ASIAN SCHOOL OF TECHNOLOGY, KHORDHA

ACADEMIC LESSON PLAN (WINTER-2026)

TH-1 DIGITAL ELECTRONICS AND MICROPROCESSOR (COURSE CODE: EEPC301)

Discipline: Electrical Engineering	Semester :5TH	No. of periods available: 45	Name of Teaching Faculty**: ARUNA SATAPATHY**
Subject: Digital Electronics & Microprocessor	No. of Days/ per week class allotted : 3periods /week		Semester from: 02.07.2026 To 05.11.2026 No. of weeks : 15
Week	Class Day		Theory Topics
1st	1st	1	**UNIT:1 Digital Fundamentals** Number Systems and Conversions, Decimal, Octal, Hexadecimal,
	2nd	1	Binary Arithmetic, 1's and 2's complements, Codes – Binary, BCD, Excess 3, Gray
	3rd	1	Boolean Algebra Basics , Logic gates and truth tables, Universal gates, Sum of products and product of sums, Minterms and Maxterms,
2nd	4th	1	SOP and POS Forms
	5th	1	Karnaugh Map Simplification
	6th	1	Quine-McCluskey Method, Unit I Practice
3rd	7th	1	**UNIT:2 Combinational & Synchronous** Sequential Circuits
	8th	1	Half Adder & Full Adder
	9th	1	Half Subtractor & Full Subtractor Decoder Binary Parallel Adder
4th	10th	1	Multiplexer
	11th	1	Demultiplexer
	12th	1	Encoder, Flip flops – SR, JK, T, D, design of clocked sequential circuits – Design of Counters- Shift registers, Universal Shift Register.
5th	13th	1	Unit II Practice
	14th	1	Class Test 1 (Units I-II)
	15th	1	UNIT3:Asynchronous Sequential Circuits And

			Memory Devices Stable and Unstable states, output specifications, cycles and races, state reduction
6th	16th	1	Race free assignments, Hazards, Essential Hazards, Pulse mode sequential circuits, Design of Hazard free circuits.
	17th	1	Registers Basic memory structure – ROM -PROM – EPROM – EEPROM –EAPROM, RAM – Static and dynamic
	18th	1	RAM – Programmable Logic Devices – Programmable Logic Array (PLA) Race Around Condition
7th	19th	1	Shift Registers
	20th	1	RAM Organization
	21st	1	ROM Organization PLA/PAL Overview
8th	22nd	1	**UNIT 4: 8085 Processor Hardware**
	23rd	1	Architecture, pin diagram – Functional Building Blocks of Processor
	24th	1	Hardware Architecture, pin diagram – Functional Building Blocks of Processor –
9th	25th	1	Memory organization – I/O ports and data transfer concepts– Timing Diagram – Interrupt
	26th	1	Memory Organization
	27th	1	Instruction Cycle
10th	28th	1	Timing Diagram
	29th	1	Interrupts
	30th	1	Addressing Concepts
11TH	31st	1	Addressing Concepts
	32nd	1	Processor Organization

	33rd	1	Unit IV Practice
12TH	34th	1	Revision
	35th	1	**UNIT5: Programming Processor**
	36th	1	Assembly Language Format
13TH	37th	1	Data Transfer Instructions
	38th	1	Arithmetic Instructions
	39th	1	Logical Instructions Branching Instructions
14TH	40 th	1	Stack Operations
	41 st	1	Subroutines
	42nd	1	8255 Architecture
15th	43rd	1	Operating Modes
	44th	1	Class Test 2 (Units III-V)
	45th	1	Revision 1 (Units I-II)

Arunа Satapathy

Signature of Teaching Faculty

ASIAN SCHOOL OF TECHNOLOGY, KHORDHA

ACADEMIC LESSON PLAN (WINTER-2026)

TH-2 ENERGY CONSERVATION AND AUDIT (COURSE CODE: EEPC 303)

Discipline: Electrical Engineering	Semester :5TH	No. of periods available: 45	Name of Teaching Faculty: **PRODOSH MOHAPATRA**
Subject: Energy Conservation & Audit	No. of Days/ per week class allotted : 3periods /week		Semester from: 02.07.2026 To 05.11.2026 No. of weeks : 15
Week	Class Day		Theory Topics
1st	1st	1	**UNIT 1: Energy Conservation Basics** Energy Scenario: Primary and Secondary Energy, Energy demand and supply, National scenario
	2nd	1	Energy conservation and policy issues, concepts and differences
	3rd	1	Indian Electricity Act and related clauses of Energy Conservation Act
2nd	4th	1	BEE and its role
	5th	1	State Electricity Board and its benefits
	6th	1	Revision of Unit I
3rd	7th	1	**UNIT 2:Energy conservation in Electrical Machines** Energy conservation techniques in induction motor by improving power factor
	8th	1	Matching motor with load Motor rewinding
	9th	1	Minimizing idle time and redundant running of motor
4th	10th	1	Operating in star mode Replacing of motor Replacement by energy efficient motor
	11th	1	Periodic maintenance

			Energy conservation techniques in Transformer
	12th	1	Loading sharing, Parallel operation, Loading techniques Replacement by energy efficient transformers, Periodic maintenance of transformer
5th	13th	1	Energy Conservation Equipment: Soft starters, Automatic star delta converter
	14th	1	Variable Frequency Drives, Automatic power factor controller (APFC)
	15th	1	Intelligent motor control, D.G. set controllers, Energy efficient transformers, Energy efficient lighting systems
6th	16th	1	Energy efficient motors, Energy efficient pumps, Energy efficient compressors, Loss reduction techniques
	17th	1	Revision of Unit II
	18th	1	**Class Test 1 (Units I & II)**
7th	19th	1	**UNIT 3:Energy conservation in Electrical Installation systems** Aggregation technique and connected energy/load
	20th	1	Energy audit, cost analysis and maximum demand
	21th	1	Technical losses, wiring and material to reduce losses
8th	22th	1	Conducting energy audit Preliminary data collection
	23rd	1	Measuring instruments Data collection procedures
	24th	1	Commercial losses
9th	25th	1	Lighting system energy conservation
	26th	1	Energy conservation equipment: Maximum Demand Controller
	27th	1	APFC controller and Energy Saver
10th	28th	1	Revision of Unit III

	29th	1	**UNIT 4: Energy conservation through Cogeneration and Tariff** Energy conservation in Utility concepts
	30th	1	Co-generation and WHR concepts
11TH	31st	1	Energy conservation opportunities and significance
	32nd	1	Co-generation: Concept and classification
	33rd	1	Types of co-generation
12TH	34th	1	Co-generation with gas turbine
	35th	1	Co-generation with steam turbine
	36th	1	Co-generation with combined cycle
13TH	37th	1	Tariff: Types of tariff structure: Special tariffs; Time-off-day tariff, Peak-off-day tariff, Application of tariff system to reduce energy bill.
	38th	1	Power factor tariff, Maximum Demand tariff, Load factor tariff
	39th	1	**UNIT 5:Energy Audit of Electricity System:** Energy audit definition, need and importance, energy manager and energy auditor
14TH	40th	1	Energy audit instruments and their use. Questionnaire for energy audit projects
	41th	1	Energy flow diagram (Sankey diagram), Simple payback period,
	42nd	1	Energy Audit procedure (walk through audit and detailed audit).
15th	43rd	1	Energy Audit report format.
	44th	1	Class Test 2 (Units IV & V)
	45th	1	Revision

Signature of Teaching Faculty

ASIAN SCHOOL OF TECHNOLOGY, KHORDHA

ACADEMIC LESSON PLAN (WINTER-2026)

TH-3 (C) ELECTRICAL TRACTION (COURSE CODE: EEPE301 (C))

Discipline: Electrical Engineering	Semester :5TH	No. of periods available: 45	Name of Teaching Faculty**: ANITA DAS**
Subject: Electrical Traction	No. of Days/ per week class allotted : 3periods /week		Semester from: 02.07.2026 To 05.11.2026 No. of weeks : 15
Week	Class Day		Theory Topics
1st	1st	1	**UNIT 1: Basics of Traction** General description of Electric Traction system in India
	2nd	1	Advantages and Disadvantages of Electric Drive
	3rd	1	Diesel Electric Drive ,Battery Drive
2nd	4th	1	Problems associated with AC traction system and remedies
	5th	1	Voltage balance, current balance, production of harmonics
	6th	1	Induction effect, Metro rail system, features
3rd	7th	1	Revision of Unit I
	8th	1	**Quiz 1 (Unit I)**
	9th	1	**UNIT 2: Power Supply Arrangements Constituents of supply system**
4th	10th	1	Substation: layout, list of equipment and their functions
	11th	1	Feeding post: list of equipment and their functions
	12th	1	Feeding and sectioning arrangements
5th	13th	1	Sectioning and paralleling post
	14th	1	Sub sectioning and paralleling post
	15th	1	Sub sectioning post, Elementary section

6th	16th	1	Major equipment at substation Miscellaneous equipment at control post or switching station
	17th	1	Protection system for traction transformer Protection system for 25 kV catenary construction
	18th	1	Revision of Unit II
7th	19th	1	**Class Test 1 (Units I & II)**
	20th	1	**UNIT 3: Overhead Equipment** Different types of overhead equipment
	21th	1	Pentagonal OHE Catenary Construction
8th	22nd	1	Different types of catenary according to speed limit
	23rd	1	OHE Supporting Structure, Cantilever assembly diagram
	24th	1	Overhead system – Trolley collector, Bow collector
9th	25th	1	Pantograph collector, Types and construction of pantograph
	26th	1	Revision of Unit III
	27th	1	**UNIT 4: Electric Locomotive**
10th	28th	1	Classification and Nomenclature of Electric Locomotive, Block diagram of AC locomotive
	29th	1	Power Circuit of AC locomotive
	30th	1	Equipment (List and Function only) used in auxiliary circuit of AC locomotive
11TH	31st	1	Locoboogie classification according to wheel arrangements
	32nd	1	Maintenance of AC system
	33rd	1	**UNIT 5: Traction Motors and Train Lighting** Desirable characteristics of traction motor
12TH	34th	1	Types of motors used for traction with their characteristics and features
	35th	1	Control of motors used for traction and methods to

			control
	36th	1	Requirements of braking, types of braking
13TH	37th	1	Electric braking, Regenerative braking
	38th	1	Systems of train lighting, Single battery, Double battery parallel block system
	39th	1	SG, HOG, End on generation
14TH	40 th	1	**UNIT 6: Requirements of signalling system, Types of signals,**
	41 st	1	Track circuits, Advantages of remote control, System and network,
	42nd	1	Metro rail-supply systems
15th	43rd	1	Advantages, schemes in India
	44th	1	Quiz 2 (Unit V & VI)
	45th	1	Class Test 2 (Units III, IV, V & VI)

Signature of Teaching Faculty

ASIAN SCHOOL OF TECHNOLOGY, KHORDHA

ACADEMIC LESSON PLAN (WINTER-2026)

TH-4 (a) SWITCHGEAR AND PROTECTION (COURSE CODE: EEPE.303 (a))

Discipline: Electrical Engineering	Semester :5TH	No. of periods available: 45	Name of Teaching Faculty: JAYANTA PANDA
Subject: Switchgear and Protection	No. of Days/ per week class allotted : 3periods /week		Semester from: 02.07.2026 To 05.11.2026 No. of weeks : 15
Week	Class Day		Theory Topics
1st	1st	1	**UNIT 1: Basics of Protection** Necessity, functions of protective system
	2nd	1	Normal and abnormal conditions
	3rd	1	Types of faults and their causes
2nd	4th	1	Protection zones and backup protection
	5th	1	Short circuit fault calculations in lines fed by generators through transformers
	6th	1	Numerical problems on fault calculations
3rd	7th	1	Revision of Unit I
	8th	1	**Quiz 1 (Unit I)**
	9th	1	**UNIT 2: Circuit Interruption devices**
4th	10th	1	Isolators – Vertical break, Horizontal break and Pantograph type
	11th	1	HRC fuses – Construction and working
	12th	1	HRC fuses – Characteristics and applications
5th	13th	1	Arc formation process, Methods of arc extinction (High resistance and Low resistance
	14th	1	Air circuit breakers (ACB) – Construction and working, Air circuit breakers (ACB) – Applications
	15th	1	Re-closure voltage, Re-striking voltage,

			RRRV
6th	16th	1	H.T. circuit breakers – Sulphur hexafluoride (SF_6) breaker, H.T. circuit breakers – Vacuum circuit breaker
	17th	1	H.T. circuit breakers – Working, construction, specifications and applications
	18th	1	L.T. circuit breakers – MCB, L.T. circuit breakers – MCCB, L.T. circuit breakers – ELCB
7th	19th	1	Working and applications of MCB, MCCB and ELCB
	20th	1	Selection of LT and HT circuit breakers
	21st	1	Selection of MCCB for motors, Gas insulated Switchgear
8th	22nd	1	Revision of Unit II
	23rd	1	**Class Test 1 (Units I & II)**
	24th	1	**UNIT 3: Protective Relays** Fundamental quality requirements: Selectivity, Speed, Sensitivity, Reliability, Simplicity, Economy
9th	25th	1	Basic relay terminology
	26th	1	Protective relay: Relay time, Pick up, Reset current, Current setting
	27th	1	Plug setting multiplier, Time setting multiplier
10th	28th	1	Protective relays – Classification and principle of working
	29th	1	Construction and operation of Electromagnetic relay
	30th	1	Construction and operation of Solenoid type relay
11TH	31st	1	Construction and operation of Watt-hour meter type relay, Thermal relay – Block diagram and working
	32nd	1	Distance relay – Block diagram and working, Directional relay – Principle, operation and definite distance relay, Differential relay – Need and operation
	33rd	1	Operation of current and voltage differential relay
12TH	34th	1	**UNIT 4: Protection of Alternator and Transformer** Alternator protection faults, Differential protection, Over current, Earth fault, Overheating and field

			failure, protection
	35th	1	Reverse power protection,
	36th	1	Transformer protection faults, Differential protection, Over current, Earth fault, Overheating protection, Limitations of differential protection
13TH	37th	1	Buchholz relay – Construction, operation, merits and demerits
	38th	1	**UNIT 5: Protection of Motors** Bus-bar and Transmission Line Motor Faults. Short circuit protection.
	39th	1	Overload protection, Single phase preventer. Bus bar and Transmission line Faults on Bus bar and Transmission Lines
14TH	40 th	1	Bus bar protection: Differential and Fault bus protection.
	41 st	1	Transmission line: Over current, Distance and Pilot wire protection.
	42nd	1	Revision of Unit IV & V
15th	43rd	1	Revision
	44th	1	Class Test 2 (Units IV & V)
	45th	1	Revision

Jayanta Panda

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ACADEMIC LESSON PLAN (WINTER-2026)

TH-5 (b) LEADERSHIP AND MANAGEMENT SKILL (COURSE CODE: OE301

Discipline: Electrical Engineering	Semester :5TH	No. of periods available: 45	Name of Teaching Faculty: **HIMADRI TANAYA MOHAPATRA**
Subject: Leadership & Management Skills	No. of Days/ per week class allotted : 3periods /week		Semester from: 02.07.2026 To 05.11.2026 No. of weeks : 15
Week	Class Day		Theory Topics
1st	1st	1	**UNIT 1 :Leadership & Management, concept, principles** – Definition of leadership, management Leadership theories
	2nd	1	Leadership characteristics
	3rd	1	Principles of management
2nd	4th	1	Managerial functions
	5th	1	Leader v/s Manager, Leader/Manager traits and character
	6th	1	Leadership Styles
3rd	7th	1	Leadership theories
	8th	1	Leadership characteristics and Leadership Styles
	9th	1	Principles of management and Managerial functions
4th	10th	1	Quiz – Unit I
	11th	1	**UNIT 2: Human Resource Management: Meaning, Nature**
	12th	1	Human Resource Management: Objectives, Scope
5th	13th	1	Job & Job analysis
	14th	1	Staff Development: Need and Objectives of Staff Development

	15th	1	Staff Development: Approaches
6th	16th	1	Training & development
	17th	1	Organizational Development: Components of OD process
	18th	1	Learning organization
7th	19th	1	Training & development
	20th	1	Organizational Development and Learning organization
	21th	1	Class Test – Units I & II
8th	22nd	1	**UNIT 3: personal disposition ,skill & ability of leaders** Self-awareness, Leadership characteristics, traits
	23rd	1	Leadership skills & abilities, Emotional intelligence & its components, Importance in leadership
	24th	1	Communication skills for effective leadership, Barriers to effective communication
9th	25th	1	Active Listening, Mindful listening
	26th	1	Leading & Mentoring – Influencing & mentoring
	27th	1	**UNIT 4: Leader's role in Motivating, Inspiring and Transformative leadership, nurturing team-work** Goal setting & leadership
10th	28th	1	Transformative Leadership
	29th	1	Vision & envisioning
	30th	1	Motivational role of leader in people management
11TH	31st	1	Group & team
	32nd	1	Team dynamics
	33rd	1	Conflict management
12TH	34th	1	Strategies in managing conflicts
	35th	1	Revision
	36th	1	**UNIT 5: Change Management & Leadership** Models of change

13TH	37th	1	Forces driving change
	38th	1	Change Management – process
	39th	1	Change Management – goal, importance
14TH	40 th	1	The process of change happening in an organization
	41 st	1	Key aspects of leadership in change management
	42nd	1	Responsibilities of a change leader
15th	43rd	1	Models of change and Forces driving change
	44th	1	Group discussion
	45th	1	Class Test – Units III ,IV &V

Himadritanya Mohapatra

Signature of Teaching Faculty