JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA–533003, Andhra Pradesh, India
DEPARTMENT OF MECHANICAL ENGINEERING

III Year - II Semester		**L**	**T**	**P**	**C**
		0	**0**	**3**	**1.5**
CAE & CAM Lab					

Course objectives:

1) To experiment with trusses and beams to determine stress, deflection, natural frequencies, harmonic analysis, HT analysis and buckling analysis.
2) To demonstrate part programmes using FANUC controller.
3) To generate G-code for automated tool path using CAM software.
4) To demonstrate with rapid prototyping machine and to print simple parts.
5) To experiment with virtual 3D printing simulation using Vlabs.

1. Experiments to determine stresses, deflection, natural frequencies, harmonic analysis, HT analysis and buckling analysis (Any three experiments to be done).
   a) Determination of deflection and stresses in 2D and 3D trusses and beams.
   b) Determination of principal and Von-mises stresses in plane stress, plane strain and axisymmetric components.
   c) Determination of stresses in 3D and shell structures (at least one example in each case)
   d) Estimation of natural frequencies and mode shapes, harmonic response of 2D beam.
   e) Steady state heat transfer analysis of plane and axisymmetric components.
   f) Buckling analysis
2. Study of CNC part programming fundamentals and write part programmes for simple components on CNC lathe and Mill and Study of RP machine. (Any three experiments to be done).
   A. CNC part programming for turned components using FANUC Controller
      (i) Plain turning and facing
      (ii) Step Turning Operation
      (iii) Taper turning
   B. CNC programming for milled components using FANUC Controller
      (i) circular interpolation
      (ii) End milling
      (iii) Pocket milling
3. Automated CNC Tool path and G-Code generation using CAM packages.
4. Study and demonstration of RP machine-creation of simple parts.
5. Virtual 3D Printing Simulation lab using Vlabs.
   https://3dp-dei.vlabs.ac.in/List%20of%20experiments.html

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Course outcomes: Students are expected to learn the concepts and should be able to

CO1: Experiment with trusses and beams to determine stress, deflection, natural frequencies, harmonic analysis, HT analysis and buckling analysis.
CO2: Create part programmes using FANUC controller.
CO3: Apply G-codes for automated tool path using CAM software.
CO4: Analyze about rapid prototyping machine and to print simple parts.
CO5: Experiment with virtual 3D printing simulation using Vlabs.