**III B. Tech – II Semester**

**(20ME6204) ANALYSIS AND COMPUTATION LAB (ANSYS & MATLAB)**

| Int. Marks | Ext. Marks | Total Marks | L | T | P | C |
|---|---|---|---|---|---|---|
| 15 | 35 | 50 | - | - | 3 | 1.5 |

**Pre-Requisites:** Basic computer knowledge, strength of materials

**Lab Objectives:**

The Students will acquire the knowledge:

- Using Analysis package build geometry, mesh that geometry, perform different analysis method on the mesh, perform the calculation, and post-process the results.
- To simulate and analyze PID controllers for a physical system using MATLAB.
- Understanding the validation of the numerical result by comparison with known analytical results.
- Understanding the numerical result by invoking the physical principles of fluid mechanics and heat transfer.

**PART-A**

FEA: Analysis of an imported model from 3D modeling packages or develop 3D model in analytical software to solve the different kind of solutions on the model like structural, thermal & vibration etc., To check different kind of meshing geometry and periodic methods using ANSYS, SIMULIA, ABAQUS & ALTAIR Etc.,

**PART-B**

MATLAB Programming

1. Sample programmes on MATLAB
2. Simulation and analysis of PID controller using SIMULINK
3. Solve the structural problems using MATLAB
4. Solve the thermal problems using MATLAB
5. Use of MATLAB to solve simple problems in vibration

**Lab Outcomes:**

Upon successful completion of this course student should be able to:

1. The student will be able to appreciate the utility of the tools like ANSYS or ABAQUS in solving real time problems and day to day problems.
2. Use of these tools for any engineering and real time applications
3. Acquire knowledge on utilizing these tools for a better project in their curriculum as well as they will be prepared to handle industry problems with confidence when it matters to use these tools in their Employment.
4. Analyze PID controllers for a physical system using MATLAB

**Course Outcomes:**

After successful completion of the course, the students will be able to:

| S. No | Course Outcome | BTL |
|---|---|---|
| 1. | The student will be able to appreciate the utility of the tools like ANSYS or ABAQUS in solving real time problems and day to day problems. | L4 |
| 2. | Use of these tools for any engineering and real time applications | L4 |
| 3. | Acquire knowledge on utilizing the tools | L4 |
| 4. | Analyze PID controllers for a physical system using MATLAB | L4 |

**Correlation of COs with POs& PSOs:**

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | 3 | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 2 |
| **CO2** | 3 | 3 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 2 | 2 | 3 | 3 | 2 |
| **CO3** | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| **CO4** | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 2 |