Subject wise Detail Syllabus

(Second semester onwards)

**Undergraduate Degree in Engineering & Technology**

Branch/Course:

COMPUTER SCIENCE & ENGINEERING

ARYABHATTA KNOWLEDGE UNIVERSITY
Chanakya National Law University Campus
Mithapur, Patna-800001 www.akubihar.ac.in

SI. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Basic Science courses	BSC 201	Physics (semi-conductor Physics)	3	1	3	5.5
2	Basic Science courses	BSC 202	Mathematics-II (Probability and Statistics)	3	1	0	4
3	Engineering Science Courses	ESC 201	Basic Electrical Engineering	3	1	2	5
4	Engineering Science Course	ESC 202	Engineering Graphics & Design	1	0	4	3
						Total credits	**17.5**
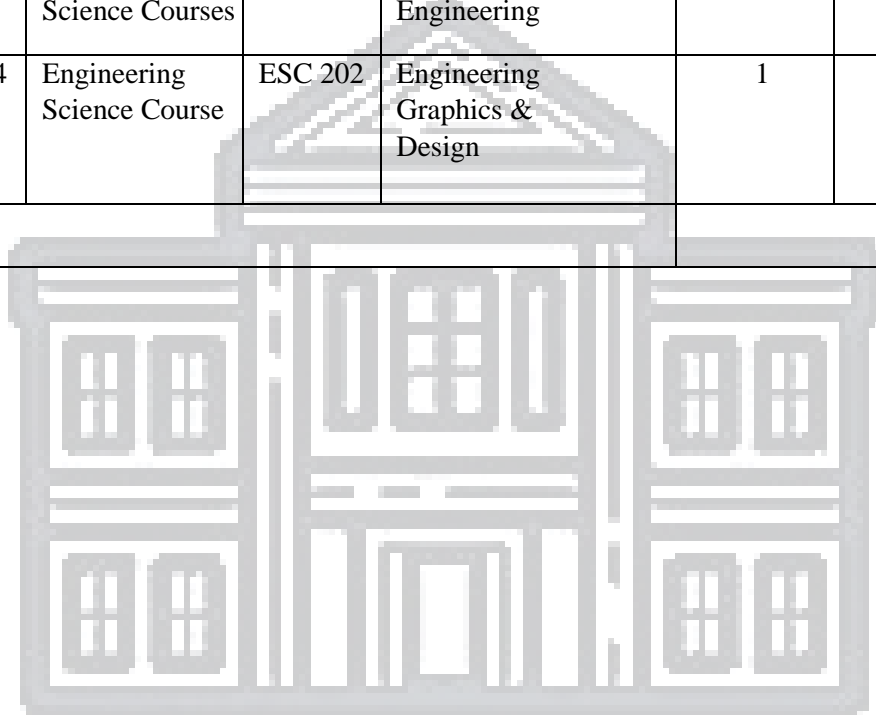
BSC	Physics (Semiconductor Physics)	L:3	T:1	P:3	Credit:5.5

SEMICONDUCTOR OPTOELECTRONICS

PREREQUISITE: SEMICONDUCTOR PHYSICS

MODULE 1: REVIEW OF SEMICONDUCTOR PHYSICS (10 LECTURES)

E-K DIAGRAM, DENSITY OF STATES, OCCUPATION PROBABILITY, FERMI LEVEL AND QUASI-FERMI LEVEL (VARIATION BY CARRIER CONCENTRATION AND TEMPERATURE); P-N JUNCTION, METAL-SEMICONDUCTOR JUNCTION (OHMIC AND SCHOTTKY); CARRIER TRANSPORT, GENERATION, AND RECOMBINATION; SEMICONDUCTOR MATERIALS OF INTEREST FOR OPTOELECTRONIC DEVICES, BANDGAP MODIFICATION, HETEROSTRUCTURES; LIGHT- SEMICONDUCTOR INTERACTION: RATES OF OPTICAL TRANSITIONS, JOINT DENSITY OF STATES, CONDITION FOR OPTICAL AMPLIFICATION.

MODULE 2: SEMICONDUCTOR LIGHT EMITTING DIODES (LEDS) (6 LECTURES)

RATE EQUATIONS FOR CARRIER DENSITY, RADIATIVE AND NON-RADIATIVE RECOMBINATION MECHANISMS IN SEMICONDUCTORS, LED: DEVICE STRUCTURE, MATERIALS, CHARACTERISTICS, AND FIGURES OF MERIT.

MODULE 3: SEMICONDUCTOR LASERS (8 LECTURES)

REVIEW OF LASER PHYSICS; RATE EQUATIONS FOR CARRIER- AND PHOTONDENSITY, AND THEIR STEADY STATE SOLUTIONS, LASER DYNAMICS, RELAXATION OSCILLATIONS, INPUT-OUTPUT CHARACTERISTICS OF LASERS. SEMICONDUCTOR LASER: STRUCTURE, MATERIALS, DEVICE CHARACTERISTICS, AND FIGURES OF MERIT; DFB, DBR, AND VERTICAL- CAVITY SURFACE-EMITTING LASERS (VECSEL), TUNABLE SEMICONDUCTOR LASERS.

MODULE 4: PHOTODETECTORS (6 LECTURES)

TYPES OF SEMICONDUCTOR PHOTODETECTORS -P-N JUNCTION, PIN, AND AVALANCHE AND THEIR STRUCTURE, MATERIALS, WORKING PRINCIPLE, AND CHARACTERISTICS, NOISE LIMITS ON PERFORMANCE; SOLAR CELLS.

MODULE 5: LOW-DIMENSIONAL OPTOELECTRONIC DEVICES (6 LECTURES)

QUANTUM-WELL, -WIRE, AND -DOT BASED LEDS, LASERS, AND PHOTODETECTORS.

SUGGESTED TEXT/REFERENCE BOOKS

- *J. SINGH, SEMICONDUCTOR OPTOELECTRONICS: PHYSICS AND TECHNOLOGY, MCGRAW- HILL INC. (1995).*
- *B. E. A. SALEH AND M. C. TEICH, FUNDAMENTALS OF PHOTONICS, JOHN WILEY & SONS,*
- *S. M. SZE, SEMICONDUCTOR DEVICES: PHYSICS AND TECHNOLOGY, WILEY (2008).*
- *YARIV AND P. YEH, PHOTONICS: OPTICAL ELECTRONICS IN MODERN COMMUNICATIONS, OXFORD UNIVERSITY PRESS, NEW YORK (2007).*
- *P. BHATTACHARYA, SEMICONDUCTOR OPTOELECTRONIC DEVICES, PRENTICE HALL OF INDIA (1997).*
- *ONLINE COURSE: "SEMICONDUCTOR OPTOELECTRONICS" BY M R SHENOY ON NPTEL*
- *ONLINE COURSE: "OPTOELECTRONIC MATERIALS AND DEVICES" BY MONICA KATIYAR AND DEEPAK GUPTA ON NPTEL*
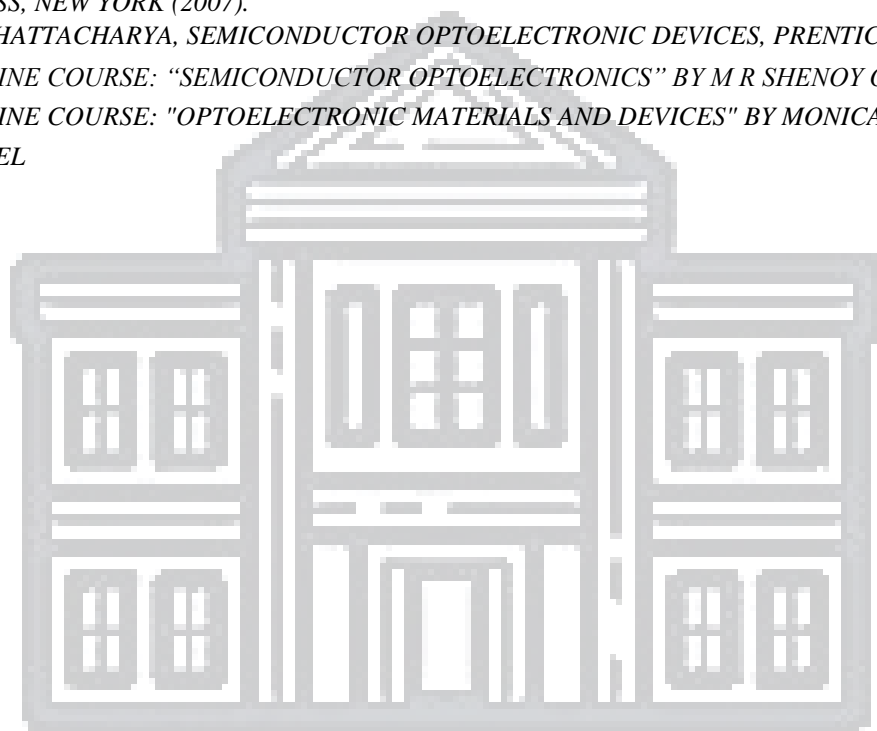
BSC	Mathematics –II (Probability and Statistics)	L:3	T:1	P:0	Credit:4

CONTENTS

MODULE 1: BASIC PROBABILITY (12 LECTURES)

PROBABILITY SPACES, CONDITIONAL PROBABILITY, INDEPENDENCE; DISCRETE RANDOM VARIABLES, INDEPENDENT RANDOM VARIABLES, THE MULTINOMIAL DISTRIBUTION, POISSON APPROXIMATION TO THE BINOMIAL DISTRIBUTION, INFINITE SEQUENCES OF BERNOULLI TRIALS, SUMS OF INDEPENDENT RANDOM VARIABLES; EXPECTATION OF DISCRETE RANDOM VARIABLES, MOMENTS, VARIANCE OF A SUM, CORRELATION COEFFICIENT, CHEBYSHEV'S INEQUALITY.

MODULE 2: CONTINUOUS PROBABILITY DISTRIBUTIONS (4 LECTURES)

CONTINUOUS RANDOM VARIABLES AND THEIR PROPERTIES, DISTRIBUTION FUNCTIONS AND DENSITIES, NORMAL, EXPONENTIAL AND GAMMA DENSITIES.

MODULE 3: BIVARIATE DISTRIBUTIONS (4 LECTURES)

BIVARIATE DISTRIBUTIONS AND THEIR PROPERTIES, DISTRIBUTION OF SUMS AND QUOTIENTS, CONDITIONAL DENSITIES, BAYES' RULE.

MODULE 4: BASIC STATISTICS (8 LECTURES)

MEASURES OF CENTRAL TENDENCY: MOMENTS, SKEWNESS AND KURTOSIS - PROBABILITY DISTRIBUTIONS: BINOMIAL, POISSON AND NORMAL - EVALUATION OF STATISTICAL PARAMETERS FOR THESE THREE DISTRIBUTIONS, CORRELATION AND REGRESSION – RANK CORRELATION.

MODULE 5: APPLIED STATISTICS (8 LECTURES)

CURVE FITTING BY THE METHOD OF LEAST SQUARES- FITTING OF STRAIGHT LINES, SECOND DEGREE PARABOLAS AND MORE GENERAL CURVES. TEST OF SIGNIFICANCE:

LARGE SAMPLE TEST FOR SINGLE PROPORTION,DIFFERENCE OF PROPORTIONS, SINGLE MEAN, DIFFERENCE OF MEANS AND DIFFERENCE OF STANDARD DEVIATIONS.

MODULE 6: SMALL SAMPLES (4 LECTURES)

TEST FOR SINGLE MEAN, DIFFERENCE OF MEANS AND CORRELATION COEFFICIENTS, TEST FOR RATIO OF VARIANCES - CHI-SQUARE TEST FOR GOODNESS OF FIT AND INDEPENDENCE OF ATTRIBUTES.

TEXT / REFERENCES:

- E. KREYSZIG, "ADVANCED ENGINEERING MATHEMATICS", JOHN WILEY & SONS, 2006.
- P. G. HOEL, S. C. PORT AND C. J. STONE, "INTRODUCTION TO PROBABILITY THEORY", UNIVERSAL BOOK STALL, 2003.
- S. ROSS, "A FIRST COURSE IN PROBABILITY", PEARSON EDUCATION INDIA, 2002.
- W. FELLER, "AN INTRODUCTION TO PROBABILITY THEORY AND ITS APPLICATIONS", VOL. 1, WILEY, 1968.
- N.P. BALI AND M. GOYAL, "A TEXT BOOK OF ENGINEERING MATHEMATICS", LAXMI PUBLICATIONS, 2010.
- B.S. GREWAL, "HIGHER ENGINEERING MATHEMATICS", KHANNA PUBLISHERS, 2000. T. VEERARAJAN, "ENGINEERING MATHEMATICS", TATA MCGRAW-HILL, NEW DELHI, 2010

ESC	Basic Electrical Engineering	L:3	T:1	P:2	Credit:5

MODULE 1: DC CIRCUITS (8 LECTURES)

ELECTRICAL CIRCUIT ELEMENTS (R, L AND C), VOLTAGE AND CURRENT SOURCES, KIRCHHOFF CURRENT AND VOLTAGE LAWS, ANALYSIS OF SIMPLE CIRCUITS WITH DC EXCITATION. STAR-DELTA CONVERSION, NETWORK THEOREMS (SUPERPOSITION, THEVENIN, NORTON AND MAXIMUM POWER TRANSFER THEOREMS). TIME-DOMAIN ANALYSIS OF FIRST- ORDER RL AND RC CIRCUITS

MODULE 2: AC CIRCUITS (8 LECTURES)

REPRESENTATION OF SINUSOIDAL WAVEFORMS, PEAK, RMS AND AVERAGE VALUES (FORM FACTOR AND PEAK FACTOR), IMPEDANCE OF SERIES AND PARALLEL CIRCUIT, PHASOR REPRESENTATION, REAL POWER, REACTIVE POWER, APPARENT POWER, POWER FACTOR, POWER TRIANGLE. ANALYSIS OF SINGLE-PHASE AC CIRCUITS CONSISTING OF R,
L, C, RL, RC, RLC COMBINATIONS (SERIES AND PARALLEL), RESONANCE. THREE-PHASE BALANCED CIRCUITS, VOLTAGE AND CURRENT RELATIONS IN STAR AND DELTA CONNECTIONS.

MODULE 3: MAGNETIC CIRCUITS: (4 LECTURES)

INTRODUCTION, SERIES AND PARALLEL MAGNETIC CIRCUITS, ANALYSIS OF SERIES AND PARALLEL MAGNETIC CIRCUITS.

MODULE 4: TRANSFORMERS (6 LECTURES)

MAGNETIC MATERIALS, BH CHARACTERISTICS, IDEAL AND PRACTICAL

TRANSFORMER, EMF EQUATION, EQUIVALENT CIRCUIT, LOSSES IN TRANSFORMERS, REGULATION AND EFFICIENCY. AUTO-TRANSFORMER AND THREE-PHASE TRANSFORMER CONNECTIONS.

MODULE 5: ELECTRICAL MACHINES (10 LECTURES)

CONSTRUCTION, WORKING, TORQUE-SPEED CHARACTERISTIC AND SPEED CONTROL OF SEPARATELY EXCITED DC MOTOR. GENERATION OF ROTATING MAGNETIC FIELDS, CONSTRUCTION AND WORKING OF A THREE-PHASE INDUCTION MOTOR, SIGNIFICANCE OF TORQUE-SLIP CHARACTERISTIC. LOSS COMPONENTS AND EFFICIENCY, STARTING AND SPEED CONTROL OF INDUCTION MOTOR. CONSTRUCTION AND WORKING OF SYNCHRONOUS GENERATORS.

MODULE 6: ELECTRICAL INSTALLATIONS (6 LECTURES)

COMPONENTS OF LT SWITCHGEAR: SWITCH FUSE UNIT (SFU), MCB, ELCB, MCCB, TYPES OF WIRES AND CABLES, EARTHING. TYPES OF BATTERIES, IMPORTANT CHARACTERISTICS FOR BATTERIES. ELEMENTARY CALCULATIONS FOR ENERGY CONSUMPTION, POWER FACTOR IMPROVEMENT AND BATTERY BACKUP.

SUGGESTED TEXT / REFERENCE BOOKS

- *D. P. KOTHARI AND I. J. NAGRATH, "BASIC ELECTRICAL ENGINEERING", TATA MCGRAW HILL, 2010.*
- *D. C. KULSHRESHTHA, "BASIC ELECTRICAL ENGINEERING", MCGRAW HILL, 2009.*
- *L. S. BOBROW, "FUNDAMENTALS OF ELECTRICAL ENGINEERING", OXFORD UNIVERSITY PRESS, 2011.*
- *E. HUGHES, "ELECTRICAL AND ELECTRONICS TECHNOLOGY", PEARSON, 2010.*
- *V. D. TORO, "ELECTRICAL ENGINEERING FUNDAMENTALS", PRENTICE HALL INDIA, 1989.*
- *BASIC ELECTRICAL ENGINEERING BY FITZERALD, ET AL, TATA MCGRAW HILL*
- *FUNDAMENTALS OF ELECTRICAL ENGG. BY R. PRASAD, PHI PUBLICATION*
- *BASIC ELECTRICAL ENGINEERING BY V.K. MEHTA AND ROHIT MEHTA, S.CHAND PUBLICATION*

COURSE OUTCOMES

- ❖ TO UNDERSTAND AND ANALYZE BASIC ELECTRIC AND MAGNETIC CIRCUITS
- ❖ TO STUDY THE WORKING PRINCIPLES OF ELECTRICAL MACHINES AND POWER CONVERTERS.
- ❖ TO INTRODUCE THE COMPONENTS OF LOW VOLTAGE ELECTRICAL INSTALLATIONS

LABORATORY

LIST OF EXPERIMENTS/DEMONSTRATIONS

- ❖ BASIC SAFETY PRECAUTIONS. INTRODUCTION AND USE OF MEASURING INSTRUMENTS – VOLTMETER, AMMETER, MULTI-METER, OSCILLOSCOPE. REAL-LIFE RESISTORS, CAPACITORS AND INDUCTORS.
- ❖ MEASURING THE STEADY-STATE AND TRANSIENT TIME-RESPONSE OF R-L, R-C, AND R-L-C CIRCUITS TO A STEP CHANGE IN VOLTAGE (TRANSIENT MAY BE OBSERVED ON A STORAGE OSCILLOSCOPE). SINUSOIDAL STEADY STATE RESPONSE OF R-L, AND R- C CIRCUITS –

IMPEDANCE CALCULATION AND VERIFICATION. OBSERVATION OF PHASE DIFFERENCES BETWEEN CURRENT AND VOLTAGE. RESONANCE IN R-L-C CIRCUITS.

- ❖ TRANSFORMERS: OBSERVATION OF THE NO-LOAD CURRENT WAVEFORM ON AN OSCILLOSCOPE (NON- SINUSOIDAL WAVE-SHAPE DUE TO B-H CURVE NONLINEARITY SHOULD BE SHOWN ALONG WITH A DISCUSSION ABOUT HARMONICS). LOADING OF A TRANSFORMER: MEASUREMENT OF PRIMARY AND SECONDARY VOLTAGES AND CURRENTS, AND POWER.

- ❖ THREE-PHASE TRANSFORMERS: STAR AND DELTA CONNECTIONS. VOLTAGE AND CURRENT RELATIONSHIPS (LINE-LINE VOLTAGE, PHASE-TO-NEUTRAL VOLTAGE, LINE AND PHASE CURRENTS). PHASE-SHIFTS BETWEEN THE PRIMARY AND SECONDARY SIDE. CUMULATIVE THREE-PHASE POWER IN BALANCED THREE-PHASE CIRCUITS.

- ❖ DEMONSTRATION OF CUT-OUT SECTIONS OF MACHINES: DC MACHINE (COMMUTATOR- BRUSH ARRANGEMENT), INDUCTION MACHINE (SQUIRREL CAGE ROTOR), SYNCHRONOUS MACHINE (FIELD WINGING - SLIP RING ARRANGEMENT) AND SINGLE-PHASE INDUCTION MACHINE.

- ❖ TORQUE SPEED CHARACTERISTIC OF SEPARATELY EXCITED DC MOTOR.

- ❖ SYNCHRONOUS SPEED OF TWO AND FOUR-POLE, THREE-PHASE INDUCTION MOTORS. DIRECTION REVERSAL BY CHANGE OF PHASE-SEQUENCE OF CONNECTIONS. TORQUE- SLIP CHARACTERISTIC OF AN INDUCTION MOTOR. GENERATOR OPERATION OF AN INDUCTION MACHINE DRIVEN AT SUPER- SYNCHRONOUS SPEED.

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ESC	Engineering Graphics & Design	L:1	T:0	P:4	Credit:3

TRADITIONAL ENGINEERING GRAPHICS:

PRINCIPLES OF ENGINEERING GRAPHICS; ORTHOGRAPHIC PROJECTION; DESCRIPTIVE GEOMETRY; DRAWING PRINCIPLES; ISOMETRIC PROJECTION; SURFACE DEVELOPMENT; PERSPECTIVE; READING A DRAWING; SECTIONAL VIEWS; DIMENSIONING & TOLERANCES; TRUE LENGTH, ANGLE; INTERSECTION, SHORTEST DISTANCE.

COMPUTER GRAPHICS:

ENGINEERING GRAPHICS SOFTWARE; -SPATIAL TRANSFORMATIONS; ORTHOGRAPHIC PROJECTIONS; MODEL VIEWING; CO-ORDINATE SYSTEMS; MULTI-VIEW PROJECTION; EXPLODED ASSEMBLY; MODEL VIEWING; ANIMATION; SPATIAL MANIPULATION; SURFACE MODELLING; SOLID MODELLING, INTRODUCTION TO BUILDING INFORMATION MODELLING (BIM).

(EXCEPT THE BASIC ESSENTIAL CONCEPTS, MOST OF THE TEACHING PART CAN HAPPEN CONCURRENTLY IN THE LABORATORY)

MODULE 1: INTRODUCTION TO ENGINEERING DRAWING

PRINCIPLES OF ENGINEERING GRAPHICS AND THEIR SIGNIFICANCE, USAGE OF DRAWING INSTRUMENTS, LETTERING, CONIC SECTIONS INCLUDING THE RECTANGULAR HYPERBOLA (GENERAL METHOD ONLY); CYCLOID, EPICYCLOID, HYPOCYCLOID AND INVOLUTE; SCALES – PLAIN, DIAGONAL AND VERNIER SCALES

MODULE 2: ORTHOGRAPHIC PROJECTIONS

PRINCIPLES OF ORTHOGRAPHIC PROJECTIONS-CONVENTIONS -PROJECTIONS OF

POINTS AND LINES INCLINED TO BOTH PLANES; PROJECTIONS OF PLANES INCLINED PLANES - AUXILIARY PLANES

MODULE 3: PROJECTIONS OF REGULAR SOLIDS

THOSE INCLINED TO BOTH THE PLANES- AUXILIARY VIEWS; DRAW SIMPLE ANNOTATION, DIMENSIONING AND SCALE. FLOOR PLANS THAT INCLUDE: WINDOWS, DOORS, AND FIXTURES SUCH AS WC, BATH, SINK, SHOWER, ETC.

MODULE 4: SECTIONS AND SECTIONAL VIEWS OF RIGHT ANGULAR SOLIDS

COVERING, PRISM, CYLINDER, PYRAMID, CONE – AUXILIARY VIEWS; DEVELOPMENT OF SURFACES OF RIGHT REGULAR SOLIDS- PRISM, PYRAMID, CYLINDER AND CONE; DRAW THE SECTIONAL ORTHOGRAPHIC VIEWS OF GEOMETRICAL SOLIDS, OBJECTS FROM INDUSTRY AND DWELLINGS (FOUNDATION TO SLAB ONLY)

MODULE 5: ISOMETRIC PROJECTIONS

PRINCIPLES OF ISOMETRIC PROJECTION – ISOMETRIC SCALE, ISOMETRIC VIEWS, CONVENTIONS; ISOMETRIC VIEWS OF LINES, PLANES, SIMPLE AND COMPOUND SOLIDS; CONVERSION OF ISOMETRIC VIEWS TO ORTHOGRAPHIC VIEWS AND VICE-VERSA, CONVENTIONS

MODULE 6: OVERVIEW OF COMPUTER GRAPHICS

LISTING THE COMPUTER TECHNOLOGIES THAT IMPACT ON GRAPHICAL COMMUNICATION, DEMONSTRATING KNOWLEDGE OF THE THEORY OF CAD SOFTWARE [SUCH AS: THE MENU SYSTEM, TOOLBARS (STANDARD, OBJECT PROPERTIES, DRAW, MODIFY AND DIMENSION), DRAWING AREA (BACKGROUND, CROSSHAIRS, COORDINATE SYSTEM), DIALOG BOXES AND WINDOWS, SHORTCUT MENUS (BUTTON BARS), THE COMMAND LINE (WHERE APPLICABLE), THE STATUS BAR, DIFFERENT METHODS OF ZOOM AS USED IN CAD, SELECT AND ERASE OBJECTS.; ISOMETRIC VIEWS OF LINES, PLANES, SIMPLE AND COMPOUND SOLIDS]

MODULE 7: CUSTOMISATION& CAD DRAWING

CONSISTING OF SET UP OF THE DRAWING PAGE AND THE PRINTER, INCLUDING SCALE SETTINGS, SETTING UP OF UNITS AND DRAWING LIMITS; ISO AND ANSI STANDARDS FOR COORDINATE DIMENSIONING AND TOLERANCING; ORTHOGRAPHIC CONSTRAINTS, SNAP TO OBJECTS MANUALLY AND AUTOMATICALLY; PRODUCING DRAWINGS BY USING VARIOUS COORDINATE INPUT ENTRY METHODS TO DRAW STRAIGHT LINES, APPLYING VARIOUS WAYS OF DRAWING CIRCLES.

MODULE 8: ANNOTATIONS, LAYERING & OTHER FUNCTIONS

COVERING APPLYING DIMENSIONS TO OBJECTS, APPLYING ANNOTATIONS TO DRAWINGS; SETTING UP AND USE OF LAYERS, LAYERS TO CREATE DRAWINGS, CREATE, EDIT AND USE CUSTOMIZED LAYERS; CHANGING LINE LENGTHS THROUGH MODIFYING EXISTING LINES (EXTEND/LENGTHEN); PRINTING DOCUMENTS TO PAPER USING THE PRINT COMMAND; ORTHOGRAPHIC PROJECTION TECHNIQUES; DRAWING SECTIONAL VIEWS OF COMPOSITE RIGHT REGULAR GEOMETRIC SOLIDS AND PROJECT THE TRUE SHAPE OF THE SECTIONED SURFACE; DRAWING ANNOTATION, COMPUTER-AIDED DESIGN (CAD) SOFTWARE MODELING OF PARTS AND ASSEMBLIES. PARAMETRIC AND NON-PARAMETRIC SOLID, SURFACE, AND WIREFRAME MODELS. PART EDITING AND TWODIMENSIONAL DOCUMENTATION OF MODELS. PLANAR PROJECTION THEORY, INCLUDING SKETCHING OF PERSPECTIVE, ISOMETRIC, MULTIVIEW, AUXILIARY, AND SECTION VIEWS. SPATIAL VISUALIZATION EXERCISES. DIMENSIONING GUIDELINES, TOLERANCING TECHNIQUES; DIMENSIONING AND SCALE MULTI VIEWS OF DWELLING.

MODULE 9: DEMONSTRATION OF A SIMPLE TEAM DESIGN PROJECT THAT ILLUSTRATES

GEOMETRY AND TOPOLOGY OF ENGINEERED COMPONENTS: CREATION OF ENGINEERING MODELS AND THEIR PRESENTATION IN STANDARD 2D BLUEPRINT FORM AND AS 3D WIRE- FRAME AND SHADED SOLIDS; MESHED TOPOLOGIES FOR ENGINEERING ANALYSIS AND TOOL- PATH GENERATION FOR COMPONENT MANUFACTURE; GEOMETRIC DIMENSIONING AND TOLERANCING; USE OF SOLIDMODELING SOFTWARE FOR CREATING ASSOCIATIVE MODELS AT THE COMPONENT AND ASSEMBLY LEVELS. FLOOR PLANS THAT INCLUDE: WINDOWS, DOORS, AND FIXTURES SUCH AS WC, BATH, SINK, SHOWER, ETC. APPLYING COLOUR CODING ACCORDING TO BUILDING DRAWING PRACTICE; DRAWING SECTIONAL ELEVATION SHOWING FOUNDATION TO CEILING; INTRODUCTION TO BUILDING INFORMATION MODELLING (BIM).

SUGGESTED TEXT/REFERENCE BOOKS:

- *BHATT N.D., PANCHAL V.M. & INGLE P.R., (2014), ENGINEERING DRAWING, CHAROTAR PUBLISHING HOUSE*
- *SHAH, M.B. &RANA B.C. (2008), ENGINEERING DRAWING AND COMPUTER GRAPHICS, PEARSON EDUCATION*
- *AGRAWAL B. & AGRAWAL C. M. (2012), ENGINEERING GRAPHICS, TMH PUBLICATION*
- *NARAYANA, K.L. & P KANNAIAH (2008), TEXT BOOK ON ENGINEERING DRAWING, SCITECHPUBLISHERS*
- *(CORRESPONDING SET OF) CAD SOFTWARE THEORY AND USER MANUALS*

COURSE OUTCOMES

ALL PHASES OF MANUFACTURING OR CONSTRUCTION REQUIRE THE CONVERSION OF NEW IDEAS AND DESIGN CONCEPTS INTO THE BASIC LINE LANGUAGE OF GRAPHICS. THEREFORE, THERE ARE MANY AREAS (CIVIL, MECHANICAL, ELECTRICAL, ARCHITECTURAL AND INDUSTRIAL) IN WHICH THE SKILLS OF THE CAD TECHNICIANS PLAY MAJOR ROLES IN THE DESIGN AND DEVELOPMENT OF NEW PRODUCTS OR
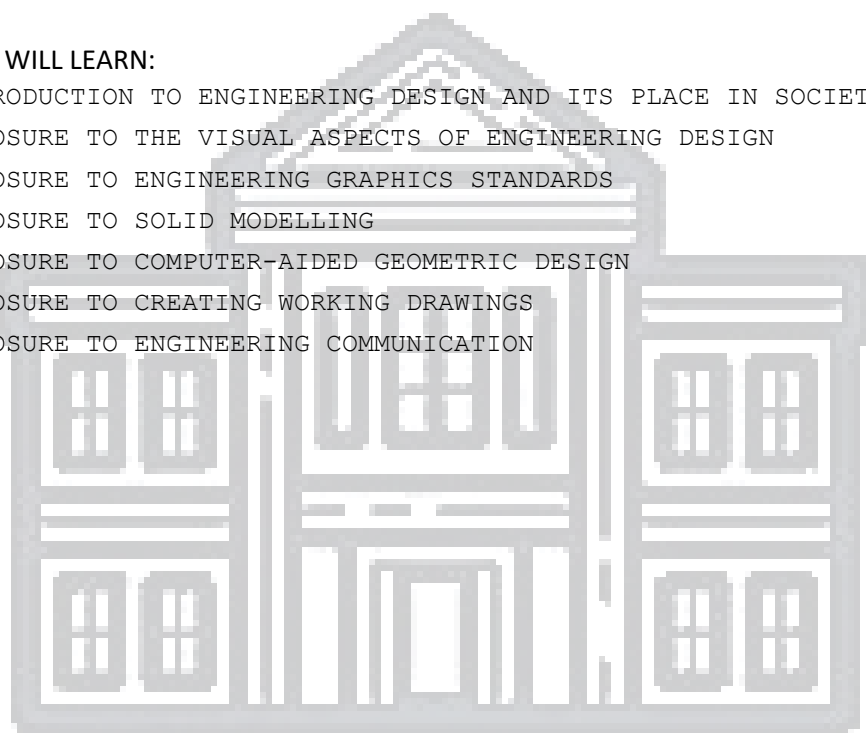
CONSTRUCTION. STUDENTS PREPARE FOR ACTUAL WORK SITUATIONS THROUGH PRACTICAL TRAINING IN A NEW STATE-OF-THE-ART COMPUTER DESIGNED CAD LABORATORY USING ENGINEERING SOFTWARE

THIS COURSE IS DESIGNED TO ADDRESS:

- ❖ TO PREPARE YOU TO DESIGN A SYSTEM, COMPONENT, OR PROCESS TO MEET DESIRED NEEDS WITHIN REALISTIC CONSTRAINTS SUCH AS ECONOMIC, ENVIRONMENTAL, SOCIAL, POLITICAL, ETHICAL, HEALTH AND SAFETY, MANUFACTURABILITY, AND SUSTAINABILITY
- ❖ TO PREPARE YOU TO COMMUNICATE EFFECTIVELY
- ❖ TO PREPARE YOU TO USE THE TECHNIQUES, SKILLS, AND MODERN ENGINEERING TOOLS NECESSARY FOR ENGINEERING PRACTICE

THE STUDENT WILL LEARN:

- ❖ INTRODUCTION TO ENGINEERING DESIGN AND ITS PLACE IN SOCIETY
- ❖ EXPOSURE TO THE VISUAL ASPECTS OF ENGINEERING DESIGN
- ❖ EXPOSURE TO ENGINEERING GRAPHICS STANDARDS
- ❖ EXPOSURE TO SOLID MODELLING
- ❖ EXPOSURE TO COMPUTER-AIDED GEOMETRIC DESIGN
- ❖ EXPOSURE TO CREATING WORKING DRAWINGS
- ❖ EXPOSURE TO ENGINEERING COMMUNICATION