# D Y Patil College of Engineering, Akurdi, Pune

An Autonomous Institute from AY 2024-25, Affiliated to Savitribai Phule Pune University, Pune

**Department of Electronics and Telecommunication**

## SY M Tech VLSI and Embedded Systems, Semester III

### Syllabus Structure

| Course Code | Course | Teaching Scheme | | | | Evaluation Scheme | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | T | P | Cr | Exam | Theory % Marks | | Practical % Marks | |
| | | | | | | | Max | Min for Pass | Max | Min for Pass |
| VES2411P01 | Dissertation Phase I | 0 | 0 | 8 | 4 | CCA | - | - | 100 | 40 |
| VES2411P02 | Dissertation Phase II | 0 | 0 | 8 | 4 | CCA | - | - | 50 | 40 |
| | | | | | | ESE | - | - | 50 | |
| XXX2411L01 | Open Elective | 4 | 0 | 0 | 4 | CCA | 50 | 20 / 40 | - | - |
| | | | | | | ESE | 50 | 20 / 40 | - | - |
| VES2411P03 | On Job Training/Internship | 0 | 0 | 20 | 10 | CCA | - | - | 100 | 40 |
| **Total** | | **4** | **0** | **36** | **22** | | | | | |

| Course Code | Open Elective |
|---|---|
| MDE2411L01 | 3 D Printing |
| CME2411L01 | Soft Computing |
| CTM2411L01 | Project Management & Finance |
| ENE2411L01 | Environment and Sustainability |
| RNA2411L01 | Robotics & Automation |
| VES2411L01 | Optimization Techniques |

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**Department of Electronics and Telecommunication**

## SY M Tech VLSI and Embedded Systems, Semester III

**Category: Dissertation Phase**

**Course Code:** VES2411P01 **Course Title: Dissertation Phase I**

| Teaching Scheme | | | | Evaluation Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L | T | P | Cr | Exam | Theory % Marks | | | Practical % Marks | |
| | | | | | Max | Min for Pass | | Max | Min for Pass |
| 0 | 0 | 8 | 4 | CCA | - | - | - | 100 | 40 |
| 0 | 0 | 104 | Total: 104 | ESE | - | | | | |

| | |
|---|---|
| **Prerequisites:** Completion of all 4 semesters | |
| **Course Objectives:** | |
| To prepare the synopsis of the dissertation | |
| **Course Outcome:** After successful completion of the course the student will be able to | |
| CO1 | Construct the Synopsis on the Dissertation topic considering Statement of Problem, Significance, Objective, Hypothesis and Methodology. |
| CO2 | Demonstrate the Synopsis on the Dissertation topic with Classified Literature Review, Rationale, Research Question, Time Frame, Budget and References. |

## Syllabus

| Unit I | Synopsis Submission | 70 hrs |
|---|---|---|

1. Introduction (1 Page): Provide a brief overview of the theories and models relevant to your topic.
2. Literature Review (2-4 pages): Summarize relevant and related research in classified way
3. Statement of the Problem (1 Page): Identify research gaps based on the Literature Review and justify the conduct of the study
4. Significance/Rationale (1/2 Page): Explain the importance and contribution of the findings
5. Objectives: List the objectives (min 4) (1/2 page)
6. Hypotheses/Research Questions: State your expectations from the dissertation (1/2 page)
7. Methodology: Specify whether the project is Experimental, Theoretical/Mathematical Modelling, Survey based, or a combination, Design of Experiment (DoE), Describe the strategy and framework proposed, Indicate if the approach is quantitative, qualitative, or mixed methods. (1 Page)

## SY M Tech VLSI and Embedded Systems, Semester III

| | | |
|---|---|---|
| 8. Time Frame of Dissertation: Provide timeline of the work<br>9. Budget: Provide Budget (if required)<br>10. List of References | | |
| **Unit II** | **Submission of Synopsis and its Presentation** | **30hrs** |
| Student is required to present his/her synopsis in front of Committee of the Department | | |

### Rubrics for Continuous Evaluation

| **Rubrics for CCA (100)** | | |
|---|---|---|
| **No** | **Component** | **Marks** |
| 1 | Complete Submission of Synopsis in hard copy of 5 sets | 70 |
| 2 | Seminar presentation on Synopsis | 30 |

### CO-PO Mapping

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 3 | 2 | 3 | 2 |
| **CO2** | 3 | 3 | 3 | 2 | 3 | 2 |

3: High, 2: Moderate, 1: Low, 0: No Mapping

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# D Y Patil College of Engineering, Akurdi, Pune

An Autonomous Institute from AY 2024-25, Affiliated to Savitribai Phule Pune University, Pune

**Department of Electronics and Telecommunication**

## SY M Tech VLSI and Embedded Systems, Semester III

**Category: Dissertation Phase**

**Course Code:** VES2411P02 **Course Title: Dissertation Phase II**

| Teaching Scheme | | | | Evaluation Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L | T | P | Cr | Exam | Theory % Marks | | | Practical % Marks | |
| | | | | | Max | Min for Pass | | Max | Min for Pass |
| 0 | 0 | 8 | 4 | CCA | - | - | - | 50 | 40 |
| - | 0 | 104 | Total: 104 | ESE | - | | | 50 | |

| | |
|---|---|
| **Prerequisites:** Submission of Synopsis | |
| **Course Objectives:** | |
| To present the dissertation work | |
| **Course Outcome:** After successful completion of the course the student will be able to | |
| CO1 | Construct the Synopsis on the Dissertation topic considering Statement of Problem, Significance, Objective, Hypothesis and Methodology. |
| CO2 | Demonstrate the Synopsis on the Dissertation topic with Classified Literature Review, Rationale, Research Question, Time Frame, Budget and References. |

### Syllabus

| Unit I | Submission of Report | 70 hrs |
|---|---|---|

1. Introduction
2. Literature Review
3. Statement of the Problem
4. Significance/Rationale
5. Objectives
6. Hypotheses/Research Questions
7. Methodology
8. Results and Discussions
9. Summary of Objectives Completed (50 % should complete)
10. List of References

| Unit II | Submission of Report and its Presentation | 30 hrs |
|---|---|---|

Student is required to present his/her work in front of Internal and External Committee of the Department

# D Y Patil College of Engineering, Akurdi, Pune

An Autonomous Institute from AY 2024-25, Affiliated to Savitribai Phule Pune University, Pune

**Department of Electronics and Telecommunication**

## SY M Tech VLSI and Embedded Systems, Semester III

## Rubrics for Continuous Evaluation

| Rubrics for CCA and ESE (100) | | |
|---|---|---|
| **No** | **Component** | **Marks** |
| 1 | Complete Submission of Report in hard copy | 70 |
| 2 | Presentation on the work in front of Internal and External Committee appointed by Department. | 30 |

## CO-PO Mapping

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 3 | 2 | 3 | 2 |
| **CO2** | 3 | 3 | 3 | 2 | 3 | 2 |

3: High, 2: Moderate, 1: Low, 0: No Mapping

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# D Y Patil College of Engineering, Akurdi, Pune

An Autonomous Institute from AY 2024-25, Affiliated to Savitribai Phule Pune University, Pune

**Department of Electronics and Telecommunication**

## SY M Tech VLSI and Embedded Systems, Semester III

**Category: Open Elective**

**Course Code: VES2411L01** **Course Title: Optimization Techniques**

| Teaching Scheme | | | | Evaluation Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L | T | P | Cr | Exam | Theory % Marks | | | Practical % Marks | |
| | | | | | Max | Min for Pass | | Max | Min for Pass |
| 3 | 1 | 0 | 4 | CCA | 50 | 20 | 40 | - | - |
| Total Hours | | | | | | | | | |
| 39 | 13 | 0 | Total: 52 | ESE | 50 | 20 | | | |

**Prerequisites:** linear algebra, vector calculus, ordinary differential equations, and Probability

**Course Objectives:**

1. To comprehend, anticipate, and formulate the design problem using mathematical Modeling.
2. To search for solutions to reach the best objective under certain constraints in all Engineering areas.
3. To maximize or minimize the numerical value for optimizing operations (objective function) with some linear and non-linear constraints.
4. To optimize a problem iteratively trying to improve a candidate solution with regard to a given measure of quality.

**Course Outcomes:** After successful completion of the course the student will be able to:

| | |
|---|---|
| CO1 | Formulate the design problem using mathematical Modeling. |
| CO2 | Search for solutions to reach the best objective under certain constraints in all Engineering areas. |
| CO3 | Compute the linear and non-linear programming through various optimization techniques. |
| CO4 | Analyze and appreciate variety of performance measures for various optimization problems. |
| CO5 | Formulate and design topology and Evolutionary based Structural Optimization to get optimum structural shape and layout. |

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**Department of Electronics and Telecommunication**

## SY M Tech VLSI and Embedded Systems, Semester III

## Syllabus

| | | |
|---|---|---|
| **Unit I** | **Title: Introduction to Mathematical Modeling** | **7 hrs** |
| Introduction to Mathematical Modeling, Types of Modeling. Objective function; Constraints and Constraint surface; Mathematical modeling characteristics and limitations, Formulation of design problems**.** | | |
| **Unit II** | **Title: Classical Optimization Techniques** | **8 hrs** |
| Engineering applications of optimization, classification of optimization problem, single variable optimization, multi variable optimization with no constraint, equality constraint, in-equality constraint | | |
| **Unit III** | **Title: Linear and Non-Linear Programming** | **8 hrs** |
| Simplex algorithm, two phases of the simplex method, Primal-dual simplex method, Sensitivity or post optimality analysis, applications in engineering.<br>One-dimensional minimization - exhaustive search, golden section method, quasi-newton method, random search methods, Powell's method | | |
| **Unit IV** | **Title: Modern Methods of Optimization** | **8 hrs** |
| Genetic algorithms, Simulated Annealing, Particle Swarm Optimization, Ant Colony Optimization, Teaching Learning Based Optimization, Introduction to ANN | | |
| **Unit V** | **Title: Topology and Evolutionary Structural Optimization** | **8 hrs** |
| Problem formulation and parameterization of design, solution methods, topology optimization as a design tool, combining topology and shape design, ESO Based on Stress Level, evolutionary methods, two-bar frame, Michell type structure, ESO for stiffness or displacement optimization | | |
| **Reference Books** | | |
| 1. Structural Optimization, Raphael T. Haftka and Zafer Gurdal, Kluwer Academic Publishers<br>2. Practical Optimization Methods with Mathematical Applications, M. Asghar Bhatti, Springer<br>3. Topology Optimization – Theory, Methods and Applications, M. P. Bendse, Q. Sigmund<br>4. Evolutionary Topology Optimization of Continuum Structures, Methods and Applications, X. Huang, Y.M. Xie, Wiley, 2010 | | |

5. Engineering Optimization: Theory and Practice, Singiresu S. Rao, John Wiley & Sons

6. Mathematical Modelling, J N Kapur, New age international publication

7. Optimization for engineering design, K. Deb, PHI

8. Optimization concepts and applications in engineering, Belegundu, Chandrupatla, Pearson Education.


## Tutorial

| Unit I | Title: Introduction to Mathematical Modeling | 3 hrs |
|---|---|---|

Q.1 **Formulation of Design Problems Using Mathematical Models**

Given a manufacturing company is looking to optimize its production process for maximum profit. The company produces two products, **A** and **B**, using limited resources. The production of each product requires time on two machines, Machine 1 and Machine 2. The time required for each product on both machines, along with the available machine hours, is as follows:

| Product | Machine 1 (hours) | Machine 2 (hours) | Profit per unit |
|---|---|---|---|
| A | 3 | 4 | 40 |
| B | 2 | 3 | 30 |

The available hours for Machine 1 and Machine 2 are 24 hours and 18 hours per day, respectively.

**(a) Formulate the problem as a mathematical optimization model.**

- Define the decision variables.
- Write the objective function to maximize the total profit.
- Write the constraints on the availability of machine hours.
- Discuss the characteristics and limitations of this mathematical model.

Q.2 **Understanding Objective Functions, Constraints, and Modeling Characteristics**

Consider a problem where an agricultural company is determining the optimal mix of two types of fertilizers, **F1** and **F2**, to maximize crop yield. Each type of fertilizer provides a different increase in yield per hectare, but they also require a limited budget and land availability. The characteristics of the fertilizers are as follows:

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| Fertilizer | Yield per hectare (kg) | Cost per hectare (USD) |
|---|---|---|
| F1 | 200 | 50 |
| F2 | 300 | 60 |

The company has a total budget of 3,000 USD and 20 hectares of land available for fertilizer application.

**(a) Write the mathematical model for this optimization problem.**

- Define the decision variables.
- Write the objective function to maximize the crop yield.
- Write the constraints based on the budget and land availability.

**(b) Explain how the objective function and constraints affect the formulation of this mathematical model. Discuss the modeling characteristics (such as linearity, convexity, etc.) and limitations (e.g., assumptions about uniformity in yield and costs) in the context of this problem.**

| **Unit II** | **Title: Classical Optimization Techniques** | **3 hrs** |
|---|---|---|

Q.1 **Single Variable Optimization (No Constraints)**

An engineer is designing a cylindrical tank and wants to minimize the surface area for a given volume. The volume of the tank is fixed at 1000 cubic meters. The surface area AAA of a cylinder is given by:

$$A = 2\pi r^2 + 2\pi rh$$

where $r$ is the radius and $h$ is the height of the cylinder. Using the constraint $V = \pi r^2 h = 1000$, express the surface area as a function of $r$ only and find the value of $r$ that minimizes the surface area.

**(a) Derive the surface area function in terms of r.**

**(b) Find the radius r that minimizes the surface area.**

Q.2 **Multi-variable Optimization with No Constraints**

An engineer is designing a box with a square base and open top. The material used for the box costs $2 per square meter for the base and $1 per square meter for the sides. Let the side length of the square base be xxx meters and the height of the box be h meters. The volume of the box must be 100 cubic meters.

**(a) Express the cost function for the material as a function of x and h.**

**(b) Use the volume constraint V=x2h=100 to eliminate h and find the cost function in terms of x alone.**

**(c) Find the value of x that minimizes the cost of material.**

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**Department of Electronics and Telecommunication**

**SY M Tech VLSI and Embedded Systems, Semester III**

| **Unit III** | **Title: Linear and Non-Linear Programming** | **3 hrs** |
|---|---|---|

Q.1 **Linear Programming and Simplex Method**

A company manufactures two products, **P1** and **P2**, which require two types of resources: **R1** and **R2**. The resource availability and requirements are as follows:

| Resource | Product P1 (units) | Product P2 (units) | Availability |
|---|---|---|---|
| R1 | 3 | 2 | 12 |
| R2 | 4 | 3 | 18 |

The profit per unit of **P1** is $4, and the profit per unit of **P2** is $5.

**(a) Formulate the problem as a linear programming problem.**

- Define the decision variables.
- Write the objective function to maximize profit.
- Write the constraints based on the resource limitations.

**(b) Solve the linear programming problem using the Simplex method.**

- Set up the initial simplex tableau.
- Apply the two-phase simplex method if necessary.
- Find the optimal solution and interpret the results.

**(c) Discuss the applications of sensitivity analysis in this problem. How would changes in the availability of resources (R1 or R2) affect the optimal solution?**

Q.2 **Non-Linear Programming and One-Dimensional Minimization**

An engineer is optimizing the temperature of a heat treatment process, where the time-dependent temperature T(t) is modeled as a non-linear function of time. The temperature is given by:

$$T(t) = t^2 - 6t + 11$$

The engineer wants to minimize the temperature function over the time interval $t \in [0,5]$.

**(a) Use the Golden Section Method to find the minimum temperature in the given interval.**

- Explain the steps involved in the Golden Section method.
- Perform the necessary calculations to find the minimum point.

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**(b) Discuss the application of Quasi-Newton methods in solving non-linear optimization problems like the temperature optimization. What advantages do these methods have over traditional methods like exhaustive search?**

**(c) Explain how the Powell's method could be applied to a multi-variable optimization problem in an engineering design context, and discuss its potential benefits compared to gradient-based methods.**

| | | |
|---|---|---|
| **Unit IV** | **Title: Modern Methods of Optimization** | **2 hrs** |

Q.1 **Genetic Algorithms and Simulated Annealing**

You are tasked with optimizing the design of a mechanical component to minimize the material usage while adhering to certain constraints (e.g., weight, strength). The objective function and constraints are complex, and traditional methods are not effective.

**(a) Briefly explain how Genetic Algorithms (GA) can be used to solve this optimization problem. Highlight the key components of a GA (such as selection, crossover, and mutation).**

**(b) Compare Simulated Annealing (SA) with Genetic Algorithms (GA) in terms of their working principles and suitability for solving optimization problems with complex objective functions.**

Q.2 **Particle Swarm Optimization and Ant Colony Optimization**

A civil engineering company is looking to optimize the layout of an urban road network to minimize congestion while considering traffic flow, safety, and construction costs.

**(a) Explain the basic concept of Particle Swarm Optimization (PSO). How can PSO be applied to optimize the layout of road networks?**

**(b) Describe how Ant Colony Optimization (ACO) can be applied to solve optimization problems in transportation or logistics. Provide an example of its potential application in an engineering context.**

| | | |
|---|---|---|
| **Unit V** | **Title: Topology and Evolutionary Structural Optimization** | **2 hrs** |

Q.1 **Topology Optimization and Design Parameterization**

You are tasked with optimizing the design of a **two-bar frame** structure to minimize its weight while maintaining structural strength. The design is parameterized using the cross-sectional areas of the bars.

**(a) Explain how Topology Optimization can be used to determine the optimal distribution of material in the two-bar frame. What are the key steps involved in the optimization process?**

**(b) Discuss how evolutionary methods can be applied to improve the design further, particularly when considering constraints on displacement and stress levels.**

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Q. 2 **ESO and Structural Optimization**

A mechanical engineer is using **Evolutionary Structural Optimization (ESO)** for stiffness optimization in a structure. The engineer aims to reduce the structure's material usage while ensuring that the stiffness is above a certain threshold.

**(a) Describe the basic working principle of ESO based on stress level. How does this method help in removing inefficient material from the structure?**

**(b) Explain the concept of Michell-type structures and discuss how ESO can be applied to optimize such structures for stiffness or displacement.**

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**Department of Electronics and Telecommunication**

## SY M Tech VLSI and Embedded Systems, Semester III

### Rubrics for Continuous Evaluation

| Component | Level | Unit 1 | Unit 2 | Unit 3 | Unit 4 | Unit 5 | Total | Process Evaluation |
|---|---|---|---|---|---|---|---|---|
| Continuous Comprehensive Assessment (CCA) | Faculty | 10 | 10 | 10 | 10 | 10 | 50 | Refer CCA Guideline |
| End Semester Examination (ESE) | Institute | 10 | 10 | 10 | 10 | 10 | 50 | Each Unit Carries 10 marks Question |

### CO-PO Mapping

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

3: High, 2: Moderate, 1: Low, 0/-: No Mapping

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**Department of Electronics and Telecommunication**

## SY M Tech VLSI and Embedded Systems, Semester III

**Category: On Job Training**

**Course Code: VES2411P03** **Course Title: On Job Training/Internship**

| Teaching Scheme | | | | Evaluation Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L | T | P | Cr | Exam | Theory % Marks | | | Practical % Marks | |
| | | | | | Max | Min for Pass | | Max | Min for Pass |
| 0 | 0 | 20 | 10 | CCA | - | - | - | 100 | 40 |
| - | 0 | 60 | Total: 60 | ESE | - | | | - | |

| | |
|---|---|
| **Prerequisites:** NIL | |
| **Course Objectives:** | |
| 1. To Investigate Different Industries and Career Paths<br>2. To Develop a Professional Network<br>3. To Apply Academic Knowledge in a Professional Setting<br>4. To Enhance Time Management and Communication Skills<br>5. To Increase Employment Opportunities | |
| **Course Outcome:** After successful completion of the course the student will be able to | |
| CO1 | Investigate Various Industries and Employability Opportunities through Internship. |
| CO2 | Develop Professional Network through effective communication. |

### Syllabus

| Unit I | Internship | 60hrs |
|---|---|---|
| The student is expected to complete an internship in an industry related to the PG program, working at least 6 hours a day for a minimum of 3 weeks. This internship should take place after the end of Semester II and before the commencement of Semester III, after the examinations. The evaluation will be carried out in Semester III. The student must submit a daily report electronically to his/her supervisor. At the end of the internship, the student will submit a comprehensive final report. | | |
| **Unit II** | **Submission of Report on Internship** | **-hrs** |
| Student is required to submit report on internship work to his/her supervisor. | | |

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## SY M Tech VLSI and Embedded Systems, Semester III

## Rubrics for Continuous Evaluation

| Rubrics for CCA and ESE (100) | | |
|---|---|---|
| **No** | **Component** | **Marks** |
| 1 | Progressive Weekly Assessment of Internship work (25 x 3 weeks) | 75 |
| 2 | Complete Submission of Internship Report in hard copy | 25 |

## CO-PO Mapping

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 3 | 2 | 3 | 2 |
| **CO2** | 3 | 3 | 3 | 2 | 3 | 2 |

3: High, 2: Moderate, 1: Low, 0: No Mapping

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**Department of Electronics and Telecommunication**

## SY M Tech VLSI and Embedded Systems, Semester IV

### Syllabus Structure

| Course Code | Course | Teaching Scheme | | | | Evaluation Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | L | T | P | Cr | Exam | Theory % Marks | | | Practical % Marks | |
| | | | | | | | Max | Min for Pass | | Max | Min for Pass |
| VES2412P01 | Dissertation Phase III | 0 | 0 | 20 | 10 | CCA | - | - | - | 100 | 40 |
| VES2412P02 | Dissertation Phase IV | 0 | 0 | 24 | 12 | CCA | - | - | - | 50 | 20 |
| | | | | | | ESE | - | | | 50 | 20 |
| **Total** | | **0** | **0** | **44** | **22** | | | | | | |

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## SY M Tech VLSI and Embedded Systems, Semester IV

**Category: Dissertation Phase**

**Course Code: VES2412P01** **Course Title: Dissertation Phase III**

| Teaching Scheme | | | | Evaluation Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L | T | P | Cr | Exam | Theory % Marks | | | Practical % Marks | |
| | | | | | Max | Min for Pass | | Max | Min for Pass |
| 0 | 0 | 20 | 10 | CCA | - | - | - | 100 | 40 |
| 0 | 0 | 260 | Total: 260 | ESE | - | | | | |

| | |
|---|---|
| **Prerequisites:** Completion of DP II | |
| **Course Objectives:** | |
| To prepare the report of the dissertation work | |
| **Course Outcome:** After successful completion of the course the student will be able to | |
| CO1 | Construct the Progress Report on the Dissertation topic major focusing onSummary of Objectives Completed and Findings with discussions. |
| CO2 | Demonstrate the Progress Report on the Dissertation topic with major findings and their discussions. |

### Syllabus

| Unit I | Submission of Progress Report | 70 hrs |
|---|---|---|

1. Introduction
2. Literature Review
3. Statement of the Problem
4. Significance/Rationale
5. Objectives
6. Hypotheses/Research Questions
7. Methodology
8. Results and Discussions
9. Summary of Objectives Completed (More than 75 % should complete)
10. List of References

| Unit II | Submission of Progress Report and its Presentation | 30 hrs |
|---|---|---|

Student is required to present his/her synopsis in front of Committee of the Department

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## SY M Tech VLSI and Embedded Systems, Semester IV

## Rubrics for Continuous Evaluation

| Rubrics for CCA (100) | | |
|---|---|---|
| **No** | **Component** | **Marks** |
| 1 | Submission of Report in hard copy | 70 |
| 2 | Presentation on Dissertation Work | 30 |

## CO-PO Mapping

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 3 | 2 | 3 | 2 |
| **CO2** | 3 | 3 | 3 | 2 | 3 | 2 |

3: High, 2: Moderate, 1: Low, 0: No Mapping

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## SY M Tech VLSI and Embedded Systems, Semester IV

**Category: Dissertation Phase**

**Course Code: VES2412P02** **Course Title: Dissertation Phase IV**

| Teaching Scheme | | | | Evaluation Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L | T | P | Cr | Exam | Theory % Marks | | | Practical % Marks | |
| | | | | | Max | Min for Pass | | Max | Min for Pass |
| 0 | 0 | 8 | 4 | CCA | - | - | - | 50 | 40 |
| - | 0 | 104 | Total: 104 | ESE | - | | | 50 | |

| | |
|---|---|
| **Prerequisites:** Completion of DP III | |
| **Course Objectives:** | |
| To prepare the final report of the dissertation work | |
| **Course Outcome:** After successful completion of the course the student will be able to | |
| CO1 | Construct the Final Report on the Dissertation major focusing on Summary of Objectives Completed and Findings with discussions. |
| CO2 | Demonstrate the Final Report on the Dissertation with major findings and their discussions. |

### Syllabus

| Unit I | Submission of Final Report | 70 hrs |
|---|---|---|

1. Introduction
2. Literature Review
3. Statement of the Problem
4. Significance/Rationale
5. Objectives
6. Hypotheses/Research Questions
7. Methodology
8. Results and Discussions
9. Summary of Objectives Completed (100 % should complete)
10. List of References
11. List of Papers Published
12. Vita

Student is expected to publish a paper in the SCI/SCOPUS indexed Journal and Present the work in reputed conferences on his/her dissertation work.

| Unit II | Submission of Final Report and its Presentation | 30 hrs |
|---|---|---|

Student is required to present his/her work in front of Internal and External Committee of the

# D Y Patil College of Engineering, Akurdi, Pune

An Autonomous Institute from AY 2024-25, Affiliated to Savitribai Phule Pune University, Pune

**Department of Electronics and Telecommunication**

## SY M Tech VLSI and Embedded Systems, Semester IV

| Department |
|---|

## Rubrics for Continuous Evaluation

| Rubrics for CCA and ESE (100) | | |
|---|---|---|
| **No** | **Component** | **Marks** |
| 1 | Complete Submission of Final Report in hard copy (4 Sets) | 70 |
| 2 | Presentation on the final work in front of Internal and External Committee appointed by Department. | 30 |

## CO-PO Mapping

| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 3 | 2 | 3 | 2 |
| **CO2** | 3 | 3 | 3 | 2 | 3 | 2 |

3: High, 2: Moderate, 1: Low, 0: No Mapping

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