



LET US RISE ABOVE THE REST  
Marathwada ShikshanPrasarak

**DEOGIRI INSTITUTE OF ENGINEERING AND MANAGEMENT  
STUDIES, AURANGABAD**

*Department of Computer Science and Engineering*

**NOTICE**

**Date: 10/08/2023**

All B.Tech CSE students are hereby informed that Department is conducting the Value Addition Course on "React JS " every Saturday. The course will be delivered by Ex. Infy Mr. Amol D. Wakhare. Those who are willing to enroll for this course are informed to mark your concerns using link below. The registration link will be active till 11 Aug 2023 midnight. All students are informed to note that only first 40 students will be selected for this course. The course will be conducted 4 hours every Saturday. The contents of the course is attached here with.

Link to Apply: <https://tinyurl.com/diemsreactjs2023>

**Note: For any queries, you can contact Prof. P.B. Mahadik**

  
**HOD**

# REACT JS COURSE SYLLABUS

(Prerequisite: HTML, CSS, Java Script)

## **JAVASCRIPT BASICS**

- Introduction to Programming in JavaScript
- Variables and Data Types
- Functions in JavaScript
- Working with Strings & Numbers
- Application Logic & Loops
- 

## **ADVANCED JAVASCRIPT CONCEPTS & FEATURES**

- Introduction to Arrays & Objects
- Working with Arrays
- Working with Objects
- Variable Types & Scoping
- Error Handling
- Asynchronous JavaScript

## **REACT JS**

- Introduction to Node & NPM
- React Installation
- Create React App Boilerplate & Introduction to JSX
- Organising Code & Creating a Hello World Application

## **REACT COMPONENTS AND STATES**

- React Basics: Components with States & Props
- Passing Static & Dynamic Data between Components
- Event Handling
- React Conditional
- React List

## **REACT HOOKS**

- useState Hooks
- useEffect Hooks

## **WORKING WITH DATA**

- Introduction to Axios
- Fetching Data using API Calls
- Brief Introduction to Redux

## **REACT REDUX**

- Redux Installation
- Redux core concept
- Redux data Flow
- Redux-Store
- Redux-Action
- Redux-Reducer

## Registration Notice for Value Addition Course on "React JS "

Pravin Mahadik <pravinmahadik@dietms.org>

Thu, Aug 10, 2023 at 5:23 PM

To: PANKAJ BHARAT BHOSALE <pankajb1712@gmail.com>, RITESH SANTOSH MANGDARE <santoshmangdare11@gmail.com>, SUNNY SURESHPRASAD DAS <sunnydas7447@gmail.com>, PRASAD SUBHASH SONAWANE <prasadsonawane101@gmail.com>, GAURAV RANJITLAL PANDE <gauravpande281@gmail.com>, VAIBHAV UMESH SURYAWANSHI <vaibhavsuryawanshi21980@gmail.com>, ABHISHEK RAJENDRA JADHAV <abhishekjadhavnumber1@gmail.com>, TEJAS VIDYADHAR DALVI <tejasdalvi124b@gmail.com>, SANAN KHUSRO TALIGAR <sananabdul56@gmail.com>, TEJASVINI MACHCHHINDRA SHIRSATH <tejasvini0812@gmail.com>, KALYANI MANIKLAL SUPEKAR <mdsupekar@gmail.com>, MAYANK MOHAN BONDRE <makbond0902@gmail.com>, PRIYA BHANU BALGOTRA <priyabalgotra1@gmail.com>, RUSHIKESH BHAGINATH BANKAR <rushikeshbankar333@gmail.com>, ABHISHEK RAMESH CHAVAN <abishekchavan26@gmail.com>, ANURAG KHUSHAL TAJNE <anuragtajne17@gmail.com>, NIKITA MAHESH NAIK <nikitanaik121202@gmail.com>, SATYAMKUMAR ANIL RATHOD <rathodsatyamkumar@gmail.com>, PAWAR SIDDHI VILAS <sidpawar2404@gmail.com>, SHITAL 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Cc: HOD CSE <hodcse@diems.org>, Amol Wakhare <amolwakhare@diems.org>

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Note: For any queries, you can contact Prof., P.B. Mahadik

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Regards,  
Prof. Pravin B. Mahadik,  
Asst.Professor, CSE Dept,DIEMS,Aurangabad  
Mob-9423730994

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2 attachments

 Adobe Scan 10 Aug 2023.pdf  
276K

 REACT JS COURSE SYLLABUS.docx  
16K



Sr.No	Name of Student	12-Aug		19-Aug		26-Aug		2-Sep		9-Sep		23-Sep		30-Sep		7-Oct		21-Oct		28-Oct	
		Ist session	II session	Ist session	II session	Ist session	II session	Ist session	II session	Ist session	II session	Ist session	II session	Ist session	II session	Ist session	II session	Ist session	II session	Ist session	II session
37	Wagh Yogita Rajendra	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
38	Thornbare Vedangi Mahendra	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
39	Wadgaonkar Prathamesh Deepak	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
40	Abu Hayyan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
41	Sonawane Tejias Dinesh	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
42	Nalge Shivam Shyam	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
43	Nilekar Ankita Abhay	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
44	SONAWANE PRASAD SUBHASH	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
45	Mankape Nikita Sahcrao	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
46	Mahajan Renuka Manoj	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0

  
HOD

  
A.D. Wakhale  
Coordinator

**M.S.P.Mandal's**  
**Deogiri Institute of Engineering and Management Studies**  
**Mechanical Engineering Department**

Class: B.Tech. A (Hall No:310) TIME TABLE FOR THE YEAR 2023 - 2024 TERM I w.e.f 21/08/2023

PERIODS	I	II	III	IV	V	VI
TIMING	10.15 a.m. TO 11.15 a.m.	11.15 a.m. TO 12.15 p.m.	1.15 p.m. TO 2.15 p.m.	2.15 p.m. TO 3.15 p.m.	3.30 p.m. TO 4.30 p.m.	4.30 p.m. TO 5.30 p.m.
MONDAY	A1-MTX (JJS)  A2-AICE (GPB)   A3-ANSYS (ASD)  A4-LIB  A5-LIB		EE (BGM)	SD (AJP)	MINI-PROJECT	
TUESDAY	MTX (KBK)	AICE (SVL)	EE (BGM)	IEM (SMA)	A1-AICE (CDS)  A2-ANSYS (ASD)   A3-LIB  A4-LIB  A5-MTX (JJS)	
WEDNESDAY	MTX (KBK)	AICE (SVL)	IEM (SMA)	SD (AJP)	A1-ANSYS (ASD)  A2-LIB   A3-LIB  A4-MTX (KBK)  A5-AICE (GPB)	
THURSDAY	SD (AJP)	AICE (SVL)	MTX (KBK)	EE (BGM)	A1-LIB  A2-LIB  A3-MTX (KBK)   A4-AICE (CDS)  A5-ANSYS (ASD)	
FRIDAY	A1-LIB  A2-MTX (KBK)   A3-AICE (GPB)  A4-ANSYS (ASD)  A1-LIB		IEM (SMA)	MINI-PROJECT	MINI-PROJECT	
SATURDAY	MINI-PROJECT					

Staff Initials	Name of Staff	Course Code	Course Title
SVL	Dr. S.V. Lahane	BTMPE703D	Advanced IC Engines
SMA	Dr. S.M. Agrawal	BTHM702	Industrial Engineering and Management
KBK	Prof. K.B.Kolhapure	BTMEC701	Mechatronics
AJP	Prof. A.J. Punewale	BTMOE704A	Sustainable Development
BGM	Dr. B.G. Marlapalle	BTMOE705A	Engineering Economics

Practical Batches	Roll Nos.
A1	ME4101-ME4115
A2	ME4116-ME4130
A3	ME4131-ME4145
A4	ME4146-ME4160
A5	ME4161-Onwards

Class Teacher: Prof. K.B. Kolhapure

  
Time Table Co-ordinator

  
Central Time Table Co-ordinator

  
HOD

  
Dean Academics

DIEMS VISION: Nation Building by creating Opportunities for Rural and Urban students through Excellence in Education and Research in the field of Engineering and Management.

**MSPM'S**

**Deogiri Institute of Engineering and Management Studies,  
Chhatrapati Sambhajinagar  
Department of Mechanical Engineering**

# **ENGINEERING ANALYSIS WITH ANSYS WORKBENCH**

<b>Sr. No.</b>	<b>Tutorial No.</b>	<b>Content</b>	<b>No. of Hours</b>
<b>1</b>		<b>Introduction to ANSYS Workbench</b>	<b>2</b>
<b>2</b>	<b>1</b>	<b>Static Structural Analysis of Cantilever Beam</b>	<b>2</b>
<b>3</b>	<b>2</b>	<b>Optimal Pressure Tank Shape Analysis</b>	<b>2</b>
<b>4</b>	<b>3</b>	<b>Static Structural Analysis of a Flywheel</b>	<b>2</b>
<b>5</b>	<b>4</b>	<b>Stress Concentration Factor in a Plate with a Hole</b>	<b>2</b>
<b>6</b>	<b>5</b>	<b>Parametric Analysis of Pressure Vessel</b>	<b>2</b>
<b>7</b>	<b>6</b>	<b>Contact Stress Analysis of Knuckle Joint</b>	<b>2</b>
<b>8</b>	<b>7</b>	<b>Introduction to Thermal Analysis</b>	<b>2</b>
<b>9</b>	<b>8</b>	<b>Thermal Analysis of PCB</b>	<b>2</b>
<b>10</b>	<b>9</b>	<b>Coupled Thermo-Structural Analysis of Gas Turbine Blade</b>	<b>2</b>
			<b>Total Hours: 20</b>

**VISION:** Developing the department as a center of excellence to produce engineers with knowledge, skills and character for all occupation.

**MISSION:**

1-To impart quality education to the students to develop technical skills and make them a competitive mechanical engineer.

2-To educate, prepare, inspire and mentor students to excel professionally and personally to serve the society.

3-To inculcate research attitude among faculty and students.



# Tutorial No. 1 Static Structural Analysis of Cantilever Beam

## Prerequisites:

Basic Concepts of Mechanics of Materials: Stress and Strain and their types, various material properties, Types of Beams, Beam Loading and Support Conditions.

## Problem Statement:

Perform a static structural analysis of a fixed beam made of structural steel subjected to pressure on the upper face. Calculate the total deformation, directional deformation in the direction of the pressure, equivalent (von Mises) stress, and equivalent strain for two loading cases: 1 MPa and 2 MPa pressure.

## Material Properties:

Material: Structural Steel (From ANSYS Material Library)

## Geometry:

Length of the Beam: 100 mm

Cross-Section Dimensions: 10 mm x 10 mm

## Loading Conditions:

Case 1: The upper face of the beam is subjected to a uniform pressure of 1 MPa.

Case 2: The upper face of the beam is subjected to a uniform pressure of 2 MPa.

## Boundary Conditions:

Fixed Support: One end of the beam is fixed, restricting all degrees of freedom.

Pressure Load: Apply a uniform pressure on the upper face of the beam for both cases.

## Solution:

Solve the static structural analysis for each loading case to determine the following:

- Total Deformation
- Directional Deformation in the direction of the pressure (Y-direction)
- Equivalent (von Mises) Stress
- Equivalent Strain

## Deliverables:

A comprehensive report including contour plots and results of total deformation, directional deformation in the Y-direction, equivalent stress, and equivalent strain for both loading cases.

## Tutorial No. 2 Optimal Pressure Tank Shape Analysis

### Prerequisites:

Basic Concepts of Mechanics of Materials: Stress and Strain and their types, various material properties.

Basics of Pressure Vessels: Internal Pressure, Concepts of hoop stress, longitudinal stress.

### Problem Statement:

Perform a static structural analysis of two pressure tanks with equal internal perimeters but different cross-sectional shapes (circular and rectangular) to compare the equivalent stress and total deformation. Both tanks are subjected to a constant internal pressure of 1 MPa and have a wall thickness of 1 mm. Recommend the optimal tank configuration based on the analysis results.

### Material Properties:

Material: My\_Steel

Young's Modulus: 220 GPa

Poisson's Ratio: 0.35

Density: 8050 kg/m<sup>3</sup>

Yield Strength: 240 MPa

### Loading Conditions:

Internal Pressure: 1 MPa uniformly applied to the internal surfaces of both tanks.

Boundary Conditions:

The tanks are assumed to be fixed at both ends, restricting all degrees of freedom.

### Solution:

Solve the static structural analysis for both tanks to determine the following:

- Total Deformation
- Equivalent (von Mises) Stress

### Deliverables:

- Detailed report including contour plots and descriptions of total deformation and equivalent stress for both tank shapes.
- Comparison of the results to determine which tank shape provides better structural performance under the given loading conditions.
- Recommendation on the optimal tank configuration based on the analysis results.

## Tutorial No. 3 Static Structural Analysis of a Flywheel

### Prerequisites:

Basic Concepts of Mechanics of Materials: Stress and Strain and their types, various material properties.

Purpose of Flywheels, Concepts of radial, axial, and circumferential stresses in rotating discs.

### Problem Statement:

Perform a static structural analysis of a flywheel subjected to a rotational speed of 100 rad/sec using three different materials: Structural Steel, Stainless Steel, and a newly discovered material (Deogirium). For each material, calculate the normal stress in the radial, axial, and circumferential directions, total deformation, radial deformation, and equivalent (von Mises) stress.

### Material Properties:

1. Structural Steel (From ANSYS Material Library)
2. Stainless Steel (From ANSYS Material Library)
3. Deogirium (Newly Discovered Material):

Density: 5000 kg/m<sup>3</sup>

Young's Modulus: 300 GPa

Poisson's Ratio: 0.4

### Loading Conditions:

Rotational Speed: 100 rad/sec

### Boundary Conditions:

The flywheel is assumed to be fixed at the central axis to prevent rigid body motion.

### Solution:

Solve the static structural analysis for each material to determine the following:

- Normal Stress in the Radial Direction
- Normal Stress in the Axial Direction
- Normal Stress in the Circumferential Direction
- Total Deformation of the Flywheel
- Radial Deformation of the Flywheel
- Equivalent (von Mises) Stress

### Deliverables:

- Detailed report including contour plots and descriptions of normal stresses (radial, axial, and circumferential), total deformation, radial deformation, and equivalent stress for each material.
- Comparison of the results for the three different materials.
- Recommendation on the most suitable material for the flywheel based on the analysis results.

## Tutorial No. 4 Stress Concentration Factor in a Plate with a Hole

### Prerequisites:

Basic Concepts of Mechanics of Materials: Stress and Strain and their types, various material properties.

Stress Concentration: Stress Concentration Factor, Nominal Stress, Maximum Stress.

### Problem Statement:

Calculate the maximum stress analytically for a plate with a hole subjected to a tensile force using the equations for stress concentration factor, nominal stress, and maximum stress. Additionally, conduct a static structural analysis on the plate using ANSYS Workbench to find the maximum stress for different mesh sizes (auto mesh, 10 mm, and 5 mm). Compare the analytical and numerical results of maximum stress and calculate the error.

### Material Properties:

Structural Steel (From ANSYS Material Library)

### Geometry:

- Plate Width (w): 100 mm
- Plate Length (L): 200 mm
- Plate Thickness (t): 10 mm
- Hole Diameter (d): 30 mm

### Loading Conditions:

Tensile Force: 10,000 N applied uniformly at both ends of the plate along the length.

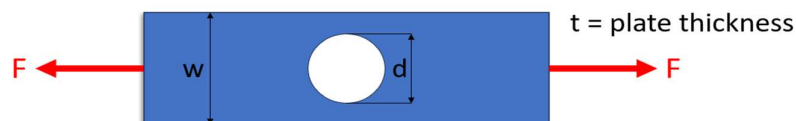
### Comparison and Error Calculation:

- Compare the Analytical and Numerical maximum stresses.
- Calculate the Error.

### Deliverables:

- Detailed report including the analytical calculation of maximum stress.
- Numerical results of maximum stress for auto mesh, 10 mm mesh, and 5 mm mesh.
- Comparison of analytical and numerical results.
- Error calculation and discussion on the accuracy of the numerical methods with different mesh sizes.

### Stress Concentration Factor



$$\sigma_{max} = K_t \sigma_{nom} \quad \sigma_{nom} = \frac{F}{(w - d)t}$$

$$K_t = 3 - 3.13 \left( \frac{d}{w} \right) + 3.66 \left( \frac{d}{w} \right)^2 - 1.53 \left( \frac{d}{w} \right)^3$$

## Tutorial No. 5 Parametric Analysis of Pressure Vessel

### Prerequisites:

Basic Concepts of Mechanics of Materials: Stress and Strain and their types, various material properties, Safety Factor.

Pressure Vessel Theory: Types of Pressure Vessels, Concepts of hoop stress, radial stress, and axial stress.

### Problem Statement:

Perform a static structural analysis to determine the internal pressure at which the safety factor of a given pressure vessel is 1.00. The analysis will involve setting the internal pressure as the input parameter and the safety factor as the output parameter. Use Aluminium Alloy from the ANSYS material library.

### Material:

Aluminium Alloy (from ANSYS material library)

### Boundary Conditions:

- Fixed Support: The supports of the vessel are fixed, restricting all degrees of freedom.
- Flange Coupling Restriction: The face connected to the flange is restricted in the vertical direction to simulate the flange coupling.
- Internal Pressure: All internal surfaces of the vessel are subjected to internal pressure, which will be varied to determine the safety factor.

### Parameter Setup:

Set the internal pressure and the safety factor as parameters.

### Solution:

- Run a series of static structural analyses by varying the internal pressure using parameters.
- Determine the internal pressure at which the safety factor equals 1.00.

### Deliverables:

- Detailed report including contour plots and descriptions of the internal pressure, stress distribution, deformation, and safety factors.
- Identification of the internal pressure at which the safety factor is 1.00.

## Tutorial No. 6 Contact Stress Analysis of Knuckle Joint

### Prerequisites:

Basic Concepts of Mechanics of Materials: Stress and Strain and their types, various material properties.

Knuckle Joint Assembly: Components of a Knuckle Joint.

### Problem Statement:

Perform a static structural analysis of a knuckle joint assembly to determine the total deformation and equivalent (von Mises) stress when subjected to a tensile force of 10,000 N. Additionally, use the contact tool in ANSYS to evaluate contact status, frictional stress, contact pressure, gaps, and sliding distance for all contacts.

### Material Properties:

- Material: Aluminum
- Young's Modulus: 70 GPa
- Poisson's Ratio: 0.33
- Density: 2700 kg/m<sup>3</sup>
- Yield Strength: 250 MPa

### Boundary Conditions:

- Fixed Support: One end of the knuckle joint assembly is fixed to restrict all degrees of freedom.
- Tensile Force: The other end of the assembly is subjected to a tensile force of 10,000 N along the axis of the joint.

### Contact Conditions:

All contacts between the components are defined as frictional contacts with a coefficient of friction of 0.15.

### Solution:

Solve the static structural analysis to determine the following:

- Total Deformation
- Equivalent (von Mises) Stress
- Contact Tool Evaluation: Use the contact tool in ANSYS to evaluate:
  - Contact Status: Determine whether the contact surfaces are open or closed.
  - Frictional Stress: Evaluate the frictional stress at the contact surfaces.
  - Contact Pressure: Determine the pressure distribution across the contact surfaces.
  - Gaps: Measure any gaps that exist between the contact surfaces.
  - Sliding Distance: Evaluate the sliding distance between contact surfaces.

### Deliverables:

Detailed report including plots and descriptions of total deformation, equivalent stress, contact status, frictional stress, contact pressure, gaps, and sliding distance.

## Tutorial No. 7 Introduction to Thermal Analysis

**Prerequisites:** Basics of heat transfer: Modes of heat transfer, Thermal boundary conditions, Thermal Properties of Materials.

Perform a steady-state thermal analysis to determine the temperature distribution and heat flux in a 2D solid plate made of “Deogirium 123”. Create contour plots illustrating the plate’s total temperature distribution and total heat flux, highlighting the maximum and minimum temperature locations.

### Material Properties:

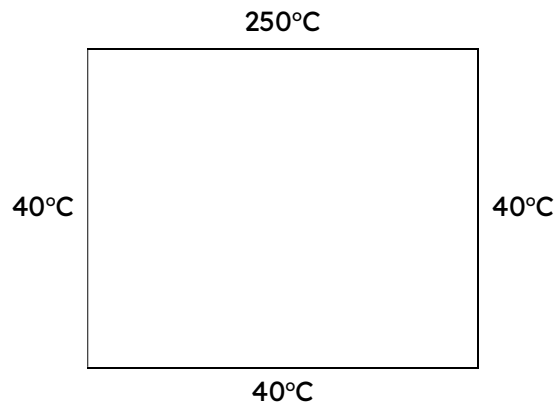
- Material: Deogirium 123
- Thermal Conductivity: 15 W/m·K

### Geometry:

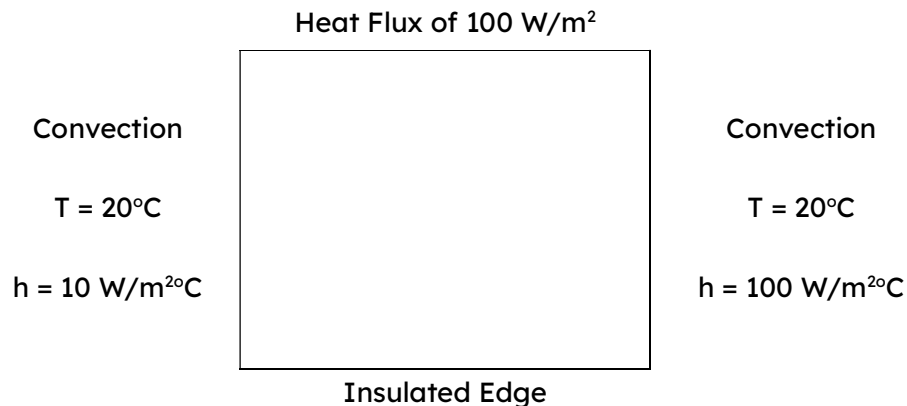
- Plate Dimensions: 1 meter by 1 meter (2D plate)
- Thickness: 1 mm

### Thermal Boundary Conditions:

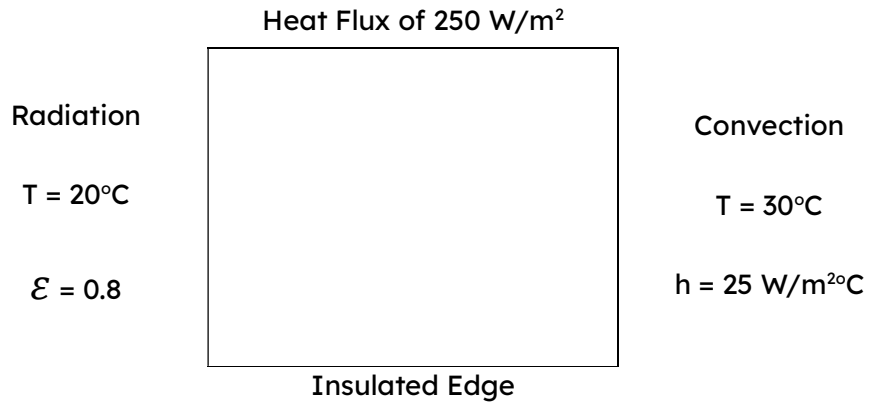
- **Case 1:**



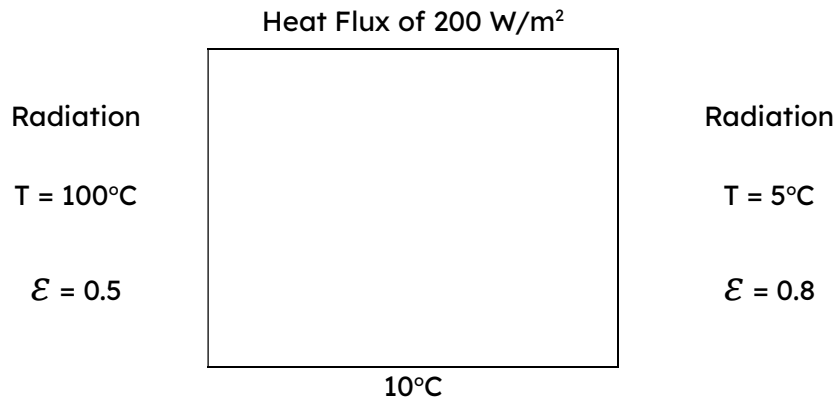
- **Case 2:**



- **Case 3:**



- **Case 4:**



**Deliverables:**

Detailed report including:

- Contour plots of the total temperature distribution and total heat flux.
- Vector plots of total heat flux.
- Identification of the locations of maximum and minimum temperatures and heat flux.



## Tutorial No. 8 Thermal Analysis of PCB

### Prerequisites:

Basics of heat transfer: Modes of heat transfer, Thermal boundary conditions, Thermal Properties of Materials.

Electronics Cooling Basics: Heat Generation in Electronics, Thermal Management in Electronics.

### Problem Statement:

The thermal performance of a printed circuit board (PCB) with heat-generating components such as a CPU and chips is critical for ensuring reliable operation. This analysis aims to evaluate the temperature distribution and identify the maximum temperature in the PCB assembly. If the maximum temperature exceeds the specified limit, the analysis will be repeated with the addition of a heat sink to assess its effectiveness.

Perform a steady-state thermal analysis of a PCB with a CPU at the centre and other chips at the four corners to determine the temperature distribution and maximum temperature in the circuit. If the maximum temperature exceeds 90°C, repeat the analysis with a heat sink and verify whether the maximum temperature falls below 90°C.

### Materials:

- PCB: FR-Epoxy
  - Thermal Conductivity: 0.294 W/m°C
- CPU and Chips: Silicon
  - Thermal Conductivity: 148 W/m°C
- Heat Sink (if required): Aluminium
  - Thermal Conductivity: 237.5 W/m°C

### Heat Generation Rates:

- CPU:  $4.34 \times 10^6$  W/m<sup>3</sup>
- Chips:  $5 \times 10^6$  W/m<sup>3</sup>

### Boundary Conditions:

- Convection:
  - Ambient Temperature: 22°C
  - Convective Heat Transfer Coefficient: 5 W/m<sup>2</sup>°C
- Radiation:
  - Ambient Temperature: 22°C
  - Emissivity:
    - PCB: 0.8
    - CPU and Chips: 0.5
    - Heat Sink: 0.5 (if installed)

### Solve:

- Create contour plots illustrating the temperature distribution across the PCB, CPU, and chips.
- Identify and highlight the maximum temperature in the assembly for both cases (with and without the heat sink).

### Deliverables:

Detailed report including contour plots of the temperature distribution, maximum temperature in the assembly, comparison of the results with and without the heat sink, and conclusion on whether the heat sink effectively reduces the maximum temperature below 90°C.

# Tutorial No. 9 Coupled Thermo-Structural Analysis of a Gas Turbine Blade

## Prerequisites:

Basics of heat transfer: Modes of heat transfer, Thermal boundary conditions, Thermal Properties of Materials.

Basic Concepts of Mechanics of Materials: Stress and Strain and their types, various material properties.

Gas Turbine Operation: High-temperature environment in gas turbine, Materials for High-Temperature Applications

## Problem Statement:

A gas turbine blade operates under extreme thermal and mechanical conditions, exposed to high-temperature gases and subjected to significant rotational forces. This analysis aims to assess the thermal and structural performance of the blade using two different materials: Titanium Alloy (Ti-6Al-4V) and Inconel 718.

Perform a coupled thermo-structural analysis of a gas turbine blade made of Titanium Alloy to determine the temperature distribution, thermal load affected stress distribution, and safety factor. Then, replace the material with Inconel 718 and observe the changes in the results.

## Materials Properties:

- Titanium Alloy (Ti-6Al-4V):
  - Thermal Conductivity: 7.2 W/m·K
  - Density: 4430 kg/m<sup>3</sup>
  - Specific Heat: 580 J/kg·K
  - Young's Modulus: 113.8 GPa
  - Poisson's Ratio: 0.342
  - Yield Strength: 880 MPa
- Inconel 718:
  - Thermal Conductivity: 11.4 W/m·K
  - Density: 8190 kg/m<sup>3</sup>
  - Specific Heat: 435 J/kg·K
  - Young's Modulus: 200 GPa
  - Poisson's Ratio: 0.294
  - Yield Strength: 1030 MPa

## Boundary Conditions:

- Convection Thermal Boundary Conditions:
  - The blade surface is exposed to gases at 800°C.
  - Convective heat transfer coefficient on the blade surface: 1000 W/m<sup>2</sup>·°C.
  - The hub of the blade is maintained at a temperature of 600°C.
- Structural Boundary Conditions:
  - The blade is rotating at 100 rad/sec.
  - The hub of the blade is fixed (no translational or rotational movement).

**Deliverables:**

Detailed report including the description of the geometry, material properties, and boundary conditions, contour plots of the temperature distribution and stress distribution for both materials, comparison of safety factors for both materials, and conclusion on the suitability of each material for the turbine blade application.

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Department of Mechanical Engineering

Practical Evaluation Sheet

Class: **B.Tech B** Subject: **ANSYS** Batch: **B1**  
Lab: **Optimization Lab** Date: **23/08/2023** Practical No: **01**

Title of the Practical: **Introduction**

Sr. No.	Roll No	Name of Student	Attendance (04)	Journal Correction (01)	Oral (01)	Total (06 Marks)	Signature of Student
1	ME4201	ADHANE ABHISHEK SANJAY	04	-	01	05	Abhishek
2	ME4202	AHIRRAO SAMBHAJI SHIVAJI	04	-	01	05	Ahirrao
3	ME4203	BAGUL AJIT KADUBA	04	-	01	05	Ajit
4	ME4204	BANSOD VARAD SUBHASH	04	-	01	05	Varad
5	ME4205	BAPAT SUMEDH SUNIL	04	-	01	05	Sumedh
6	ME4206	BHAKARE YASH SATISH	04	-	AB	-	-
7	ME4207	BHALE RAVI BABAN	04	-	01	05	Ravi
8	ME4208	BHALE SHUBHAM BALASAHEB	04	-	01	05	Shubham
9	ME4209	BURKULE VARAD MADHUKAR	04	-	01	05	Varad
10	ME4210	CHAUDHARI VINOD ADITYA	04	-	01	05	Vinod
11	ME4211	CHAVAN ABHIJEET SHIVAJI	04	-	01	05	Abhijeet
12	ME4212	CHAVAN TUSHAR JITENDRA	04	-	01	05	Tushar
13	ME4213	CHOUNDIYE VISHAL OMPRAKASH	04	-	01	05	Vishal
14	ME4214	CHOUNDIYE YASH LAXMINARAYAN	04	-	01	05	Yash
15	ME4215	DANDAGE VINAY GANESH	04	-	01	05	Vinay

Name & Signature of Practical Faculty: **A.J. Punawale** B.Tech Co-ordinator: **D. J. Jadhav** HMED: **HMED**

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Department of Mechanical Engineering  
Practical Evaluation Sheet

Class: **B.Tech B** Subject: **ANSYS** Batch: **B1**  
Lab: **OPTIMIZATION** Date: **30/08/2023** Practical No: **2**

Title of the Practical: **Static structural analysis**

Sr. No.	Roll No	Name of Student	Attendance (04)	Journal Correction (01)	Oral (01)	Total (06 Marks)	Signature of Student
1	ME4201	ADHANE ABHISHEK SANJAY	04	-	01	05	Abhishek
2	ME4202	AHIRRAO SAMBHAJI SHIVAJI	04	-	01	05	Ahirrao
3	ME4203	BAGUL AJIT KADUBA	04	-	01	05	Ajit
4	ME4204	BANSOD VARAD SUBHASH	04	-	01	05	Varad
5	ME4205	BAPAT SUMEDH SUNIL	04	-	01	05	Sumedh
6	ME4206	BHAKARE YASH SATISH	-	-	AB	-	-
7	ME4207	BHALE RAVI BABAN	04	-	01	05	Ravi
8	ME4208	BHALE SHUBHAM BALASAHEB	-	-	AB	-	-
9	ME4209	BURKULE VARAD MADHUKAR	04	-	01	05	Varad
10	ME4210	CHAUDHARI VINOD ADITYA	04	-	01	05	Vinod
11	ME4211	CHAVAN ABHIJEET SHIVAJI	-	-	AB	-	-
12	ME4212	CHAVAN TUSHAR JITENDRA	-	-	AB	-	-
13	ME4213	CHOUNDIYE VISHAL OMPRAKASH	-	-	AB	-	-
14	ME4214	CHOUNDIYE YASH LAXMINARAYAN	04	-	01	05	Yash
15	ME4215	DANDAGE VINAY GANESH	04	-	01	05	Vinay

Name & Signature of Practical Faculty: **A.J. Punawale** B.Tech Co-ordinator: **D. J. Jadhav** HMED: **HMED**

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Department of Mechanical Engineering

Practical Evaluation Sheet

Class: B.Tech B

Subject: ANSYS

Batch: B1

Lab: ANSYS

Date: 08/09/2023

Practical No: 3

Title of the Practical: Static structural Analysis of Cantilever Beam

Sr. No.	Roll No	Name of Student	Comprehension (C) 4 Marks	Accuracy/Appropriateness/Presentation (A) 4 Marks	Punctuality (p) 2 Marks	Total Marks (10)	Signature of Student
1	ME4201	ADHANE ABHISHEK SANJAY	02	03	02	07	Abhishek
2	ME4202	AHIRRAO SAMBHAJI SHIVAJI	03	03	02	08	Abhishek
3	ME4203	BAGUL AJIT KADUBA	02	02	02	06	Abhishek
4	ME4204	BANSOD VARAD SUBHASH	02	AB	02	06	Abhishek
5	ME4205	BAPAT SUMEDH SUNIL	02	02	02	06	Abhishek
6	ME4206	BHAKARE YASH SATISH	02	02	02	06	Abhishek
7	ME4207	BHALE RAVI BABAN	02	02	02	06	Abhishek
8	ME4208	BHALE SHUBHAM BALASAHEB	02	03	02	07	Abhishek
9	ME4209	BURKULE VARAD MADHUKAR	03	02	02	07	Abhishek
10	ME4210	CHAUDHARI VINOD ADITYA	02	02	02	06	Abhishek
11	ME4211	CHAVAN ABHIJEET SHIVAJI	02	02	02	06	Abhishek
12	ME4212	CHAVAN TUSHAR JITENDRA	02	02	02	06	Abhishek
13	ME4213	CHOUNDIYE VISHAL OMPRAKASH	02	03	02	07	Abhishek
14	ME4214	CHOUNDIYE YASH LAXMINARAYAN	03	03	02	08	Abhishek
15	ME4215	DANDAGE VINAY GANESH	02	03	02	07	Abhishek

A.J. Punekar  
Name & Signature of Practical Faculty

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B.Tech Co-ordinator

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Department of Mechanical Engineering  
Practical Evaluation Sheet

Class: B.Tech B

Subject: ANSYS

Batch: B1

Lab:

Date: 13/09/2023

Practical No: 4

Title of the Practical: Structural analysis of Knuckle Joint

Sr. No.	Roll No	Name of Student	Comprehension (C) 4 Marks	Accuracy/Appropriateness/Presentation (A) 4 Marks	Punctuality (p) 2 Marks	Total Marks (10)	Signature of Student
1	ME4201	ADHANE ABHISHEK SANJAY	03	03	02	08	Abhishek
2	ME4202	AHIRRAO SAMBHAJI SHIVAJI	03	03	02	08	Abhishek
3	ME4203	BAGUL AJIT KADUBA	02	03	02	07	Abhishek
4	ME4204	BANSOD VARAD SUBHASH	02	03	02	07	Abhishek
5	ME4205	BAPAT SUMEDH SUNIL	02	03	02	07	Abhishek
6	ME4206	BHAKARE YASH SATISH	03	03	02	08	Abhishek
7	ME4207	BHALE RAVI BABAN	03	02	02	07	Abhishek
8	ME4208	BHALE SHUBHAM BALASAHEB	03	AB	02	08	Abhishek
9	ME4209	BURKULE VARAD MADHUKAR	03	03	02	08	Abhishek
10	ME4210	CHAUDHARI VINOD ADITYA	03	03	02	08	Abhishek
11	ME4211	CHAVAN ABHIJEET SHIVAJI	03	03	02	08	Abhishek
12	ME4212	CHAVAN TUSHAR JITENDRA	03	03	02	08	Abhishek
13	ME4213	CHOUNDIYE VISHAL OMPRAKASH	03	03	02	08	Abhishek
14	ME4214	CHOUNDIYE YASH LAXMINARAYAN	03	03	02	08	Abhishek
15	ME4215	DANDAGE VINAY GANESH	03	03	02	08	Abhishek

A.J. Punekar  
Name & Signature of Practical Faculty

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B.Tech Co-ordinator

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Department of Mechanical Engineering  
Practical Evaluation Sheet

Class B.Tech B

Lab : OPTIMIZATION

Subject : ANSYS

Batch : B1

Date : 27/09/2023

Practical No : 05

Title of the Practical : Structural analysis of life with Different materials

Sr. No.	Roll No	Name of Student	Comprehension (04)	Accuracy / Appropriateness / Presentation (04)	Punctuality (02)	Total (10 Marks)	Signature of Student
1	ME4201	ADHANE ABHISHEK SANJAY	02	03	02	07	Abhishek
2	ME4202	AHIRRAO SAMBHAJI SHIVAJI	03	03	02	08	Shirao
3	ME4203	BAGUL AJIT KADUBA	02	02	02	06	Ajit
4	ME4204	BANSOD VARAD SUBHASH		AB			
5	ME4205	BAPAT SUMEDH SUNIL		AB			
6	ME4206	BHAKARE YASH SATISH		AB			
7	ME4207	BHALE RAVI BABAN		AB			
8	ME4208	BHALE SHUBHAM BALASAHEB	03	02	02	07	Shubham
9	ME4209	BURKULE VARAD MADHUKAR	03	03	01	07	Varad
10	ME4210	CHAUDHARI VINOD ADITYA	02	02	02	06	Vinod
11	ME4211	CHAVAN ABHIJEET SHIVAJI		AB			
12	ME4212	CHAVAN TUSHAR JITENDRA	03	02	02	07	Tushar
13	ME4213	CHOUNDIYE VISHAL OMPRAKASH		AB			
14	ME4214	CHOUNDIYE YASH LAXMINARAYAN	03	03	02	08	Yash
15	ME4215	DANDAGE VINAY GANESH	03	03	02	08	Vinay

A.J. Punevale

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Department of Mechanical Engineering  
Practical Evaluation Sheet

Class B.Tech B

Lab : OPTIMIZATION

Subject : ANSYS

Batch : B1

Date : 04/10/2023

Practical No : 06

Title of the Practical : Thermal Analysis of composite wall

Sr. No.	Roll No	Name of Student	Comprehension (04)	Accuracy / Appropriateness / Presentation (04)	Punctuality (02)	Total (10 Marks)	Signature of Student
1	ME4201	ADHANE ABHISHEK SANJAY	04	03	02	09	Abhishek
2	ME4202	AHIRRAO SAMBHAJI SHIVAJI	04	04	02	10	Shirao
3	ME4203	BAGUL AJIT KADUBA	02	03	02	07	Ajit
4	ME4204	BANSOD VARAD SUBHASH	04	03	02	09	Varad
5	ME4205	BAPAT SUMEDH SUNIL	04	03	00	07	Sumedh
6	ME4206	BHAKARE YASH SATISH	04	03	00	07	Yash
7	ME4207	BHALE RAVI BABAN	04	03	00	07	Ravi
8	ME4208	BHALE SHUBHAM BALASAHEB		AB			
9	ME4209	BURKULE VARAD MADHUKAR		AB			
10	ME4210	CHAUDHARI VINOD ADITYA	04	04	02	10	Vinod
11	ME4211	CHAVAN ABHIJEET SHIVAJI	04	03	00	07	Abhishek
12	ME4212	CHAVAN TUSHAR JITENDRA	04	04	00	08	Tushar
13	ME4213	CHOUNDIYE VISHAL OMPRAKASH	03	04	02	09	Vinod
14	ME4214	CHOUNDIYE YASH LAXMINARAYAN	04	04	02	10	Yash
15	ME4215	DANDAGE VINAY GANESH	04	04	02	10	Vinay

A.J. Punevale

D. J. J. J.

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Department of Mechanical Engineering  
Practical Evaluation Sheet

Class B.Tech B

Lab : ANSYS

Subject : ANSYS

Batch : B1

Date : 18/10/23

Practical No : 7

Title of the Practical : Thermal Analysis of 2D plate

Sr. No.	Roll No	Name of Student	Comprehension (04)	Accuracy / Appropriateness / Presentation (04)	Punctuality (02)	Total (10 Marks)	Signature of Student
1	ME4201	ADHANE ABHISHEK SANJAY	03	03	02	08	Abhishek
2	ME4202	AHIRRAO SAMBHAJI SHIVAJI	03	03	02	08	Shivrao
3	ME4203	BAGUL AJIT KADUBA	02	02	02	06	Ganesh
4	ME4204	BANSOD VARAD SUBHASH	03	02	02	07	Varad
5	ME4205	BAPAT SUMEDH SUNIL	02	03	02	07	Sumedh
6	ME4206	BHAKARE YASH SATISH	03	03	02	08	Yash
7	ME4207	BHALE RAVI BABAN	02	03	02	07	Ravi
8	ME4208	BHALE SHUBHAM BALASAHEB	03	02	02	07	Shubham
9	ME4209	BURKULE VARAD MADHUKAR	03	04	02	09	Varad
10	ME4210	CHAUDHARI VINOD ADITYA	03	03	02	08	Vinod
11	ME4211	CHAVAN ABHIJEET SHIVAJI	02	03	02	07	Abhi
12	ME4212	CHAVAN TUSHAR JITENDRA	02	03	02	07	Tushar
13	ME4213	CHOUNDIYE VISHAL OMPRAKASH	04	03	02	09	Vishal
14	ME4214	CHOUNDIYE YASH LAXMINARAYAN	03	04	02	09	Yash
15	ME4215	DANDAGE VINAY GANESH	04	04	02	10	Vinay

A.J. Punevale  
Name & Signature of Practical Faculty

B.Tech Co-ordinator

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Department of Mechanical Engineering  
Practical Evaluation Sheet

Class B.Tech B

Lab : ANSYS

Subject : ANSYS

Batch : B1

Date : 25/10/23

Practical No : 8

Title of the Practical : Thermal Analysis of 2D plate with Internal heat Generation

Sr. No.	Roll No	Name of Student	Comprehension (04)	Accuracy / Appropriateness / Presentation (04)	Punctuality (02)	Total (10 Marks)	Signature of Student
1	ME4201	ADHANE ABHISHEK SANJAY	04	03	02	09	Abhishek
2	ME4202	AHIRRAO SAMBHAJI SHIVAJI	04	04	02	10	Shivrao
3	ME4203	BAGUL AJIT KADUBA	03	03	02	08	Ganesh
4	ME4204	BANSOD VARAD SUBHASH	02	01	02	05	Varad
5	ME4205	BAPAT SUMEDH SUNIL	04	03	02	09	Sumedh
6	ME4206	BHAKARE YASH SATISH	←	←	←	←	←
7	ME4207	BHALE RAVI BABAN	02	01	02	05	Ravi
8	ME4208	BHALE SHUBHAM BALASAHEB	04	03	02	09	Shubham
9	ME4209	BURKULE VARAD MADHUKAR	04	03	02	09	Varad
10	ME4210	CHAUDHARI VINOD ADITYA	03	03	02	08	Vinod
11	ME4211	CHAVAN ABHIJEET SHIVAJI	←	←	←	←	←
12	ME4212	CHAVAN TUSHAR JITENDRA	←	←	←	←	←
13	ME4213	CHOUNDIYE VISHAL OMPRAKASH	04	03	02	09	Vishal
14	ME4214	CHOUNDIYE YASH LAXMINARAYAN	03	03	02	08	Yash
15	ME4215	DANDAGE VINAY GANESH	←	←	←	←	←

A.J. Punevale  
Name & Signature of Practical Faculty

B.Tech Co-ordinator

HMED