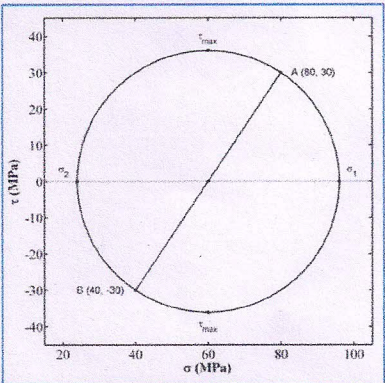


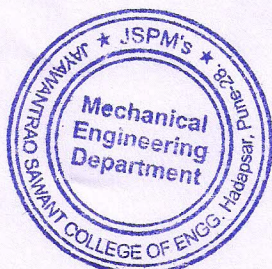
Innovations in Teaching Learning Processes

Name of Method: Problem Based Learning	
Description:- For generating numerical solution of real life or engineering problems, computational thinking can be opted. It is problem based learning process in which problem is formulated, mathematical model is developed or selected and suitable computational/numerical method is implemented to solve the problem. Solution obtained from developed programming logic is testing or validated by suitable means.	
Suggested By : Dr. Pradeep A. Patil	
Can be Reproduced By:- All teachers of Mechanical Department	
Implemented From:- AY 2017-18 (Sem-II)	
Evidences	
<p style="text-align: center;">1. Problem statement</p> <p>a. Determine the volumetric strain in thin cylindrical pressure vessel of given dimensions and material for a specified charging pressure.</p> <p>b. For 2-D stress condition, determine maximum normal and shear stresses alongwith orientation of planes on which they occur. Also transform the plane stress condition on inclined plane with given plane.</p>	<p style="text-align: center;">2. Problem Solving Steps</p> <ol style="list-style-type: none"> 1. Understanding the problem/Problem Definition 2. Problem formulation 3. Apply suitable numerical/ computational method for problem solving 4. Development of programming logic or algorithm for numerical method 5. Develop and execute syntax/program in software 6. Validation of solution 7. Development of user friendly interface.
3. Program and Output	
<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <pre>function [sigma_mohr,tau_mohr,sigma_1,sigma_2,tau_1,tau_2... ,center_circle,phi]=mohr(sigma_x,sigma_y,tau_xy,gridsize) phi=linspace(0,pi,gridsize); sigma_mohr=(sigma_x+sigma_y)/2+(sigma_x-sigma_y)/2*cos(2*phi)+... tau_xy*sin(2*phi); tau_mohr=-(sigma_x-sigma_y)/2*sin(2*phi)+... tau_xy*cos(2*phi); sigma_1=(sigma_x+sigma_y)/2+sqrt(((sigma_x-sigma_y)/2)^2+tau_xy^2); sigma_2=(sigma_x+sigma_y)/2-sqrt(((sigma_x-sigma_y)/2)^2+tau_xy^2); tau_1=sqrt(((sigma_x-sigma_y)/2)^2+tau_xy^2); tau_2=-tau_1; center_circle=(sigma_x+sigma_y)/2; %phi_p=atan(2*tau_xy/(sigma_x-sigma_y))/2; end</pre> </div> <div style="width: 35%;">  </div> </div>	
<p>Outcomes: Following are the outcomes that make Computational Thinking (Problem Based Learning) an effective learning method over traditional</p> <ol style="list-style-type: none"> 1. Increase engagement (Less us and more them) 2. Enhanced problem solving skills 3. Improved logical thinking 4. Improved performance and knowledge 	

Prof. Suvarna Pawar
Prepared /Suggested by

Module Coordinator
Approved by

Dr. P.A.Patil (HOD)
Approved by



Professor & Head
In Mech. Engg. Department
JSPM's Jaywantrao Sawant College of Engineering
Hadapsar, Pune- 411 028