Bansilal Ramnath Agarwal Charitable Trust's

Vishwakarma Institute of Information Technology, Pune-48

Syllabus for

S.Y. M.Tech.

(WATER RESOURCE AND ENVIRONMENTAL ENGINEERING)

Department of Civil Engineering

VISION:

Excellence in Electronics & Telecommunication Engineering Education

MISSION:

Provide excellent blend of theory and practical knowledge. sustainable development of society

Establish centre of excellence in post graduate studies and research.

Prepare engineering professionals with highest ethical values and a sense of responsible citizenship.

Second Year M. Tech. (SYMT) - Semester III (Pattern 2018)

Course Code	Course	Course Type	Teaching Scheme		Examination Scheme					Total	Credits
					Formative Assessment			Summative			
			L	P	ISE		CE	ESE	OR		
					T1	T2					
CVPA211	Elective V	CE	3	-	-	-	50	-	-	50	3
IOEP2118 2	Open Elective	CE	3	-	-	-	50	-	-	50	3
CVPA2118 3	Internship# / Value added course# / In-	CE-OR	-	12	-	-	100	-	100	200	6
CVPA2118 4	Dissertation Phase – I#	CE-OR	-	8	-	-	100	-	100	200	4
	Total		**6**	**20**	**40**	**20**	**300**	**-**	**200**	**500**	**18**

Course code	Elective V	Course code	Open Elective
CVPA21181A	Design of Hydraulic structures	IOEP21182A	Product Design Engineering
CVPA21181B	Computational methods in WRE	IOEP21182B	Ethical Hacking
CVPA21181C	Wave Mechanics	IOEP21182C	Project Planning and Management

Dean Academics
Director

Second Year M. Tech. (SYMT) - Semester IV (Pattern 2018)

Course Code	Course	Course Type	Teaching Scheme		Examination Scheme					Total	Credits
					Formative Assessment			Summative Assessmen			
			L	P	ISE		CE	ESE	OR		
					T1	T2					
CVPA2218 1	Dissertation Phase – II	CE-OR	-	32	-	-	100	-	100	200	16
	Total		**-**	**32**	**-**	**-**	**100**	**-**	**100**	**200**	**16**

Dean Academics
Director

Semester – III

Elective 5A
Design of Hydraulic structures (CVPA21181A)

Teaching Scheme
Credits: 3
Lectures: 3 Hrs/week

Examination Scheme
Formative Assessment: 50 Marks

Prerequisite:

Course Objectives:

To introduce students to the concept of diversion head works
To analyse flow below weir
To impart the knowledge about canal falls along with their deign
To make students aware of different regulation modules and miscellaneous structures along with their design
To introduce students to cross drainage works along with their designs
To introduce students to rivers, their behavior and control

Course Outcomes:

By the end of the course, students will able to

1. Design layout of diversion head works
2. Design of weir on permeable foundations
3. Design canal fall
4. Design canal regulatory modules
5. Design CD works
6. Design river training works

1.

Unit I :Diversion Head works

Weir and Barrage, Gravity and non- gravity weirs, layout of a diversion head works and its components, The diversion weirs and its types, afflux and pond level, the under sluices or scouring sluices, the divide wall, fish ladder, head sluices, silt control devices.

Unit II: Theories of seepage and Design of weri and Barrage

Failure of hydraulic structures founded on pervious foundations. Bligh's Creep theory for seepage flow, Lane's weighted Creep theory, Khosla's theory and concept of flow nets, Design of vertical drop weir on Bligh's theory, Design of modern weirs and barrages founded on permeable foundations on the basis of Khosla's theory.

Unit III :Canal Falls

Definition and location of canal falls, Types of falls, Design of a trapezoidal notch fall, Design of syphon well drop, design of simple vertical drop fall, design of Sarda type fall, design of a straight glacis fall, design of a baffle fall or Inglis fall.

Unit IV : Regulators Modules And Miscellaneous Canal Structures

Canal Regulation- Canal regulation works, canal regulators, alignment of the off taking channels, Distributary head regulator and cross regulator, design of cross regulator and head regulator, Canal escapes - types of canal escapes,

Metering Flumes – Types of Metering Flumes, Canal Outlets or Modules – Requirements of good Module, types of Modules, Criteria for judging the performance of modules, certain other important definitions connected with modules, types of non-modular outlets, types of semi modules or Flexible outlets, types of rigid modules, Miscellaneous Canal Structures – Cattle crossings, bed bars.

Unit V : Cross Drainage Works

Introduction, types of Cross Drainage Works, selection of suitable type of cross drainage work, various types of aqueducts and siphon aqueducts, design consideration for Cross Drainage Works, determination of maximum flood discharge, Fixing waterway requirements for aqueducts and siphon aqueducts. provision of joints and water bars in R.C.C ducts of aqueducts and super passages.

Unit VI: Rivers their behavior, training and control

Importance of rivers and necessity of controlling them, types of rivers and their characteristics, classification of the rivers on the basis of the topography of the river basin, Indian rivers and their classifications, Behavior of rivers, straight reaches, bends, meanders, Control and training of rivers, objective of river training, classification of river training, methods of river training, problems related to the river training.

Text books:

1. S. R. Sahasrabudhe, Irrigation Engineering and hydraulic structures, Catson books, Delhi, 3ed.
2. Garg S. K., Irrigation Engineering and Hydraulic Structures, Khanna Publishers N.D. 13th ed, 1998.
3. Dr. P. N. Modi, Irrigation, Water Resources and water power engineering, Publ Standard book house.

Reference Books :

1. Grishin M. M., Hydraulic Structures, Vol. 1. & Vol. 2, Mir Publishers, Moscow, 1982.
2. Jasapal Singh, M.S.Achrya, Arun Sharma, Water Management, Himanshu Publication Press
3. Asawa G. L., Irrigation and Water Resources Engineering, New Age International (P) Ltd. Publishers, first ed, 2005

Elective 5B
Computational methods in WREE(CVPA21181B)

Teaching Scheme
Credits: 3
Lectures: 3 Hrs/week

Examination Scheme
Formative Assessment:
50 Marks

Prerequisite:

Course Objectives:

1. To introduce students to various computational techniques like statistical methods, numerical methods like Finite difference method and Finite element method
2. To introduce students to advanced computational methods like data driven techniques
3. To introduce students a new field of Hydroinformatics
4. To make students aware of various types Hydraulic engineering software and their applications with case studies

Course Outcomes:

After successfully completing the course the student will be able to

1. Use spread sheet for analysis of data pertaining to water resources and environmental parameters
2. Model various water resources and environmental parameters using statistical techniques
3. Use numerical methods to solve water resources and environmental engineering problems
4. Understand various data driven techniques and their applications in WREE
5. Explore various options for development of Hydroinformtics
6. Use WREE software like HECRAS and know various other software and their applications in WREE

Unit I Introduction

Introduction to computational Techniques, Database design, Spreadsheet, Usefulness in Water Resources Engineering

Unit II Statistical Techniques

Presentation of data, Measures of location and dispersion, Probability concepts and distribution, Tests of significance, Correlation and Regression, Selection of Suitable technique, error analysis

Unit III Numerical Methods

Finite difference schemes – Method of characteristics – Finite element method

Unit IV Advanced Techniques

Genetic algorithm - Artificial Neural Network - Fuzzy logic – Other data driven methods

Unit IV Hydro informatics

Introduction – Virtual institute – Web based hydro informatics system Applications

Unit VI Applications

Application with case studies, Selection of suitable technique, Different types of hydraulic engineering software - Salient features – Capabilities and Limitations

Text Books:

1. Abbott M.B., Hydroinformatics – Information Technology and the Aquatic Environment, Avebury Technical, Aldershot, 1991.
2. Adeli H. and Hung S., Machine Learning – Neural Networks, Genetic Algorithms and Fuzzy Systems, John Wiley, New York, 1995.
3. Chaudhry M.H., Open Channel Flow, Prentice Hall of India Pvt. Ltd., New Delhi, 1994

Reference Books:

1. Grewal B.S., Higher Engineering Mathematics, Khanna Publishers, New Delhi.,2001
2. Govindaraju, R. S. and Rao, A. R. (eds.). Artificial Neural Networks in Hydrology, Kluwer Academic Publishers, Dordrecht, 2000.
3. Rajsekaron S. and Pai G.A. Vijayalakshmi, Neural Networks, Fuzzy Logic and Genetic Algorithams-Synthesis and Applications, PHI Learning Pvt. Ltd., New Delhi, 2010

Elective 5C
Wave Mechanics (CVPA21181C)

Teaching Scheme
Credits: 3
Lectures: 3 Hrs/week

Examination Scheme
Formative Assessment: 50 Marks
Summative Assessment: 00 Marks

Prerequisite:
1. Fundamentals of probability.

Course Objectives:
1. To introduce students the basics of wave hydrodynamics
2. To study various wave theories
3. To learn wave statistics
4. To study wave propagation
5. To understand coastal processes
6. To understand phenomenon of littoral drift

Course Outcomes:
At the end of the course, student will be able to
1. Understand basics of wave hydrodynamics, wave generation, wave decay, wave forecasting
2. Determine various wave parameters using wave theories
3. Engineers with the ability to carry out the calculation of forces acting on structures due to waves
4. Solve problems related to wave propagation
5. Develop the ability to study and analyze wave statistics
6. Understand and analyze coastal processes
7. Calculate the littoral drift

Unit I : Introduction to Wave Mechanics

Introduction, Generation, Decay, Classification, Measurement, Basic hydrodynamic equations, Wave Forecasting: The Significant Wave, Simplified versus Elaborate Technique, Numerical Wave Modelling (introduction only, no mathematical treatment): Phase resolving models, Phase averaging models, Introduction to Wave watch III, SWAN, MIKE

Unit II : Wave Theories

Wave theories - Linear wave theory , Bottom boundary condition, Kinematic free surface boundary conditions, Dynamic free surface boundary conditions, Solution to linear water wave problem, wave length, wave celerity, classification of waves , wave particle velocities, water particle acceleration, water particle displacement, Wave energy: potential and kinetic energy.

Unit III : Wave Propagation

Wave shoaling, wave refraction, wave diffraction, wave reflection, combined effects using numerical solutions, wave breaking, wave set up and set down, wave

runup, radiation stresses.

Unit IV : Wave Statistics

Wave statistics: Short term wave statistics, Tucker method, Long term wave statistics- Gumbel distribution, Weibull Distribution, Log Normal Distribution, Wave spectrum analysis, wave spectra and statistics, Theoretical spectra: Pierson-Muskowitz Spectrum, Bretschneider Spectrum, JONSWAP Spectrum, Scott Spectrum, Scott-Wiegel Spectrum.

Unit V : Coastal Area and Processes

Overview of Coastal Engineering, The Coastal Area, The Beach and Nearshore System, Dynamic Beach Response to the Sea, page, Causes of Shoreline Erosion, Coastal Protection Methods and Navigation Works.

Unit VI : Littoral Processes

Introduction of Littoral process, Littoral Materials, Littoral Wave Conditions, Nearshore Currents, Littoral Transport, Role of Foredunes in Shore Processes, Sediment Budget, Engineering Study of Littoral Processes

Text books :

1. Dean, R. G., Darlymple R. A. (1991). "Water Wave mechanics for Engineers and Scientists", World Scientific Sorensen

2. R. M. (1997). "Basic Coastal Engineering", Springer

3. Mani, J.S., (2012), "Coastal Hydrodynamics", PHI Learning Pvt. Ltd, New Delhi

Reference books :

1. Sarpkaya, T., Issacson, M. (1981). "Mechanics of Wave Induced Forces on Offshore Structures", Van Nostrand Reinhold.

2. Army Corps of Engineers. (2002). "Coastal Engineering Manual", U.S. Army Corps of Engineers, Washington D. C.

3. WMO. (1988), "Guide to Wave Analysis and Forecasting", Pub. NO. 702, World Meteorological Organization, Secretariat of WMO, Geneva

Open Elective A

Product Design Engineering (IOEP21182A)

Teaching Scheme
Credits: 3
Lectures: 3 Hrs/week

Examination Scheme
Formative Assessment: 50 Marks

Course objectives:

1. To understand basic techniques for particular phases of product development
2. Make and manage design teams for product development in a company.

Course Outcomes:

Upon completion of this course, the student will be able to:

1. Describe an engineering design and development process
2. Employ engineering, scientific, and mathematical principles to execute a design from concept to finished product
3. Create 3D solid models of mechanical components from the perspective of aesthetic, ergonomic and functional requirement using CAD software
4. Work collaboratively on a team.
5. Create new product based on mechanical design engineering.
6. Investigate contemporary issues and their impact on provided solution.

Unit 1 – Introduction to Product Design

Characteristics of Successful Product Development, Innovative Thinking, Challenges to Product Development, Product Development Process, Concept Development, Economics – Cost Vs Performance, Design Considerations

Unit 2 – Product Development Process

Product development process- Identification of customer needs- customer requirements, product development process flows. Product specifications and concept generation, concept selection, concept screening, concept testing, reverse engineering, product architecture

Unit 3 –Product Design Tools

Creativity and Problem Solving –Creativity methods-Theory of Inventive Problem

Solving (TRIZ), Product function tree, Life cycle analysis, Quality Function Deployment, Competing Product Analysis, SWOT analysis, Failure Mode Effect Analysis.

Unit 4 – Design for Manufacture and Assembly

Design for assembly, design for disassembly, design for environment, design for graphics and packaging

Unit 5 – Rapid Prototyping

Understanding Prototypes, Principles of Prototyping, Prototyping Technologies, Planning for Prototypes

Unit-6:Product Testing and Validation

Time value of Money, Analytical technique, Product and Process, Evaluation of component, subassembly, assembly, Reliability Goals, Computer simulations and Bench test results, Comprehensive test plans and reports.

Text Books:

1. Product Design-Techniques in Reverse Engineering and New Product Development, Kevin Otto, Kristion Wood, Pearson Education, ISBN 978-81-7758-821-7.
2. Karl T.U. And Steven D.E., Product Design and Development, McGraw Hill, Ed 2000.

Reference Books :

1. Dieter GE, Engineering Design-Material and Processing Approach, McGraw Hill, Ed 2000

Open Elective B

Ethical Hacking (IOEP21182B)

Teaching Scheme
Credits : 3
Lectures : 3 Hrs/week

Examination Scheme
Formative Assessment : 50 Marks
Summative Assessment : NA

Course Objectives :

1. Understand basics of network security and hacking
2. Aware of legal perspective of cybercrime including Indian ITACT 2008
3. Learn techniques of gathering network information
4. Identify security tools including, but not limited to intrusion detection and firewallsoftware
5. Learn to perform different kind of attacks
6. Understand functioning of various protocols

Course Outcomes :

After completion of the course, student will be able to

1. Use basics knowledge of network security and hacking
2. Understand and use the IT Laws as and when required
3. Gather required information to perform a attack
4. Use various tools and methods for Vulnerability Assessment
5. Perform different attacks on Dummy scenario

6. Analyze the use of protocols studied

Introduction to Network and security

Unit I :

Basics of Computer Networks: OSI Model, TCP/IP Model, Network topology (Physical & logical), Network Hardware Components: Connectors, Repeaters, hubs, NICs, Bridges and Switches.

Basics of Computer Networks Security: Essential Terminology, Elements of Information Security, Types of Hackers, Steps for Ethical hacking, Types of Attacks.

Unit II : Legal Perspective

The Indian IT Act, Challenges to Indian law, Cybercrime scenario in India, 2008 amendments to Indian IT Act, Intellectual property in the cyberspace.

Unit III : Information Gathering Techniques

Active information gathering, passiveinformation gathering, Trace route,Interacting with DNS Servers, SNMP and SMTP attacks.

Unit IV : Port Scanning and Vulnerability Assessment

Target Enumeration and Port Scanning Techniques: Scanning for Open Ports and Services, Types of Port Scanning, Firewall/IDS Evading Techniques

Vulnerability Assessment: Vulnerability Scanners and How Do They Work, Pros and Cons of a Vulnerability Scanner, Vulnerability Assessment with Nmap, Nessus

Unit V : Network Sniffing

Introduction, Types of Sniffing, ARP Protocol Basics, ARP Attacks, Denial of Service Attacks, Man in the Middle Attacks.

Unit VI : Remote Exploitation

Understanding Network Protocols: TCP,UDP,ICMP, Server Protocols: FTP,HTTP,SMTP

Text Books :

1. Rafaybaloch, "Ethical hacking and Penetration Testing guide", CRC press, 2015, ISBN: 13: 978-1-4822-3162-5 (eBook - PDF)
2. Nina Godbole, SunitBelapure, "Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", WILEY Publications, 2015, ISBN:978-81-265-2179-1

Reference Books :

1. Behrouz Fourzon, " Data Communication and Computer Networks", Pearson Education,5th edition ISBN : 978-0070634145
2. Andrew S. Tanenbaum, *" Computer Networks",* International Economy Edition, 5th edition ISBN: 10: 9332518742

Open Elective C :
Project Planning and Management(IOEP21182C)

Teaching Scheme
Credits : 3
Lectures : 3Hrs/week

Examination Scheme
Formative Assessment: 50 Marks

Course Objectives:

1. To impart knowledge of project life cycle.
2. To introduce students to Project Identification Process, Project Initiation
3. To understand studies related to Pre-Feasibility Study and Project feasibility Studies.
4. To construct CPM, PERT network for a project.
5. To introduce students to Steps in Risk Management, Risk Identification, Risk

Analysis and Reducing Risks

6. To introduce students to process of project Performance Measurement, Evaluation and closeout.

Course Outcomes:

Upon the completion of the course, students will be able to

1. understand phases of project life cycle
2. understand the Project Identification Process, Project Initiation.
3. Understand Pre-Feasibility Study and Project feasibility Studies of a project.
4. construct CPM, PERT network for a project.
5. understand the concept of Risk Management
6. understand the process of project Performance Measurement, Evaluation and closeout.

Unit I: Basics of Project Management (PM)

Introduction, Need, Project Management Knowledge Areas and Processes, Concept of Organizational Structure and types, The Project Life Cycle (preferably with case study), Essentials PM.

Unit–II:ProjectIdentification and Selection

Introduction, Project Identification Process, Project Initiation, Pre-Feasibility Study, Feasibility Studies, Project Break-even point. Case study is preferred

Unit -III: Project Planning

Introduction, Need for Project Planning, Work Breakdown Structure (WBS), LOB, CPM and PERT, Network Cost System, Resource Allocation, Scheduling, Project Cost Estimate and Budgets.

Unit -IV: Project Risk Management and Quality Management

Introduction, Risk, Risk Management, Role of Risk Management in Overall Project Management, Steps in Risk Management, Risk Identification, Risk Analysis, Reducing Risks. Introduction to Quality, Quality Concepts, Value, Engineering.Case study is preferred.

Unit V: Project Performance Measurement, Evaluation and closeout

Introduction, Performance Measurement, Productivity, Project Performance Evaluation, Benefits and Challenges of Performance Measurement and Evaluation, Controlling the Projects. Project Close-out, Steps for Closing the Project, Project Termination, and Project Follow-up.Case study is preferred

Unit VI - Operation Research in Management

Introduction, Operation Research as tool forDecision Support System, Overview of OR ResearchTechniques, Formulation of Linear Programming Problem, Linear Programming Models, Assumptions of Linear Programming, Graphical Method and Simplex method for solving LP problem.

Students are encouraged to register for On-line course in the relevant above course approved by authority.

Text books:

1. Operations Research by Premkumar Gupta and D.S.Hira, S. Chand Publications (2014)

2. Project Management – K Nagrajan – New age International Ltd.
3. Project Management – Ahuja H.N. – John Wiely, New York.

Internship (CVPA21183)

Teaching Scheme
Credits :6
Practical : 12 Hrs/week

Examination Scheme
Formative Assessment: 100 Marks Summative Assessment (Oral): 100 Marks

Course Objective: Enable students to
1. Apply existing knowledge in similar or new situations
2. Acquire new engineering knowledge and skill
3. Understand importance of life learning processes through internship experiences.

Course Outcomes: Upon completion of an internship, students will be able to
1. Apply the existing engineering knowledge in similar or new situations
2. Have ability to identify when new engineering knowledge is required, and apply it
3. Understand the lifelong learning processes through critical reflection of internshipexperiences.

The preferred duration of an Engineering internship is 3 months, full-time placement with anrelated industry/organization/consultancy work etc.

Continuous Assessment of Performance During Internship:

During the internship semester, the organization with whom the student is undertaking the internship programme conducts periodic assessments of the intern's progress, performance and achievements.

Students are required to submit progress report of internship as per schedule and being in constant touch with the respective Guide. Atleast two presentations and report should be submitted to VIIT, Pune.

In order to ensure that the internship remains meaningful, Guide of the respective student from VIIT, Pune will maintains close contact with organizations/ Industry/Consultancy etc.

Summative Assessment :

After completion of the program, the student submits a detailed report of his internship experience and makes a presentation of the same at VIIT, Pune.

Guidelines for Internship report are mentioned in Annexure I.

Value added course (CVPA21183)

Teaching Scheme
Credits :6
Practical : 12 Hrs/week

Examination Scheme
Formative Assessment:100 Marks
Summative Assessment (Oral): 100 Marks

Course Objectives:

1. Study of new technology in the field of course
2. Understand importance of life learning processes through internship experiences.

Course Outcomes: Upon completion of an internship, students will have

1. Exposure to state of art technology in the respective field of course
2. Have an in-depth knowledge about the subject chosen as value added course.

Following are the list of Value Added Courses offered by VIIT. The duration of Value Added Course is 3 months.

1. **MATLAB: Introduction to MATLAB**
   Basics of MATLAB programming, script files, plotting, Good programming practices, Input and output statements, conditional statements, Loops, Arrays, Array functions, Application in WREE
2. **MIKE-11: Modeling fluid flow using MIKE-11**
   Basics of equations governing MIKE models, working with MIKE 11 user interface, Setting up simulation, Application of MIKE 11 in modeling fluid flow.
3. **HEC-RAS: Modeling fluid flow using HEC-RAS:**
   Basics of HEC-RAS, Building the conceptual model , Mapping the conceptual data to a hydraulic model representation , Running the simulation within HEC-RAS , Viewing results in WMS, Modelling fluid flow using HEC-RAS.
4. **Python Programming Course:** The course aims to teach students the basics of programming computers using Python. The major focus is on basics of how one constructs a program from a series of simple instructions in python.
5. **Analysis using FEA software:** ANSYS Element Selection & Loads: Element Type, 1D, 2D, 3D, Structural and Modal Analysis, Coupled Analysis, Dynamic Analysis.

Value added courses will be carried out in the college and will be done by student/s under the guidance of the Guide/ Course teacher

Continuous Assessment(CE):

Periodic assessment ofthe student progress, performance and achievements will be done through periodic presentations, Assignments, Tests etc. as instructed by the course teacher.

Summative Assessment (SA) :

After completion of the program, the student submits a detailed report of the value added course and its application in the chosen field and makes a presentation.

Guidelines for the report are as suggested in ANNEXURE I

In-house Project (CVPA21183)

Teaching Scheme	**Examination Scheme**
Credits :6	Formative Assessment:100 Marks
Practical : 12 Hrs/week	Summative Assessment (Oral): 100 Marks

Course Objective: Enable students to

1. Identify problem faced by society related to respective engineering field.
2. Collecting information related to the problem same through detailed review of literature.
3. To develop the methodology to solve the identified problem.

Course Outcomes: Upon completion of In house project students will be able to

1. Analyze the findings from the literature.
2. Demonstrate a solution to the problem selected.
3. Demonstrate an ability to present and defend their research work to a panel of experts

Students can take up problems in the field of respective branch of Engineering as In house Projects. It can be related to the solution to an engineering problem, verification and analysis of experimental data available, conducting experiments on various engineering subjects, material characterization, studying a software tool for the solution of an engineering problem etc.

Continuous Assessment (CE):

Periodic assessment ofthe student progress, performance and achievements will be done through periodic presentations, Assignments, Tests etc. as instructed by the course teacher/ Guide. Continuous assessment (CA): will be monitored by the respective Guide.

Summative Assessment (SA):

After completion of the program, the student submits a Project report of his/her In-house project and makes a presentation of the same at VIIT, Pune.

Guidelines for the report are as suggested in ANNEXURE I

Project Stage I (CVPA21184)

Teaching Scheme
Credits: 6
Lectures: --
Laboratory Work: 8Hrs/week

Examination Scheme
Formative Assessment:100 Marks
Summative Assessment (Oral): 100 Marks

Course Objectives:

1. To identify a specific problem for the current need of the society and collecting information related to the same through detailed review of literature.
2. To develop the methodology to solve the identified problem.
3. To train the students in preparing project reports and to face reviews and viva - voce examination.

Course Outcomes:

By the end of the course, students will be able to

1. Analyze the collected literature.
2. Define a methodology to arrive at a solution
4. Demonstrate the literature findings and methodology effectively through viva-voce examination.

The project work will start in semester III, and should preferably be a live problem in the industry or
macro-issue having a bearing on performance of industry and should involve scientific research, design, collection, and analysis of data, determining solutions and must preferably bring out the individuals contribution.

ıContinuousAssessment Method (CA):

Project stage I will have scheduled presentations and assessment. Continuous essment(CA): will be monitored by the respective Guide.

nmative Assessment (SA) :

The dissertation stage I report should be presented in a standard format, in a spiral bound hard copy,
preferably printed on both the sides of paper ,containing the following contents.
i. Introduction including objectives, limitations of study.
ii. Literature Survey, background to the research.
iii. Problem statement and methodology of work
iv. Theoretical contents associated with topic of research
v. Field Applications, case studies
vi. Data collection from field/organizations or details of experimental work/analytical work
vii. Part analysis / inferences
viii. Details of remaining work to be completed during the project work stage II
ix. References

Students should prepare a power point presentation to be delivered in 25 minutes and should be able to
answer questions asked in remaining five minutes

The student shall submit the report of project work completed partly in standard format discussed in Annexure II.

AP2: Audit course

Any one from the following audit courses can be taken by students for a minimum duration of 2 weeks. An approval of the course content should be taken from the Guide/PG Coordinator and HOD.

1. Cyber security
2. Value Engineering and human rights
3. Legislative procedures
4. Technical writing / Documentation
5. Languages
6. Online Certification Courses (minimum 2 weeks)
7. Cost Accountancy
8. Department Specific Audit Courses.

Semester – IV

Project Stage II (CVPA22181)

Teaching Scheme
Credits: 16
Lectures:
Laboratory Work: 32Hrs/week

Examination Scheme
Formative Assessment:100 MarksSummative Assessment (Oral): 100 Marks

Course Objectives:

1. Considerably more in-depth knowledge of the major subject/field of study, including deeper insight into current research and development work.
2. The capability to clearly present and discuss the conclusions as well as the knowledge and arguments that form the basis for these findings in written and spoken English.

Course Outcomes:
By the end of the course,

1. Demonstrate a depth of knowledge in the respective specialization.

2. Demonstrate an ability to present and defend their research work to a panel of experts.

Continuous Assessment Method (CA):

Project stage II will have scheduled presentations and assessment which will be assessed by jointly by the pair of internal and external examiners, along with oral examination of the same. Continuous assessment(CA): will be monitored by the respective Guide.

Summative Assessment (SA) :

The final dissertation should be submitted in black bound hard copy preferably typed on both the sides of paper as well as a soft copy on CD. The format for dissertation is attached in Annexure III and Annexure IV.

Refer guidelines for Thesis submission below.

(The due weight will be given for the paper(s) on topic of project presented in conference/s or published in referred journals.)

A viva –voce for Project Stage II will be the SA.

Course coordinator

ANNEXURE I

Bansilal Ramnath Agarwal Charitable Trust's
Vishwakarma Institute Of Information Technology
(An Autonomous Institute affiliated to Savitribai Phule Pune University)

Department of .....

(Internship/Value Added course/In House) Report on

(Title)

By:

(Name)----------

(Roll No)----------

Semester I/II/III

For the partial fulfillment of M.Tech. degree in (branch)

Of

Under guidance of

(Name of Guide/ Company)

20 - 20

Bansilal Ramnath Agarwal Charitable Trust's
Vishwakarma Institute Of Information Technology
(An Autonomous Institute affiliated to Savitribai Phule Pune University)

Department of .....

CERTIFICATE

This is to certify that the Internship/Value added course/Inhouse Report entitled "_____

_____" is submitted by ---------- ----- bearing Roll No ---------- for the partial fulfillment of M.Tech. (branch name) degree in (Specialization name) of Savitribai Phule Pune University, Pune.

Guide Guide

Head of Department **Director**

External Examiner

Guidelines for Internship reportwriting :

No. of copies required are **Three spiral bound.** (One each for guide, Department and student)

Insert page numbers: bottom center 11 Times New Roman

1. Use MS-word: for typing the paper in A-4 size paper
2. Margins: left, right, top, bottom 25 mm.
3. Spacing: single line spacing
4. Font type: Times new roman
5. Font size:
   14 for the title (Bold)
   12 for Author name (Bold, Title case)

12 bold for caption of Figures and Tables
Main heading: Bold, all caps
Subheading: Bold, Title case
Lower level heading: Bold
10 for Abstract and abstract heading

6. Title page:

Title: all caps, bold and centered, Make sure the title is not more than 80 characters in length, including space between the words.

Abstract: should be between 100 to 150 words

7. Heading and Text:

Left justified bold,
No numbering of main and subheadings,
leave one line blank before and after heading
No underlines or foot notes
Each paragraph should be separated by one blank line

8. Equations:

Use equation editor
Typed and numbered in sequence
Write equation numbers in bracket, right justified

9. Figures and Tables:

Centered and numbered in sequence
The caption of Figure should be below and centered
The caption of Table should be above and centered

10. Reference:

Each reference should be cited in the text by the last name of the author(s) and year of publication of the reference
Reference should include year of publication, full title, name of source, volume, and page numbers. Format of reference should be IEEE/ASCE etc.

ANNEXURE II

Bansilal Ramnath Agarwal Charitable Trust's
Vishwakarma Institute Of Information Technology
(An Autonomous Institute affiliated to Savitribai Phule Pune University)

Department of .....

A

PROJECT REPORT

On

(NAME OF PROJECT)

Submitted to

Savitribai Phule Pune University, Pune

For the partial fulfillment of M.Tech. degree in (branch)

By

(Name of candidate)

University seat No)

Under the Guidance of

(Name of Guide)

20 - 20

Bansilal Ramnath Agarwal Charitable Trust's
Vishwakarma Institute Of Information Technology
(An Autonomous Institute affiliated to Savitribai Phule Pune University)

Department of .....

CERTIFICATE

This is to certify that the Project Report entitled "_____ _____" is

submitted by ---------- bearing Roll No ---------- for the partial fulfillment of M.Tech. (branch name) degree in (Specialization name) of Savitribai Phule Pune University, Pune.

Guide Guide

Head of Department **Director**

External Examiner

Guidelines for Project report writing:

GUIDELINES FOR THESIS SUBMISSION

Vishwakarma Institute of Information Technology, Pune

1. INTRODUCTION

Purpose:

This document, herein after referred to as the Thesis Guide, lists the general and specific requirements governing thesis preparation including guidelines for structuring the contents.

2. Specifications for thesis format:

2.1 Preparation of Manuscript and Copies:

The thesis needs to be prepared using a standard text processing software and must be printed in black text (color for images, if necessary)

The thesis must be printed or photocopied on both sides of white paper. All copies of thesis pages must be clear, sharp and even, with uniform size and uniformly spaced characters, lines and margins on every page

Thesis should be free from typographical errors.

2.2 Sizes and Margins:

A-4 size paper should be used
Margins: left, right, top, bottom 25 mm.
Content should not extend beyond the bottom margin except for completing a footnote, last line of chapter/subdivision, or figure/table caption.
A sub-head at the bottom of the page should have at least two full lines of content below it. If the sub-head is too short to allow this, it should begin on the next page.

2.3 Page Numbering:

Beginning with the first page of the text in the thesis (chapter 1), all pages should be numbered consecutively and consistently.

Page numbers prior to Chapter 1 should be in lower case Roman numerals. The title page is considered to be page (i) but the number is not printed.

Insert page numbers: bottom center 11 Times New Roman

2.4 Line Spacing

Line spacing in the text should be single and double spacing in Abstract.

2.5 Font:

For the thesis the font should be Times new roman with
Font size:

14 for the chapter title (Bold)
12 Times new roman for text in thesis
12 bold for caption of Figures and Tables
Main headinge.g 1.1 : Bold, all caps, 12 Times new Roman
Subheadinge.g 1.1.1 : Bold, Title case, 12 Times new Roman
Lower level heading e.g 1.1.1.1: 12 Times new Roman
12 for Abstract and abstract heading

3.TITLE PAGE

Title: all caps, bold and centered, Make sure the title is not more than 80 characters in length, including space between the words. Refer Annexure I for the format

4. TABLES, FIGURES AND EQUATIONS

All tables (tabulated data) and figures (charts, graphs, maps, images, diagrams, etc.) should be prepared, wherever possible, on the same paper used to type the text and conform to the specifications as specified here:

The caption of Figure should be below and centered, Times New Roman, 12, bold.

The caption of Table should be above and centered, Times New Roman, 12, bold.

Figures used in the report should not be blur.Candidate should try to draw the figures on their own. 8.All the figures and tables should be mentioned/referred/explained in the adjoining paragraphs.

Tables, figures and equations should be numbered sequentially either throughout the thesis or chapter-wise. They are referred to in the body of the text capitalizing the first letter of the word and number, as for instance, Table 17, Figure 24, Equation (33), or Table 5.3, Figure 3.11, Equation (4.16), etc.

Use equation editor

Good quality Line Drawings/figures must be drawn

5. GUIDELINES FOR STRUCTURING CONTENTS:

5.1 Sequence of Contents:

The following sequence for the thesis organization should be followed:

(i) Preliminaries Title Page) As per the format given in Annexure I
Certificate) at the end of the Thesis in Annexure II
Abstract/Synopsis) Guide
Acknowledgement and/ or Dedication (where included)
Table of Contents
List of Figures, Tables, Illustrations, Symbols, etc. (wherever applicable)

(ii) Text of Thesis Introduction
The body of the thesis, summary and conclusions

(iii) Reference Material List of References, Bibliography (where included)

(iv) Appendices where included

(v) Index where included

6. SYNOPSIS/ABSTRACT

An M Tech. thesis should contain an abstract not exceeding 300 words. A synopsis/abstract shall be printed in double space with the heading "SYNOPSIS/ABSTRACT" in uppercase followed by certain preliminary information and the text.

Synopsis/Abstract should be self-complete and contain no citations.

7. TABLE OF CONTENTS

The table of contents lists all material that follows it. Chapter titles, sections, first and second order sub-divisions, etc must be listed in it.

Tables, figures, nomenclature, if used in the thesis, are listed under separate headings.

8. THE TEXT OF THE THESIS

Introduction

Introduction: the first chapter may be the first chapter or its first major division. In either case, it should contain a brief statement of the problem investigated. It should outline the scope, aim, general character of the work carried out.

The body of Thesis

This is the substance of the dissertation inclusive of all divisions, subdivisions, tables, figures, etc.

Summary and conclusions

If required, these are given as the last major division (chapter) of the text. A further and final subdivision titled "*Scope* for Further Work" may follow.

9. REFERENCE

For referencing an article in a scientific journal the following information should be present in a decided format: authors, title, name of journal, volume number, page numbers and year.

For referencing an article published in a book, the decided referencing format should contain authors, the title of the book, editors, publisher, year, page number of the article in the book being referred to.

For referencing a thesis the decided format should contain, author, the title of thesis, where thesis

was submitted or awarded, year.

Each reference should be cited in the text by the last name of the author(s) and year of publication of the reference

Reference should include year of publication, full title, name of source, volume, and page numbers.

Format of reference should be IEEE/ASCE etc.

All the mentioned references should be cited in the report compulsorily

10. APPENDIX OR APPENDICES

Supplementary illustrative material, original data, and quotations too lengthy for inclusion in the text or which is not immediately essential to an understanding of the subject can be presented in Appendix or Appendices (as Appendix A , Appendix B, etc.)

Each appendix with its title should be listed separately in the table of contents. Likewise,tables and figures contained in the Appendices are to be included in the lists of tables and figures, respectively.

11.BINDING

The student should submit the copies of the thesis in partially bound form (coiled wire binding, clamping, or filing) for M.Tech (pre thesis), respectively. Once

thethesis is accepted, it is the student's responsibility to get it properly bound before depositing therequired number of copies with the Department concerned. The frontcover of the bound copy should be the same as the title page of the thesis. The front cover shouldhave printing on the side to include the author's name, abbreviated thesis title (optional), degree,department, and the year.**The thesis should be bound in BLACK colored hard cover (Final Thesis) and golden print (engrossed) with written materials in black script on the title page of the report.**

12.PLAGIARISM REPORT

A plagiarism report (generated through the plagiarism check software) should be submitted with the Project thesis/report with similarity not more than20..%.

13.THESIS SUBMISSION

To have the thesis examined, the number of thesis copies to be submitted to the Dean Academic
should correspond to the number of examiners, Guide, Department and Student. Hard copy of the report is to be submitted to the Department after corrections done as suggested by external examiner/ Guide/Department at any time when report submission is called by Guide/Department.

14.REQUIREMENTS OF THESIS SUBMISSION

A student should submit the following documents during submission of Thesis

1. Thesis hard copy and soft copy (in CD) with related documents
2. Plagiarism Report (Generated through plagiarism check software)
3. No Objection Certificate
4. List of examiners – To be submitted by Guide
5. Duly signed Students Checklist

Statement of Thesis Preparation

1. Thesis title: .....
2. Degree for which the thesis is submitted: .....
3. Thesis Guide was referred to for preparing the thesis.
4. Specifications regarding thesis format have been closely followed.
5. The contents of the thesis have been organized based on the guidelines.
6. The thesis has been prepared without resorting to plagiarism.
7. All sources used have been cited appropriately.
8. The thesis has not been submitted elsewhere for a degree.

(Signature of the student)

Name:

Roll No.:

Department/IDP:

ANNEXURE III

Bansilal Ramnath Agarwal Charitable Trust's
Vishwakarma Institute Of Information Technology
(An Autonomous Institute affiliated to Savitribai Phule Pune University)

Department of .....

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On

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ANNEXURE IV

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Guide Guide

Head of Department **Director**

External Examiner