4.4 Automation Testing : Introduction, Features of test tool, Guideline for selecting a tool 4.5 Static and dynamic testing tool, Advantages and Disadvantages of using tools, When to use Automated test tools.
Unit-V Types Of Testing (Weightage- 14 , Hours- 14)	
5a. Test software using different testing techniques 5b. Test software for Acceptance testing. 5c. Test software for System Testing 5d. Test software using Special Testing techniques.	5.1 White box testing -Static testing , dynamic testing 5.2 Black box testing- Requirement based testing, Positive and Negative testing, Boundary value analysis, Decision tables, Equivalence partitioning, User documentation testing. 5.3 Integration testing- Top-Down and Bottom-Up integration, 5.4 Acceptance testing-Alpha and Beta Testing, Acceptance testing 5.5 System Testing- Performance testing, Stress testing, Recovery testing, Compatibility testing, Security testing, and Usability testing. 5.6 Special Tests: Smoke and Sanity testing, Regression testing, GUI testing, Object oriented application testing, Client-Server testing, Web based testing.
Unit-VI Test and Defect Management (Weightage- 14 , Hours- 10)	
6a. Prepare test plan for given application. 6b. Describe Test management process	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

6c. Find Defect using different technique. 6d. Describe Defect Life cycle	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.

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	02	04	06	12
II	Requirement, design and modeling engineering	10	04	04	06	14
III	Software project management ,scheduling and quality assurance	12	04	04	08	16
IV	Basics of software testing and automation testing	10	02	04	04	10
V	Types of testing	14	04	04	06	14
VI	Test and defect management	10	04	04	06	14
Total		**64**	**20**	**24**	**36**	**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 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

Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her. 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. (Affective Domain Outcomes). Each student will have to maintain activity chart consisting of individual contribution in the project work and give a seminar presentation of it before submission. 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	Roger S. Pressman,	Mc. Graw Hill, 6th Edition ,2012 • ISBN-13:978-0-07-070113-7
2	Software Testing: Principles and Practices	Srinivasan Desikan Gopalaswamy Ramesh	Pearson,2006 •ISBN-13:978-8177581218

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: 1. R.J Chavan 2. S.B Gosavi 3. L.S. Korade (Course Experts)	Sign: Name: 1. Mr. U.V. Kokate 2. Dr. S. B. Nikam (Head of Department) (Department of Computer Engineering)
Sign: Name: 1. Mr. U.V. Kokate 2. Dr. S. B. Nikam (Programme Head) (Department of Computer Engineering)	Sign: Name: Mr. A.S.Zanpure (CDC In-charge)

Government Polytechnic, Pune

'180 OB' – Scheme

Programme	**Diploma in Computer Engineering**
Programme code	01/02/03/04/05/**06**/07/08/16/17/21/22/23/24/**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				
					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 Hrs.			

Legends: L- Lecture, P- Practical, T- Tutorial, C- Credit, ESE-End Semester Examination, PA- Progressive Assessment (Test I, II/Term Work), *- Practical Exam, $- Oral Exam, #- Online Examination each Lecture/Practical period is of one clock hour

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

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.	5,6	A] Study of RIP Simulator, B] Write a program to design symmetric and asymmetric key cryptography	6	02
10.	6	Micro-project (Refer point 11 for micro project list)	ALL CO's	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
d.	Learn how World Wide Web is organized	10
e.	Compare the different interconnecting systems throughout the world.	20
f.	Understand various security and protection issues in the Networking Environment	10
g.	Submission of report in time	10
	Total	**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	Experiment Sr. No.
1	Computers	ALL
2	Networking (Internet)	ALL

7. THEORY COMPONENTS

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
Section I	
UNIT- I. Network Layer I (Weightage-14, Hours-12)	
1a. Define Logical addresses development 1b. Explain NAT and its use 1c. Distinguish between IPV4 and IPV6 1d. Choose between RARP, BOOTP and DHCP	**1.1**Logical Addressing: IPv4 Addresses- Address space, Notations, classful addressing, classless addressing, Network address translation (NAT), IPv6 Addresses- Structure, Address space **1.2** Internetworking: 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 **1.3** Address Mapping: Mapping Logical to Physical Addresses-ARP, Mapping Physical to Logical Addresses – RARP, BOOTP and DHCP
UNIT- II. Network Layer II (Weightage-14, Hours-12)	
2a. List error reporting and query messages. 2b. compare direct and indirect delivery. 2c. Explain use of routing table. 2d. compare multicasting and broadcasting.	**2. 1** ICMP-: Types of messages, Message format, Error reporting, Query **2.2** Delivery: Direct vs Indirect Delivery **2.3** Forwarding- forwarding Techniques, Forwarding Process, Routing Table, Unicast **2.4** Routing Protocols: Optimization, Intra and Interdomain Routing, Distance Vector Routing, Link State Routing, Path Vector Routing **2.5** Introduction to multicasting and broadcasting.

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
UNIT -III Transport Layer (Weightage-12, Hours-08)	
3a. Explain process to process delivery 3b. Compare Multiplexing and demultiplexing 3c. Compare Connection oriented and Connectionless services 3d. Discover TCP and UDP protocols 3e. Categorize network traffic 3f. Prove best congestion control method 3g. Explain techniques to improve QOS	**3.1**Process to Process : Delivery Client/Server Paradigm, Multiplexing and demultiplexing, Connectionlessvs. Connection-Oriented Service, Reliable vs. Unreliable. 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, CongestionControl **3.2**Data Traffic: Traffic Descriptor, Traffic profiles **3.3**Congestion: Network Performance, Congestion Control- Open Loop Congestion Control, Closed Loop Congestion Control, Examples- Congestion Control in TCP and Frame Relay **3.4**Quality of Service: Flow Characteristics, Flow Classes, Techniques to Improve QoS- Scheduling, Traffic shaping, Resource Reservation, Admission Control.
Section II	
UNIT- IV Application Layer I: DOMAIN NAME SYSTEM (Weightage-14, Hours- 12)	
4a. Define name space in WWW. 4b. Recall working of internet 4c. Demonstrate caching work in DNS 4d. Apply remote logging in troubleshooting networking problems 4e. Design Email application 4f. Compare POP and IMAP 4g. Elaborate FTP protocol.	**4.1**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 **4.2**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, **4.3**DNS Messages: Header, Types of Records- Question Record, Resource Record, Registrars, Dynamic, Domain Name Systems(DDNS), Encapsulation. **4.4**REMOTE LOGGING: Remote logging, Telnet **4.5**ELECTRONIC MAIL AND FILE TRANSFER: Electronic Mail- Architecture, User Agent, Message Transfer Agent: SMTP, Message Access Agent: POP and IMAP, Web-based Mail **4.6**File Transfer-File Transfer Protocol (FTP), Anonymous FTP
UNIT - V Application Layer II: WWW AND HTTP (Weightage- 12, Hours- 08)	

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
5a. Illustrate how cookies work 5b. Differentiate between Static Documents and Active Documents. 5c. Explain Proxy Server 5d. Demonstrate how **3** Network Management is done.	**5.1** Architecture: Client(Browser), Server, Uniform Resource Locator, Cookies **5.2** Web Documents: Static Documents, Active Documents, HTTP- HTTP Transaction, Persistent vs. No persistent Connection, Proxy Server **5.3** Network Management System: Configuration Management, Fault Management, Performance Management, Security and Accounting Management.
UNIT- VI Cryptography and Security in the Internet (Weightage- 14 , Hrs.- 12)	
6a. Illustrate the importance of security 6b. Define cryptography 6c. Explain security services 6d. Justify the use of proxy firewall.	**6.1**Introductionto Cryptography: Definitions, Categories, Symmetric Key Cryptography- Traditional Ciphers, Simple Modern Ciphers, Asymmetric –Key Cryptography- RSA, Diffie-Hellman. **6.2**SecurityServices: Message confidentiality, Message Integrity, Message Authentication, Message Nonrepudiation, EntityAuthentication. IPSecurity(IPSec)- Two modes,TwoSecurity protocols, Security Association **6.3** PGP-Security Parameters, Services, A Scenario, PGP Algorithms, Key Rings, PGP Certificates Firewalls- Packet filter firewall, Proxy firewall.

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
Section I						
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
Total		32	30	6	4	40
Section II						
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
Total		32	28	6	6	40
Total		**64**	**58**	**12**	**10**	**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 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

Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her. 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. (Affective Domain Outcomes). Each student will have to maintain activity chart consisting of individual contribution in the project work and give a seminar presentation of it before submission. 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:

1. Set up FTP Server and Client on one network. Transfer files from client to server and Vice versa.
2. Set up Telnet Server and Client on one network. Create users in server and access it through client.

12. SUGGESTED LEARNING RESOURCES

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

13. SOFTWARE/LEARNING WEBSITES

1 www.nptel.com
2 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: 1. Smt.B.K.Vyas 2. Smt.A.A.Shaikh (Course Experts)	Sign: Name: Mr. U.V. Kokate Dr.S.B.Nikam (Head of Department) (Department of Computer Engineering)
Sign: Name: Mr. U.V. Kokate Dr.S.B.Nikam (Programme Head) (Department of Computer Engineering)	Sign: Name: Mr. A.S. Zanpure (CDC In-charge)

Government Polytechnic, Pune

'180 OB' – Scheme

Programme	**Diploma in Computer Engineering**
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**
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	
03	01	02	06	Marks	80	20	25	25	150
				Exam Duration	3 Hrs	1 Hr			

Legends: L- Lecture, P- Practical, T- Tutorial, C- Credit, ESE-End Semester Examination, PA- Progressive Assessment (Test I, II/Term Work), *- Practical Exam, $- Oral Exam, #- Online Examination each Lecture/Practical period is of one clock hour

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 UDP socket 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

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 different Layouts manager	1	04
2.	1	Program to design Notepad application by using Menu class.	1	02
3.	2	Program to design a form using basic swing components and use of tabbed panes and scroll panes in Swing.	1, 2	04
4.	2	Program to map Directory tree and Table.	1, 2	02
5.	3	Program to retrieve hostname using methods in InetAddress class, URL and URL Connection class.	3	04
6.	3	Program that demonstrates TCP/IP and UDP based communication between client and server.	3	02
7.	4	Program to make connectivity with database using JDBC API to send queries through JDBC bridge & handle result.	4	02
8.	5	Create a Client/Server application using RMI.	5	02
9.	6	Program to demonstrate the use of HttpServlet as a parameterized Servlet.	6	02
10.	6	Program to send username and password using HTML forms and authenticate the user using	6	02
11.	6	Program to create session using HttpSession class to implement Session tracking using Cookies.	6	02
12.	All	Micro project (Refer point 11 for micro project list)	All COs	04
			Total Hrs.	**32**

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
	Total	**100**

6. 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**.**

Sr. No	Equipment Name with Broad Specifications	Experiment Sr.No.
1.	Computer System with operating System & any latest JDK version to execute “Java” programs,	01 to 12
2.	Notepad	01 to 12
3.	Databases like Oracle, MySQL, MS-access or any other	07 to 12
4.	Apache Tomcat server version 7 or above web server	09 to 12

7. THEORY COMPONENTS

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
Section - I	
Unit- I Abstract Windowing Toolkit (AWT) (Weightage-18, Hrs- 12)	
1a. Enlist various AWT components. 1b. Describe Event Delegation Model. 1c. Describe various handling events by extending AWT 1d. Design a form containing various AWT components and apply event handling.	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 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.
Unit- II Swing Component (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, Tooltips.
Unit - III Networking Basics (Weightage- 12, Hrs-06)	
3a. Define socket. 3b. Compare various sockets. 3c. Write a java program 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.
Section - II	
Unit - IV Java Database Connectivity (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 JDBC Database Example
Unit - V Remote Method Invocation (Weightage- 12, 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.
Unit -VI Servlets (Weightage- 14, Hrs-10)	
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, ServletContex 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
Section -I						
I	Abstract Windowing Toolkit (AWT)	12	06	06	06	18
II	Swing Component	06	02	02	06	10
III	Networking Basics	06	04	02	06	12
	Total	**24**	**12**	**10**	**18**	**40**
Section -II						
IV	Java Database Connectivity (JDBC)	08	04	04	06	14
V	Remote Method Invocation	06	04	04	04	12
VI	Servlets	10	04	04	06	14
	Total	**24**	**12**	**12**	**16**	**40**
Grand Total		**48**	**24**	**22**	**34**	**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 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.
c. With respect to item No.9, teachers need to ensure to create opportunities and provisions for ***co-curricular activities***.
d. Use different Audio-Visual media for Concept understanding.
e. Guide student(s) in undertaking micro-projects.
f. Demonstrate students thoroughly before they start doing the practice.
g. Observe continuously and monitor the performance of students in Lab.

11. SUGGESTED MICRO-PROJECTS

Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her. 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. (Affective Domain Outcomes). Each student will have to maintain activity chart consisting of individual contribution in the project work and give a seminar presentation of it before submission. 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

Sr. No.	Title	Author,	Publisher, Edition and Year of Publication ISBN Number
1	Core Java Volume II	Cay S. Horstmann	Pearson, Edition 10 ISBN :978-9332582712
2	Special edition using java1.2	Joseph L.Weber	Que Pub 4th Edition Sept 1998 ISBN :0789709368
3	The Complete Reference Java 2	Schildt, Herbert,	Mcgraw Hill Education, New Delhi, Fifth Edition ISBN:9789351199250
4	Java 2 Programming Black Book	Holzner, Steven et al.	Dreamtech Press, New Delhi ISBN 10: 817722655X ISBN 13: 9788177226553
5	Java Server Programming Tutorial JAVA EE6 Black Book	Kogent	Learning Solution Dreamtech Press, New Delhi 1.4 Edition ISBN:978-8177226249

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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
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

	PSO1	PSO2
CO1	-	3
CO2	-	2
CO3	-	2
CO4	-	2
CO5	-	3
CO6	-	2

Sign: Name: 1. H. S. Pawar 2. R. J. Chavan 3 S. S. Ingavale (Course Experts)	Sign: Name Mr. U. V. Kokate Dr. S. B. Nikam (Head of the Department) (Department of Computer Engineering)
Sign: Mr. U. V. Kokate Dr. S. B. Nikam (Programme Head) (Department of Computer Engineering)	Sign: Mr. A. S. Zanpure (CDC In-charge)

Government Polytechnic, Pune

'180 OB' – Scheme

Programme	**Diploma in Computer Engineering**
Programme code	01/02/03/04/05/**06**/07/08/15/16/17/18/19/21/22/23/24/**26**
Name of Course	**Computer Security**
Course Code	**CM4110**
Prerequisite course code and name	**NA**
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	
03	00	02	05	Marks	80	20	25	25	150
				Exam Duration	3 Hrs	1 Hr			

Legends: L- Lecture, P- Practical, T- Tutorial, C- Credit, ESE-End Semester Examination, PA- Progressive Assessment (Test I, II/Term Work), *- Practical Exam, $- Oral Exam, #- Online Examination each Lecture/Practical period is of one clock hour

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 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

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1.	1	Study of IT Act and Cyber Laws	1	02
2.	2	Install and configure Antivirus software on system (any).	2	02
3.	2	Practice use of data recovery tools	2	04
4.	3	Write a program to implement any Substitution/Transposition Technique.	3	04
5.	3	Install any Cryptographic tool (For. Eg. Cryptool Software)	3	02
6.	3	Perform various Encryption/Decryption techniques using Cryptographic Tool.	3	04
7.	4	Install and Configure firewall settings on any operating system	4	04
8.	4	Create and verify Digital Certificate using tool (e.g., Cryptool)	4	04
9.	5	Trace the origin of email using any tool (e.g., emailTrackerPro)	5	02
10.	5	Trace the path of web site using Tracert Utility	5	02
11.	All	Micro-project (Refer point 11 for micro project list)	All COs	02
		Total Hrs		**32**

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
	Total	**100**

6. MAJOR EQUIPMENT/ INSTRUMENTSREQUIRED

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	Experiment Sr. 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

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
Unit - I. Introduction to computer security (Weightage -16, Hours-12**)**	
1a. Explain the importance of given pillars of computer security. 1b.Explain the characteristics of given type of threat. 1c.Explain types of attacks related with security.	1.1 Foundations of Computer Security: Definition and Need of computer security, Security basics: Confidentiality, Integrity, Availability, Accountability, Non-repudiation, Reliability, Authentication. 1.2 Risk and Threat Analysis: Assets, Vulnerability, Threats, Risks, Counter measures. 1.3 Threat to Security: Viruses, Phases of Viruses, Types of Virus, Dealing with Viruses, Worms, Trojan horse, Intruders, Insiders, Ransomware. 1.4 Type of attacks: 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.
Unit - II. User Authentication & Access Control (Weightage-14, Hours-08**)**	
2a. Explain how to construct good/strong password) 2b. Explain the given method of Biometric. 2c. Explain Authentication and Authorization with example. 2d. Describe the features of given access control policy.	2.1 Identification and Authentication: User name & Password, Guessing password, Password attacks-Piggybacking, Shoulder surfing, Dumpster diving 2.2 Biometrics: finger prints, hand prints, Retina, patterns, voice patterns, signature and writing patterns, keystrokes. 2.3 Access controls: Definition, Authentication Mechanism, principle Authentication, Authorization, Audit, Policies: DAC, MAC, RBAC 2.4 Social Engineering.
Unit - III. Cryptography (Weightage- 20 , Hours- 12**)**	
3a. Define terms related to cryptography. 3b. Encrypt/Decrypt the given text using different substitution/transposition techniques. 3c. Describe various encryption algorithms 3d. Explain Hashing with properties.	3.1 Introduction: Plain Text and Cipher Text, Cryptography, Cryptanalysis, Cryptology, Encryption, Decryption. 3.2 Substitution techniques: Caesar's cipher, mono alphabetic, poly alphabetic, Vigenere cipher 3.3 Transposition techniques: Rail fence technique, simple columnar, Vernam Cipher (One-Time Pad) 3.4 Steganography: Procedure, Hashing: Definition , Hashing Algorithms: MD-5, SHA 3.5 Symmetric and Asymmetric cryptography: Introduction to Symmetric encryption, DES (Data encryption Standard) algorithm, Asymmetric key cryptography: Digital Signature

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
Unit - IV. Public Key Infrastructure (Weightage-14, Hours- 08**)**	
4a. Explain working of PKI. 4b. Describe Public Key Infrastructure 4c. Describe steps for obtaining digital certificate 4d. Explain digital certificate life cycle	4.1 Public key infrastructures: basics, digital certificates, certificate authorities, registration authorities 4.2 Steps for obtaining a digital certificate 4.3 Trust and certificate verification 4.4 Digital certificates: certificate attributes, certificate extensions 4.5 Certificate life cycles: registration & generations, renewal, revocation, CRL distribution, suspension, key destruction 4.6 Centralized and decentralized infrastructure
Unit - V. System Security & Network Security (Weightage-16, Hours-08**)**	
5a. Explain need of firewalls. 5b. Explain Intrusion Detection system. 5c. Classify IDS techniques. 5d. Explain different ways to implement IP Security 5e. Explain protocols related to Email security	5.1 Firewall: Need of firewall, types of firewall- packet filters, application gateways, circuit gateways 5.2 Kerberos. Intrusion Detection: Network-Based IDS, Host-Based IDS 5.3 Honeypots. 5.6 Operating system security: Operating system updates : hot fix, patch, service pack 5.7 IP security: overview, Protocols- AH, ESP, Modes- transport & Tunnel 5.8 Email security: 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
Total		48	**22**	**32**	**26**	**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 journal of practicals.
b. Use Cryptographic Tools and Utilities.

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.
c. With respect to item No.9, teachers need to ensure to create opportunities and provisions for ***co-curricular activities***.
d. Use different Audio-Visual media for Concept understanding.
e. Guide student(s) in undertaking micro-projects.
f. Demonstrate students thoroughly before they start doing the practice.
g. Observe continuously and monitor the performance of students in Lab.

11. SUGGESTEDMICRO-PROJECTS

Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her. 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. (Affective Domain Outcomes). Each student will have to maintain activity chart consisting of individual contribution in the project work and give a seminar presentation of it before submission. 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. Study of any Real Case of Malware Attacks:
    i. Understand Computer Virus and Malware Attack
    ii. Analyze Phases of Virus
    iii. Study and Analyze any Real Case of Malware Attacks for. eg CryptoLocker , ransomware, 2013, ILOVEYOU, worm, 2000,11. Melissa, virus, 1999 etc

b. Study and Analyze Small Business Cyber security Case Study:
    i. Understand the type of attack,
    ii. Analyze the Response and Impact of the attack

iii. Find Preventive /curative measures against damages by attack

c. Study and analyze Social Site cyber attack case study:
   i. Understand the type of attack,
   ii. Analyze the Response and Impact of the attack
   iii. Find Preventive /curative measures against damages by attack

d. Any other Relevant Case Study of Student's / Faculty's Choice.

12. 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 Mukopadhay	McGraw Hill Technology Education International 2nd Edition • ISBN- 9780070702080.
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

13. SOFTWARE/LEARNING WEBSITES

1. https://www.tutorialspoint.com//computer_security/computer_security_quick_guide.htm
2. https://freevideolectures.com/course/3027/cryptography-and-network-security
3. https://www.tutorialspoint.com/ethical_hacking/ethical_hacking_process.htm
4. https://www.cybrary.it/
5. https://www.tutorialspoint.com/cryptography/index.htm
6. https://www.geeksforgeeks.org/ip-security-ipsec/
7. https://www.open.edu/openlearn/ocw/mod/oucontent/view.php?id=48325&section=1

14. 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 Dr.S.B.Nikam (Head of Department) (Department of Computer Engineering)
Sign: Name: Shri.U. V. Kokate Dr.S.B.Nikam (Programme Head) (Department of Computer Engineering)	Sign: Name: Shri A.S.Zanpure (CDC Incharge)

Government Polytechnic, Pune

'180 OB' – Scheme

Programme	**Diploma in Computer Engineering**
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	**NA**
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	
04	00	02	06	Marks	80	20	25	25	150
				Exam Duration	3 Hrs	1 Hr			

Legends: L- Lecture, P- Practical, T- Tutorial, C- Credit, ESE-End Semester Examination, PA- Progressive Assessment (Test I, II/Term Work), *- Practical Exam, $- Oral Exam, #- Online Examination each Lecture/Practical period is of one clock hour

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

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 and apply different Constraints on relation.	4	4
2.	2	Draw an ER diagram for given database.	3	4
3.	3	Write Queries using various types of operators and Functions	2,4	4
4.	3	Write Queries using different types of clauses and Joins.	4	2
5.	4	Create update and alter View, Sequence and Index.	5	2
6.	3	Design and Develop MongoDB queries using basic operations.	4	2
7.	5	Write the PL/SQL Program using different Control structures and Exceptions handling.	6	2
8.	5	Programs based on Cursors, stored Procedure and Functions.	6	4
9.	6	Write program for creating Various types Triggers.	6	2
10.	6	Creating and deleting users and assign privileges to users.	4	2
11.	ALL	Micro-Project (Refer point 11 for micro project list)	ALL COs	4
		Total Hrs		**32**

Sr.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
Total		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

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
Unit -I Introduction To Database System (Weightage-12 , Hours.- 08)	
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 Mongo DB.	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.
Unit-II Relational Data Model (Weightage- 14, Hours - 10)	
2a. Define table, row, column, domain, attribute, key, strong entity set and weak entity set. 2b. State types of keys and give example of each. 2c. Describe data constraints. 2d. Describe database design in terms of 1NF, 2NF and 3NF. 2e. Describe conceptual design. 2f. Draw an ER diagrams.	2.1 Relational Structure- Tables (Relations), Rows (Tuples), Domains, attributes 2.1 Keys: Super Keys, Candidate Key, Primary Key, Foreign Key. 2.2 Data Constraints: Not Null, Unique, Primary Key, Foreign Key, Check, Default. 2.3 Normalization -Normalization based on functional dependencies, Normal forms: 1NF, 2NF, 3NF. 2.4 Entity Relationship Model, -Strong Entity set, Weak Entity set, Types of Attributes, E-R Diagrams.
Unit – III SQL And NoSQL (Weightage- 14, Hours. - 12)	
3a. Enlist oracle data types. 3b. Compare DDL, DML, DCL and TCL. 3c. Write SQL queries on DDL, DML, DCL and TCL. 3d. Describe clauses and Joins with its types. 3e. Write SQL queries to evaluate use of clauses and joins. 3f. Enlist operators and compare between Relational, Arithmetic, Logical, set operators. 3g. Write SQL queries to evaluate use of operators. 3h. Enlist functions and compare Date, time, String functions and Aggregate Functions. 3i. Write SQL queries to evaluate use of functions. 3j. Compare SQL with NoSQL 3k. Enlist benefits of NoSQL	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). 3.2 Clauses & Join**:** Different types of clauses in SQL. Joins, Types of Joins, Nested queries. 3.3 Operators: Relational, Arithmetic, Logical, set operators. 3.4 Functions: Date and time, String functions, Aggregate Functions. 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.

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

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
Total		**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 practical 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

(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 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. (Affective Domain Outcomes). Each student will have to maintain activity chart consisting of individual contribution in the project work and give a seminar presentation of it before

submission. 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

Sr. No.	Title	Author	Publisher, Edition and Year of publication ISBN Number
1	Introduction to Database system	Abraham Siebrecht, Henry Korth and S. Sudarshan	Tata McGraw Hill, 3rd edition • ISBN 13-978-93-3290-138-4
2	SQL, PLSQL	Ivan Bayross	BPB Publication, 4th edition ,2015 • ISBN 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

Sign: Name: 1.Smt.S.B.Gosavi 2.Smt.R.J.Chavan 3.Mrs. L.S.Korade (Course Experts)	Sign: Name: 1. Mr. U. V. Kokate 2. Dr. S. B. Nikam (Head of Department) (Department of Computer Engineering)
Sign: Name: 1. Mr. U. V. Kokate 2. Dr. S. B. Nikam (Programme Head) (Department of Computer Engineering)	Sign: Name: Mr. A.S.Zanpure (CDC In-charge)