# B.Tech in Mechanical Engineering

## Department of Mechanical Engineering, Tezpur University

**SYLLABUS**

| **ME214: Kinematics of Machinery** | L-T-P-CH-CR: 2-1-0-3-3 |
|---|---|
| **Prerequisite** | Engineering Mechanics (ME102) |

_Introduction_: Basic kinematic concepts; Kinematic Pairs; Plane and Space Mechanisms; Kinematic Chains; Kinematic Diagrams, Limit and Disguise of Revolute Pairs; Kinematic Inversion; Equivalent Linkages; Mobility and Range of Movement.

_Kinematic Analysis of Plane Mechanisms_: Displacement Analysis; Instantaneous Centre of Velocity; Aronhold-Kennedy Theorem of Three Centres; Velocity and Acceleration Analysis (Graphical & Analytical); Velocity and Acceleration Images.

_Dimensional Synthesis of Linkages_: Three Position Synthesis (Graphical Method); Four Position Synthesis (Point-Position Reduction); Dead-Centre Problems; Importance of Chebyshev Accuracy Points in Approximate Synthesis.

_Cams_: Classification of Followers and Cams; Radial Cam Nomenclature; Description of Follower Movement; Analysis of Follower Motion; Determination of Basic Dimensions of Cams.

_Gears_: Gearing Action; Fundamental Law of Gearing; Properties and Characteristics of Involute Action; Introduction to Helical, Spiral, Bevel, and Worm Gears; Gear Trains.

**_Textbooks_**:

1. Ghosh, A., Mallik, A. K., _Theory of Mechanisms and Machines_, Third Edition, EWP publications, New Delhi, Reprint 2014.

2. Rattan, S. S., _Theory of Machines_, MacGraw Hill Education, New Delhi, 2014.

**_Reference books_**:

1. Rao, J. S., Dukkipati R. V., _Mechanism and Machine Theory_, New Age International Publishers, New Delhi, 2006.

2. Bevan, T., _The Theory of Machines_, Pearson, New Delhi, Third edition, 2014.

3. Uicker, J.J., Pennock, G. R. and Shigley, J. E., _Theory of Machines and Mechanisms_, Oxford University Press, New Delhi, Third edition, 2007.