**STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI**

**Course Schedule: November 2023 - April 2024**

**Department : Mathematics**

**Names of the Faculty : Dr Chinthamani S (6 Hours)**

**Course Title : Principles of Mechanics**

**Course Code : 19MT/MC/PM65**

**Shift : I**

| Week & No. of hours | Units & Topics | Teaching Methodology | Text & References | Method of Evaluation |
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| Nov 22 – 23, 2023 (Day Order 1 & 2) (CM – 2 Hrs) | **UNIT 1: FORCES ACTING ON A PARTICLE**<br>1.1 Forces | Lecture & Group discussion | Dharmapadam A.V. Statics, Chennai: S. Viswanathan, 2006. | Short Q/A |
| Nov 24-30, 2023 (Day Order 1 to 6) (CM – 6 Hrs) | **UNIT 1: FORCES ACTING ON A PARTICLE**<br>1.2 Types of Forces<br>1.3 Parallelogram Law of Forces<br>1.4 Triangle Law of Forces | Lecture & Group discussion | Dharmapadam A.V. Statics, Chennai: S. Viswanathan, 2006. | Quiz |
| Dec 1-7, 2023 (Day Order 1 to 6) (CM – 6 Hrs) | **UNIT 1: FORCES ACTING ON A PARTICLE**<br>1.5 Polygon Law of Forces<br>1.6 Lami's Theorem | Lecture & Group discussion | Dharmapadam A.V. Statics, Chennai: S. Viswanathan, 2006. | Summary |
| Dec 8-9, 2023 (Day Order 1, 3) (CM – 3 Hrs) | **UNIT 1: FORCES ACTING ON A PARTICLE**<br>1.7 Conditions of Equilibrium of any Number of Forces Acting on a Particle<br>**UNIT 2: NON-CONCURRENT COPLANAR FORCES**<br>2.1 Moment of a Force about a Point and a Line | Lecture & Group discussion | Dharmapadam A.V. Statics, Chennai: S. Viswanathan, 2006. | Discussion |
| Dec 11-15, 2023 (Day Order 2 to 6) (CM – 5 Hrs) | **UNIT 2: NON-CONCURRENT COPLANAR FORCES**<br>2.2 Parallel Forces<br>2.3 Varignon's Theorem | Lecture & Group discussion | Dharmapadam A.V. Statics, Chennai: S. Viswanathan, 2006. | Quiz |

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| Dec 16 – 22, 2023<br>(Day Order 1 to 6)<br>(CM – 6 Hrs) | **UNIT 2: NON-CONCURRENT COPLANAR FORCES**<br>2.4 Couples<br>2.5 Properties of Couples<br>2.6 Coplanar Forces | Lecture & Group discussion | Dharmapadam A.V. Statics, Chennai: S. Viswanathan, 2006. | III COMPONENT<br>Written Test (20marks)<br>Portion: Unit 1 |
| Jan 3 – 6, 2024<br>(Day Order 1 to 4)<br>(CM – 4 Hrs) | **UNIT 2: NON-CONCURRENT COPLANAR FORCES**<br>2.7 Reduction of any Coplanar System of Forces<br>2.8 Conditions of Equilibrium | Lecture & Group discussion | Dharmapadam A.V. Statics, Chennai: S. Viswanathan, 2006. | Quiz |
| Jan 8 – 12, 2024 | **C.A. Test – I** [Portion: Unit 1 & Unit 2: sections 2.1 to 2.6] | | | |
| Jan 13, 2024<br>(Day Order 1)<br>(CM – 1 Hr) | **UNIT 2: NON-CONCURRENT COPLANAR FORCES**<br>2.8 Conditions of Equilibrium (Contd) | Lecture & Group discussion | Dharmapadam A.V. Statics, Chennai: S. Viswanathan, 2006. | Summary |
| Jan 18 -20, 2024<br>(Day Order 4 to 6)<br>(CM – 3 Hrs) | **UNIT 2: NON-CONCURRENT COPLANAR FORCES**<br>2.9 Equilibrium of Three Forces Acting on a Rigid Body<br>**UNIT 3: FRICTION**<br>3.1 Laws of Statical Friction | Lecture & Group discussion | Dharmapadam A.V. Statics, Chennai: S. Viswanathan, 2006.<br>Dharmapadam A.V. Dynamics, Chennai: S. Viswanathan, 2006. | Quiz |
| Jan 22-29, 2024<br>(Day Order 1 to 6)<br>(CM – 6 Hrs) | **UNIT 3: FRICTION**<br>3.2 Coefficient of Friction<br>3.3 Angle of Friction<br>3.4 Cone of Friction | Lecture & Group discussion | Dharmapadam A.V. Dynamics, Chennai: S. Viswanathan, 2006. | Short Q/A |
| Jan 30 – Feb 2, 2024<br>(Day Order 1 to 4)<br>(CM – 4 Hrs) | **UNIT 3: FRICTION**<br>3.5 Law of Kinetic Friction<br>3.6 Equilibrium of a Particle on an Inclined Plane | Lecture & Group discussion | Dharmapadam A.V. Dynamics, Chennai: S. Viswanathan, 2006. | Slip test |
| Feb 3, 2024<br>(Day Order 2)<br>(CM – 1 Hr) | **UNIT 3: FRICTION**<br>3.7 Condition for Sliding and Toppling | Lecture & Group discussion | Dharmapadam A.V. Dynamics, Chennai: S. Viswanathan, 2006. | Summary |
| Feb 5- 6, 2024<br>(Day Order 5 to 6) | **UNIT 3: FRICTION**<br>3.7 Condition for Sliding | Lecture & Group discussion | Dharmapadam A.V. Dynamics, Chennai: S. | Oral test |

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| (CM – 2 Hrs) | and Toppling (Contd) | | Viswanathan, 2006. | |
| Feb 7 – 14, 2024<br>(Day Order 1 to 6)<br>(CM – 6 Hrs) | **UNIT 4: EQUILIBRIUM OF STRINGS AND CHAINS**<br>4.1 Equilibrium of Strings and Chains<br>4.2 Common Catenary | Lecture & Group discussion | Dharmapadam A.V. Dynamics, Chennai: S. Viswanathan, 2006. | III Component Presentation (20marks) |
| Feb 15 – 22, 2024<br>(Day Order 1 to 6)<br>(CM – 6 Hrs) | **UNIT 4: EQUILIBRIUM OF STRINGS AND CHAINS**<br>4.3 Suspension Bridge<br>**Linear Motion in a Resisting Medium**<br>4.4 Equations of Motion of a Particle Falling under Gravity in a Resisting Medium under Law of Resistance $mkv$, $mkv^2$ | Lecture & Group discussion | Dharmapadam A.V. Dynamics, Chennai: S. Viswanathan, 2006. | Slip test |
| Feb 23 – 24, 2024<br>(Day Order 1 & 5)<br>(CM – 2 Hrs) | **UNIT 4: EQUILIBRIUM OF STRINGS AND CHAINS-**<br>**Linear Motion in a Resisting Medium**<br>4.5 Limiting Velocity | Lecture & Group discussion | Dharmapadam A.V. Dynamics, Chennai: S. Viswanathan, 2006. | Quiz |
| Feb 26 – Mar 1, 2024<br>(Day Order 2 to 6)<br>(CM – 5 Hrs) | **UNIT 5: RIGID BODY DYNAMICS**<br>5.1 Moment of Inertia<br>5.2 Theorem of Parallel and Perpendicular Axes (statements only)<br>5.3 Moment of Inertia of Simple Standard Bodies | Lecture & Group discussion | Dharmapadam A.V. Dynamics, Chennai: S. Viswanathan, 2006. | III Component Assignment (10marks)<br>Portion: Unit |
| Mar 2, 2024<br>(Day Order 1)<br>(CM – 1 Hr) | **UNIT 5: RIGID BODY DYNAMICS**<br>5.4 Motion of a Rigid Body | Lecture & Group discussion | Dharmapadam A.V. Dynamics, Chennai: S. Viswanathan, 2006. | Short Q/A |
| Mar 4 –8, 2024 | **C.A. Test – II** [Portion: Unit 3 & Unit 4: sec 4.1 to 4.4] | | | |
| Mar 9 – 16, 2024<br>(Day 6 & Day Order 1 to 6)<br>(CM – 7 Hrs) | **UNIT 5: RIGID BODY DYNAMICS**<br>5.5 Rotation about a Fixed Axis<br>5.6 Expressions for Kinetic Energy<br>5.7 Angular Momentum | Lecture & Group discussion | Dharmapadam A.V. Dynamics, Chennai: S. Viswanathan, 2006. | Oral test |
| Mar 18 - 19, 2024<br>(Day Order 2 to | **UNIT 5: RIGID BODY DYNAMICS** | Lecture & Group discussion | Dharmapadam A.V. Dynamics, Chennai: S. | Quiz |

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| 3)<br>(CM – 2 Hrs) | 5.8 Equation of Motion | | Viswanathan, 2006. | |
| Mar 20-22, 2024<br>(Day Order 4 to 6)<br>(CM – 3 Hrs) | **REVISION** | | | |