

ASIAN SCHOOL OF TECHNOLOGY, KHORDHA
ACADEMIC LESSON PLAN (SUMMER 2026)
TH-1 Theory of Machines & Mechanism (COURSE CODE: MEPC202)

Discipline: Mechanical Engineering	Semester: 4 th Sem	Name of the Teaching Faculty : SUDHIR KUMAR MAHAPATRA
Subject: TH-1 (Theory Of Machine & Mechanism)	No. of days/per week class allotted:3p/week	Semester From: 5 th January to 18 th April 2026 No.ofWeeks:15 weeks
Week	Class Day	Theory Topics
1st	1st	Unit I: Simple Mechanism Link, kinematic pair and types (Lower pair & higher pair)
	2nd	Kinematic chain, mechanism, inversion
	3rd	Four bar link mechanism and its inversions
2nd	1st	Unit I: Cams and Followers Concept, definition and applications of cams and followers
	2nd	Classification of cams and followers
	3rd	Follower motions: uniform velocity, SHM, uniform acceleration/retardation; displacement diagrams
3rd	1st	Unit II: Power Transmission – Belt Drives Types of drives: Belt, Chain, Rope, Gear drives & comparison
	2nd	Belt Drives: flat belt, V-belt & applications; materials for belts
	3rd	Angle of lap, belt length; slip and creep
4th	1st	Determination of velocity ratio, ratio of tight side and slack side tension
	2nd	Centrifugal tension and initial tension
	3rd	Condition for maximum power transmission; simple numericals
5th	1st	Unit II: Chain Drives Advantages & disadvantages; selection of chain & sprocket wheels
	2nd	Methods of lubrication
	3rd	Unit II: Gear Drives Spur gear terminology; types of gears
6th	1st	Gear trains; selection for different applications
	2nd	Train value & velocity ratio for compound, reverted and simple epicyclic gear train
	3rd	Methods of lubrication; law of gearing
7th	1st	Unit II: Rope Drives Types, applications, advantages & limitations of steel ropes
	2nd	Unit III: Flywheel and Governors Flywheel: concept, function, application; turning moment diagram for single cylinder 4-stroke IC engine
	3rd	Coefficient of fluctuation of energy, coefficient of fluctuation of speed and significance
8th	1st	Unit III: Governors Types: Centrifugal, Watt, Porter (with sketches)
	2nd	Concept, function, applications & terminology: sensitivity, stability, isochronism
	3rd	Simple numerical on Watt and Porter Governor; comparison between flywheel and governor
9th	1st	Unit IV: Brakes, Dynamometers, Clutches & Bearings Function of brakes and dynamometers; types; comparison
	2nd	Construction & working: shoe brake, band brake
	3rd	Numerical problems: braking force and braking torque for shoe & band brakes
10th	1st	Concept of self-locking & self-energizing brakes
	2nd	Construction & working: rope brake dynamometer, hydraulic dynamometer
	3rd	Unit IV: Clutches Uniform pressure and uniform wear theories; function & applications
11th	1st	Construction & working: single plate clutch, multi plate clutch
	2nd	Construction & working: centrifugal clutch, cone clutch, diaphragm clutch
	3rd	Simple numericals on single and multi plate clutch
12th	1st	Unit IV: Bearings Simple pivot, collar bearing, conical pivot
	2nd	Torque & power lost in friction; simple numerical
	3rd	Unit V: Balancing & Vibrations

		Concept of balancing; balancing of single rotating mass
13th	1st	Graphical method for balancing several masses revolving in same plane
	2nd	Concept and terminology in vibrations; causes of vibrations in machines
	3rd	Harmful effects of vibrations and remedies
14th	1st	Revision: Units I & II
	2nd	Revision: Units III & IV
	3rd	Revision: Unit V; doubt clearing session
15th	1st	Model test / assessment
	2nd	Problem-solving session
	3rd	Course conclusion & feedback

Sudhin Kumar Mahapatra
Signature of Teaching Faculty

ASIAN SCHOOL OF TECHNOLOGY, KHORDHA
ACADEMIC LESSON PLAN (SUMMER 2026)
TH-2 Thermal Engineering-II (COURSE CODE: MEPC204)

Discipline: Mechanical Engineering	Semester: 4 th Sem	Name of the Teaching Faculty : PRIYARANJAN PATTANAIK
Subject: TH-2 (Thermal Engineering-II)	No. of days/per week class allotted:3p/week	SemesterFrom:05 th JAN 2026 to 18 th APRIL 2026 No. of Weeks:15 weeks
Week	Class Day	Theory Topics
1st	1st	Unit I: Gas Turbines 1.1 Introduction to Gas Turbines, Air-standard Brayton cycle
	2nd	1.2 Gas Turbine Classification: Open cycle and Closed cycle gas turbines
	3rd	1.3 Comparison with IC engines & steam turbines; Applications & limitations
2nd	1st	1.4 Open cycle constant pressure gas turbine; P-V & T-S diagrams
	2nd	1.5 Closed cycle gas turbine; P-V & T-S diagrams
	3rd	Unit I: Jet Propulsion 1.6 Principle of jet propulsion; Fuels used
3rd	1st	1.7 Applications of jet propulsion; Working of turbojet engine
	2nd	1.8 Principle of Ram effect; Working of Ram jet engine
	3rd	1.9 Rocket propulsion; Working of rocket engine
4th	1st	1.10 Applications of rocket propulsion; Comparison of jet & rocket
	2nd	Unit II: Properties of Steam 2.1 Formation of steam; Industrial uses; Basic definitions
	3rd	2.2 Definitions continued: Dryness fraction, superheated steam, etc.
5th	1st	2.3 Determination of enthalpy, internal energy, entropy using steam tables
	2nd	2.4 Steam processes: Isochoric, Isobaric, Hyperbolic
	3rd	2.5 Steam processes: Isothermal, Isentropic, Throttling, Polytropic
6th	1st	2.6 Steam calorimeters: Separating & throttling calorimeters
	2nd	2.7 Combined Separating & throttling calorimeters - problems
	3rd	Unit III: Steam Generators 3.1 Function & classification of boilers
7th	1st	3.2 Cochran & Babcock and Wilcox boilers
	2nd	3.3 Comparison of water tube & fire tube boilers
	3rd	3.4 Modern high-pressure boilers: La Mont & Benson boilers
8th	1st	3.5 Boiler mountings: Pressure gauge, water level indicator, fusible plug, etc.
	2nd	3.6 Boiler mountings: Safety valves, stop valve, alarms
	3rd	3.7 Boiler accessories: Feed pump, economizer, super heater, air pre heater
9th	1st	3.8 Steam traps & separators; Boiler performance terms
	2nd	3.9 Boiler efficiency; Simple problems
	3rd	3.10 Draught systems: Natural, forced & induced
10th	1st	Unit IV: Steam Nozzles 4.1 Flow of steam through nozzle; Velocity using heat drop (analytical)
	2nd	4.2 Velocity using Mollier chart; Discharge of steam
	3rd	4.3 Critical pressure ratio; Calculation of cross-sectional areas
11th	1st	4.4 Effect of friction; Super saturated flow
	2nd	4.5 Steam jet injector; Simple numerical problems
	3rd	Unit V: Steam Turbines 5.1 Classification; Difference between impulse & reaction turbines
12th	1st	5.2 Simple impulse turbine; Velocity diagrams; Work done, thrusts
	2nd	5.3 Blade efficiency, diagram efficiency, stage efficiency
	3rd	5.4 Compounding for velocity, pressure & pressure-velocity

13th	1st	5.5 Parson's Reaction turbine; Velocity diagrams
	2nd	5.6 Problems on single stage impulse turbine
	3rd	5.7 Problems on reaction turbine
14th	1st	5.8 Bleeding & re-heating; Governing of steam turbines
	2nd	Revision Unit I & II
	3rd	Revision Unit III & IV
15th	1st	Revision Unit V
	2nd	Model Test / Assessment
	3rd	Feedback & Course Conclusion

Pradyumn Pattnaik
Signature of Teaching Faculty

ASIAN SCHOOL OF TECHNOLOGY, KHORDHA
ACADEMIC LESSON PLAN (SUMMER 2026)
TH-3 Computer Integrated Manufacturing (COURSE CODE: MEPC206)

Discipline: Mechanical Engineering	Semester: 4 th Sem	Name of the Teaching Faculty : Gopabandhu Swain
Subject: TH-3 (Computer Integrated Manufacturing)	No. of days/per week class allotted:3p/week	Semester From: 05 th JAN 2026 to 18 th APRIL 2026 No. of Weeks:15 weeks
Week	Class Day	Theory Topics
1st	1st	Unit I: Concept of CIM 1.1 Introduction to CIM, Basic components of CIM
	2nd	1.2 Distributed database system for manufacturing
	3rd	1.3 Distributed communication system
2nd	1st	1.4 Computer networks for manufacturing (Part 1)
	2nd	1.5 Computer networks for manufacturing (Part 2)
	3rd	1.6 Future automated factory
3rd	1st	1.7 Social factors in CIM implementation
	2nd	1.8 Economic factors in CIM implementation
	3rd	Unit I Revision & Problem Solving
4th	1st	Unit II: Computer Aided Design (CAD) 2.1 CAD hardware components
	2nd	2.2 CAD software systems
	3rd	2.3 Product modeling techniques
5th	1st	2.4 Automatic drafting systems
	2nd	2.5 Engineering analysis in CAD
	3rd	2.6 Finite Element Method (FEM) in design
6th	1st	2.7 Design review and evaluation
	2nd	2.8 Group Technology concepts
	3rd	2.9 Group Technology Centre organization
7th	1st	Unit II Revision & Applications
	2nd	Unit III: Computer Aided Manufacturing (CAM) 3.1 Introduction to CAM systems
	3rd	3.2 Computer assisted NC part programming
8th	1st	3.3 NC programming for plain turning operations
	2nd	3.4 NC programming for step turning operations
	3rd	3.5 Computer assisted robot programming
9th	1st	3.6 Computer Aided Process Planning (CAPP)
	2nd	3.7 Material Requirements Planning (MRP)
	3rd	3.8 Computer aided MRP implementation
10th	1st	Unit III Revision & Case Studies
	2nd	Unit IV: Production Planning & FMS 4.1 Computer aided production scheduling
	3rd	4.2 Computer aided inspection planning
11th	1st	4.3 Computer aided inventory planning
	2nd	4.4 Flexible Manufacturing System (FMS) introduction
	3rd	4.5 Concept of flexible manufacturing
12th	1st	4.6 FMS components and layout
	2nd	4.7 FMS planning and implementation
	3rd	Unit IV Revision & Industry Applications
13th	1st	Unit V: Integration & Quality Control

		5.1 Integrating NC machines in CIM
	2nd	5.2 Integrating robots in CIM systems
	3rd	5.3 Integrating AGVs and other NC equipment
14th	1st	5.4 Computer aided quality control systems
	2nd	5.5 Business functions in CIM
	3rd	5.6 Computer aided forecasting
15th	1st	5.7 Office automation in CIM environment
	2nd	Unit V Revision & Complete System Integration
	3rd	Course Review, Model Test & Feedback

Gopabandhu Swain
Signature of Teaching Faculty

ASIAN SCHOOL OF TECHNOLOGY, KHORDHA

ACADEMIC LESSON PLAN (SUMMER 2026)

TH-4 (a) Refrigeration And Air Conditioning (COURSE CODE: MEPE202(a))

Discipline: Mechanical Engineering	Semester: 4 th Sem	Name of the Teaching Faculty: Sujaya Kumar Sahu
Subject: TH-4(a) (RAC)	No. of days/per week class allotted:3p/week	Semester From: 5 th January to 18 th April 2026 No.of Weeks:15 weeks
Week	Class Day	Theory Topics
1st	1st	Unit I: Introduction to Refrigeration Definition of Refrigeration; Refrigerating effect; Unit of refrigeration; Coefficient of performance
	2nd	Types of Refrigeration: Ice, dry ice, Steam jet, Throttling, Liquid nitrogen refrigeration
	3rd	Carnot refrigeration Cycle
2nd	1st	Air refrigeration: Bell-Coleman cycle, P-V & T-S diagrams
	2nd	Advantages and disadvantages of air refrigeration
	3rd	Simple problems on refrigeration cycles
3rd	1st	Unit II: Refrigeration systems Basic Components; Flow diagram of Vapour compression cycle
	2nd	Representation of vapour compression cycle on P-H, T-S & P-V diagrams
	3rd	Expression for Refrigerating effect, work done and power required
4th	1st	Types of Vapour Compression cycles
	2nd	Effects of superheating and undercooling; advantages and disadvantages
	3rd	Simple Vapour absorption cycle and flow diagram
5th	1st	Simple Electrolux system for domestic units
	2nd	Comparison of Vapour absorption and vapour compression systems
	3rd	Simple problems on vapour compression cycle
6th	1st	Unit III: Refrigeration equipment Compressor: types of compressors; Hermetically sealed and Semi-hermetically sealed compressor
	2nd	Condensers: Air Cooled, water cooled, natural and forced draught cooling systems
	3rd	Advantages and disadvantages of air cooled and water cooled condensers
7th	1st	Evaporators: natural, convection, forced convection types
	2nd	Unit IV: Refrigerant flow controls Capillary tube; Automatic Expansion valve; Thermo-static expansion valve
	3rd	High side and low side float valve; Solenoid valve; Evaporator pressure regulator
8th	1st	Unit IV: Application of refrigeration Slow and quick freezing; Cold storage and Frozen storage
	2nd	Dairy refrigeration; Ice making industry; Water coolers
	3rd	Unit V: Air conditioning Introduction to Air conditioning; Factors affecting Air conditioning
9th	1st	Psychrometric chart and its use
	2nd	Psychrometric processes: sensible heating and cooling, Humidifying and dehumidifying
	3rd	Adiabatic saturation process
10th	1st	Equipment used in air conditioning cycle
	2nd	Air conditioning units and plants
	3rd	Tools used in refrigeration and Air conditioner installation
11th	1st	Installation procedure for refrigeration and air conditioning systems
	2nd	Faults in refrigeration and air conditioning systems
	3rd	Servicing procedure
12th	1st	Revision: Units I & II
	2nd	Revision: Units III & IV
	3rd	Revision: Unit V
13th	1st	Problem solving session (Numerical problems)
	2nd	Doubt clearing session
	3rd	Model Test / Assessment
14th	1st	Course review and important concepts
	2nd	Industry applications and case studies
	3rd	Feedback session

15th	1st	Reserve/Extra class if needed
	2nd	Reserve/Extra class if needed
	3rd	Course conclusion

Sujaya Kumar Sahu
Signature of Teaching Faculty

ASIAN SCHOOL OF TECHNOLOGY, KHORDHA
ACADEMIC LESSON PLAN (SUMMER 2026)
TH-5(c) Mechatronics (COURSE CODE: MEPE204(c))

Discipline: Mechanical Engineering	Semester: 4 th Sem	Name of the Teaching Faculty: Rajendra Sethy
Subject: TH-5(c) Mechatronics	No. of days/per week class allotted: 3p/week	Semester From: 05 th JAN 2026 to 18 th APRIL 2026 No. of Weeks: 15 weeks
Week	Class Day	Theory Topics
1st	1st	Unit I: Introduction to Mechatronics Mechatronics; Importance of Mechatronics; Systems: Measurement systems; Control systems
	2nd	Control systems types; Closed-loop control System; Automatic water level controller
	3rd	Sequential controllers: washing machine; Measurement System terminology
2nd	1st	Displacement, Position & Proximity Sensors
	2nd	Velocity and Motion Sensors; Force Sensors
	3rd	Fluid Pressure Sensors; Flow Sensors; Liquid Level Sensors
3rd	1st	Temperature Sensors; Light Sensors; Selection of Sensors
	2nd	Unit II: Mechanical Actuation Systems Types of motion; Freedom and constraints; Loading; Gear Trains
	3rd	Pawl & Ratchet; Belt & Chain drives; Bearings; Selection
4th	1st	Ball & Roller bearings; Mechanical aspects of motor selection
	2nd	Unit II: Electrical Actuation Systems Switches & Relays; Solenoids; D.C Motors; A.C. Motors
	3rd	Stepper Motors; Specifications and Control of stepper motors
5th	1st	Servomotors; D.C Servomotor and A.C Servomotor
	2nd	Unit II: Pneumatic & Hydraulic Systems Power supplies; DCV; PCV; Cylinders; Rotary actuators
	3rd	Unit III: Mathematical Model Introduction to Mathematical model; Mechanical System building blocks
6th	1st	Electrical System building blocks; Fluid System building blocks
	2nd	Thermal System building blocks
	3rd	Unit III: System Model Engineering Systems: Rotational, Translational Systems
7th	1st	Electro-Mechanical System; Hydro-Mechanical System
	2nd	Unit IV: Input/Output Systems Interfacing; Input/output ports; Interface requirements: Buffers, Handshaking
	3rd	Polling and interrupts, Serial interfacing; Introduction to PIA
8th	1st	Serial communications interface; Example of interfacing of a seven-segment display with decoder
	2nd	Unit IV: Programmable Logic Controller (PLC) Definition; Basic block diagram and structure of PLC; Input/Output processing
	3rd	PLC Programming: Ladder diagram, its logic functions, Latching and Sequencing
9th	1st	PLC mnemonic: Timers; Internal relays and Contacts; Unit registers
	2nd	Master and Jump Controls; Data handling; Analog input/output; Selection of PLC
	3rd	Unit V: Design Examples & Advanced Applications in Mechatronics Design process stages; Traditional Vs Mechatronics designs
10th	1st	Possible design solutions: Timed switch, Wiper motion, Bathroom scale
	2nd	Case studies: Pick-and-place robot, Car park barrier
	3rd	Case studies: Car engine management system, Automatic Camera, Automatic Washing Machine
11th	1st	Sensors for Condition Monitoring Systems of Production Systems
	2nd	Examples of Monitoring methods: Vibration monitoring, Temperature monitoring, Wear behavior monitoring
	3rd	Mechatronics control in automated manufacturing: Monitoring of Manufacturing processes
12th	1st	On-line quality monitoring, Model based systems, Hardware in-the-loop simulation
	2nd	Supervisory control in manufacturing inspection, Integration of heterogeneous systems

	3rd	Revision: Units I & II
13th	1st	Revision: Units III & IV
	2nd	Revision: Unit V; Problem solving session
	3rd	Model Test / Assessment
14th	1st	Doubt clearing session
	2nd	Course review and important concepts
	3rd	Industry applications and case studies
15th	1st	Feedback session
	2nd	Course conclusion
	3rd	Reserve/Extra class if needed

Rajendra Saty

Signature of Teaching Faculty