Syllabus for Under Graduate (B. Tech) Programs: Common Courses (1st and 2nd Semester)

CENTRAL INSTITUTE OF TECHNOLOGY KOKRAJHAR

केन्द्रीय प्रौद्योगिकी संस्थान कोकराझार

(Deemed to be University)

Centrally Funded Institute under MHRD, Govt. of India

Kokrajhar, BTAD, Assam 783370

Course Structures: Semester I

Theory

Sl. No.	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	UPH101	Engineering Physics	3	1	0	8
2	UMA101	Engineering Mathematics-I	3	1	0	8
3	UEE101	Basic Electrical Engineering	3	1	0	8
4	UHSS 101	English Communication	2	0	0	4
5	UME101	Engineering Workshop	1	0	0	2
Total			**12**	**3**	**0**	**30**

Practical

Sl. No.	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	UPH171	Engineering Physics Lab	0	0	3	3
2	UEE171	Basic Electrical Engineering Lab	0	0	2	2
3	UHSS171	English Communication Practice	0	0	2	2
4	UME171	Workshop Practice	0	0	4	4
Total			**0**	**0**	**11**	**11**

Total weekly contact hours: 26
Total credits: 41

Course Structures: Semester II

Theory

Sl. No.	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	UCH201	Engineering Chemistry	3	1	0	8
2	UMA201	Engineering Mathematics-II	3	1	0	8
3	UCSE201	Programing for Problem Solving	4	1	0	10
4	UCE201	Engineering Drawing and Computer Graphics	1	0	0	2
5	UHSS201	Professional Ethics and Human Value	2	0	0	4
Total			**13**	**3**	**0**	**32**

Practical

Sl. No.	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	UCH271	Engineering Chemistry Lab	0	0	2	2
2	UCSE271	Programing for Problem Solving Lab	0	0	4	4
3	UCE271	Engineering Drawing and Computer Graphics Lab	0	0	4	4
Total			**0**	**0**	**10**	**10**

Total weekly contact hours: 26
Total credits: 42

Course title: Physics (Theory)

Course code: UPH101

Lecture (L)	Tutorial (T)	Practical (P)
3	1	3

1. Mathematical Physics:

Vector and Scalar field, grad, divergence, curl, Laplacian, line integral, surface integral, volume integral, physical examples in the context of electricity and magnetism, Stokes theorem, Gauss theorem (No proof). [5L]

2. Electrodynamics:

Gauss Law of electrostatics, Biot-Savart Law, Ampere's Law, Displacement current, Equation of Continuity, Maxwell's equations in differential and integral form, Maxwell's wave equation in free space, propagation of EM wave in free space, transverse nature of EM wave. [6L]

3. Heat and thermodynamics:

Thermodynamic system and state variables, Heat &Work, Zeroth Law, 1^{st} and 2^{nd} laws of thermodynamics, Isothermal and adiabatic changes, Carnot theorem, Carnot engine, entropy, pyrometer. [5L]

4. Wave and Oscillations:

- Transverse wave on a string, reflection and transmission of waves at boundary, impedance matching, standing waves and their Eigen frequencies, acoustics waves and speed of sound.
- Simple harmonic motion**,** Damped oscillation-its differential equation, energy decay in a damped oscillation, Forced vibration, Resonance, Sharpness of resonance and quality factor. [8L]

5. Introduction to Quantum Mechanics:

Wave-Particle duality, Black body radiation, Photoelectric effect, Compton effect, Uncertainty principle, wave function, the Schrodinger time dependent and time independent equations, application of Schrodinger equation for free particle in one dimensional infinite potential box.

[6L]

6. Optics and Optoelectronics:

- Huygens' Principle, superposition of waves and interference of light, Young's double slit experiment, Newton's rings, Diffraction, Single slit diffraction, grating.

- LASER: Einstein's theory of matter radiation interaction and A and B coefficients, amplification of light by population inversion, properties of laser: monochromaticity, coherence, directionality and brightness, different types of laser: gas lasers (He-Ne) and solid state laser (Ruby), applications of laser in science, engineering and medicine.
- Light emitting diodes (LED): device structure, materials, characteristics and figures of merit.

[10L]

List of Recommended Text and Reference Books:

1. *Engineering Physics, Malik and Singh, Tata Mc Graw Hill*
2. *Engineering Physics, Naidu, Pearson*
3. *Engineering Physics, Gupta & Gaur, Dhanpat Rai*
4. *Quantum Mechanics, Ajay Ghatak S. Lokanathan, Trinity*
5. *Quantum Mechanics: A Text Book for undergraduates, Mahesh C Jain, TMH*
6. *Thermodynamics and kinetic theory of gases*, W. Pauli, Dover Publications, 2010
7. *Electromagnetic Theory, Prabir K. Basu & Hrishikesh Dhasmana, AneBooks*
8. *Introduction to Electrodynamics, David Griffiths*
9. *Electricity, magnetism and light, W. Saslow*
10. *Oscillations and waves in physics, Ian G. Main,*
11. *The physics of vibrations and waves, H.J. Pain,*
12. *Arthur Beiser, Concepts of Modern Physics (Sixth Edition), Tata McGraw-Hill Publication, New Delhi (1988).*

Course title: Engineering Physics Lab
Course code: UPH171
L-T-P: 0-0-3

List of experiments:

Experiment No 1: To determine the magnetic moment of a bar magnet and the horizontal component of the earth's magnetic field.

Experiment No 2: To study the Hall Effect in semiconductor (Germanium Crystal) and then to calculate the Hall coefficient.

Experiment No 3: To Verify Stefan-Boltzmann law of thermal radiation by electrical method.

Experiment No 4: To determine the coefficient of thermal conductivity of a bad conductor (glass) by using Lee's Disc apparatus.

Experiment No 5: To study the variation of time period of a bar pendulum about different axes and determine the value of acceleration due to gravity (g) at the place.

Experiment No 6: To determine the wavelength of sodium light by measuring the diameters of Newton's Rings.

Experiment No 7: To determine the wavelength of Laser light by using diffraction grating.

Experiment No 8: To determine the grating element by using sodium vapour lamp.

Experiment No 9: To determine the value of Planck's constant with the help of vacuum phototube.

Experiment No 10: To study the current flowing through an external circuit by a potentiometer and determine the internal resistance of a standard cell.

Course Title: Engineering Mathematics-I

Course Code:- UMA101 **Credit: 04: [L-T-P: 3-1-0]**

Unit 1: Calculus-I (10 hours)

Rolle's Theorem, Mean value theorems, Taylor's and McLaurin theorems with remainders, indeterminate forms and L'Hospital's rule, Beta and Gamma functions and their properties, Applications of definite integrals.

Unit 2: Calculus-II (10 hours)

Successive derivative, Libnitz's Theorem, Tangent and Normal, Derivation of arc length (Cartesian and Polar coordinates), curvature, partial derivatives, Homogeneous functions.

Unit 3: Sequences and series (10 hours)

Convergence of sequence and series, tests for convergence (Comparison test, Ratio test, Cauchy Root test) Power series, Taylor's series, Fourier series: Half range sine and cosine series.

Unit 4: Multivariable Calculus (10 hours)

Differentiation of vector functions, scalar and vector filed, gradient of a scalar function, directional derivatives, Gradient, curl and divergence and their properties, Integration of vector functions, Line, surface and volume integral, Green's theorem, Gauss's and Stoke's Theorem.

Textbooks/References:

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
3. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11thReprint, 2010.
5. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
6. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
7. B.S. Grewal, Higher Engineering Mathematics

Course title: BASIC ELECTRICAL ENGINEERING

Course code: UEE101 **Credit: L-T-P: 3-1-0**

Introduction: Sources of energy; General structure of electrical power systems, Power transmission and distribution via overhead lines and underground cables.

DC circuits: Definitions of active, passive, linear, non-linear circuits elements and networks, Kirchoff's laws, Nodal and mesh analysis, voltage and current sources, network theorems – superposition. Thevenin's, Norton's, maximum power transfer, millman's, and reciprocity theorems, analysis of simple circuits with DC excitation.

Single phase AC circuits: generation of single phase sinusoidal EMF, instantaneous, average and effective value, form and peak factor, examples of other alternating waveforms and average and effective value calculations, concept of phasor and phasor diagrams, lagging and leading of phasors, AC circuits --- pure resistive, inductive and capacitive circuits, power factor, complex power, R-L, R-C and R-L-C series circuits, parallel AC circuits, series and parallel resonance.

Three phase AC circuits: Generation of three phase EMF, delta and star connections, line and phase value of emf and current, solutions of simple 3-phase balance circuits with resistive and inductive loads, 3-phase power, comparison between 3-phase and 1-phase systems, applications of 3-phase systems.

Magnetic circuits: Ampere's circuital law, B-H curve, definition of mmf, flux, flux-density and reluctance, comparison between electric and magnetic circuits, series, parallel and series-parallel circuits and their solutions, energy stored in magnetic circuit, lifting magnets, electromagnetic induction, self and mutual inductance, hysteresis and eddy current losses.

Electrical machines: Introduction of electrical machines, classifications (DC and AC machines), transformers, technical specifications, reading of nameplate data, general applications (especially 1-phase and 3-phae induction motors).

Electrical measuring instruments: Classification of instruments, essentials of indicating type instruments – deflecting torque, controlling torque, damping, types of indicating instruments, MC and MI type ammeters and voltmeters, extension of range, use of shunts and multiplier, errors and compensation.

Electrical installations: Electrical wiring and type, fuse and its ratings, types of wires and cables, LT switch gears: MCB, ELCB, MCCB etc. Earthing and its importance. Electrochemical power sources: primary and secondary cells, classifications of secondary cells based on applications, Lead-acid cell, electrical characteristics of lead-acid cell, maintenance, charging methods of batteries.

Suggested Text / Reference Books:

(i) D.P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
(ii) D.C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
(iii) B.L. Thereja, A.K. Thereja, " A Textbook of Electrical Technology", S.Chand

Course: Basic Electrical Engineering Lab

Code: UEE171 **L-T-P: 0-0-3**

List of experiments

1. Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, rheostat and wattmeter.
2. Make a measured resistance from a given rheostat
3. Verification of Kirchhoff's laws
4. Verification of Superposition theorem
5. Verification of Thevenin's theorem
6. Verification of Maximum Power Transfer theorem
7. Measurement of voltage, current, power and power factor in single phase AC circuits.
8. Measurement of lamp's filament resistance.
9. Wiring

Course Title: English Communication Skills
Course Code: UHSS101, UHSS171
Credit: L-T-P: 2-0-2

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1. **Vocabulary Building:**
   1.1 Word Formation
   1.2 Root words from foreign languages and their use in English
   1.3 Understanding prefixes and suffixes to form derivatives
   1.4 Antonyms and Synonyms, Functional Vocabulary, Idioms and Phrasal Verbs

2. **Basic Writing Skills**
   2.1 Sentence Structure
   2.2 use of phrases and clauses in sentences
   2.3 Importance of proper punctuation
   2.4 Creating Coherence
   2.5 Organizing Principles of paragraph in documents
   2.6 techniques of writing precisely

3. **Identifying Common Errors in Writing**
   3.1 Subject-verb Agreement
   3.2 Noun-pronoun agreement
   3.3 Effective Principles of Sentence Structure
   3.4 Misplaced Modifiers
   3.5 Articles
   3.6 Prepositions
   3.7 Redundancies
   3.8 Cliches

4. **Nature and Style of Sensible Writing**
   4.1 Describing
   4.2 Defining
   4.3 Classifying
   4.4 Providing examples or evidence
   4.5 Writing Introduction and Conclusion

5. **Business Writing Practices**
   5.1 Letter Writing, Memo, Report
   5.2 Email
   5.3 CV, Resume

6. **Oral Communication:** (The Unit involves interactive practice sessions in language Lab)
   6.1. IPA Symbols, pronunciation, Intonation, Stress and Rhythm
   6.2. Listening Comprehension
   6.3. Common Everyday Situations: Conversation and dialogues
   6.4. Communication at work place
   6.5. Interviews
   6.6. Formal Presentations

7. **Learning Language through Literature**
   7.1. Novel: R.K. Narayan *The Guide*
   7.2. Poem: John Keats *Ode to a Nightingale* and *Ode to a Gracian Urn*

Suggested Readings:

(i) Practical English Usage, Michael Swan, OUP,1995
(ii) Remedial English Grammar, F.T. Wood, Macmillan, 2007
(iii) On Writing Well, William Zinsser, Harper Resource Book, 2001
(iv) Study Writing, Liz Hamp-Lyons and Ben Heasely, CUP, 2006
(v) Communication Skills, Sanjay Kumar and PushpLata, OUP, 2011
(vi) Exercises in Spoken English, Parts-I-III, CIEFL, Hyderabad, OUP

Workshop Practice:

Course Code: UME101 **Lectures: (L:1; T:0; P:0; credit:2)**

1. Manufacturing Methods- casting, forming, machining, joining, advanced manufacturing methods (3 lectures)

2. CNC machining, Additive manufacturing (1 lecture)

3. Fitting operations & power tools (1 lecture)

4. Electrical &Electronics (1 lecture)

5. Carpentry (1 lecture)

6. Metal casting (1 lecture)

7. Welding (arc welding & gas welding), brazing (1 lecture)

Suggested Text/Reference Books:

(i) Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
(ii) Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology", 4th edition, Pearson Education India Edition, 2002.
(iii)Gowri P. Hariharan and A. Suresh Babu,"Manufacturing Technology – I" Pearson Education, 2008.
(iv) Roy A. Lindberg, "Processes and Materials of Manufacture", 4th edition, Prentice Hall India, 1998.
(v) Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGrawHill House, 2017.

Course Outcomes:

Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.

Basic Workshop Practice: (L:0; T:0; P:4; credit:4)

1st and 2nd semester for all branches

Course Content

1. Carpentry shop (12 hrs) (Theory and Practice)
    - 1.1 Introduction with the shop
    - 1.2 Various structure of wood and types of wood
    - 1.3 Different types of tools, machine and accessories used in Carpentry shop
    - 1.4 Safety Precautions in workshop

    Details of Practical Contents (3+3 hrs)
    - Demo of different wood working tools and machines
    - Demo of different wood working processes
    - Simple joints like T joints etc.
    - One simple utility job.

2. Fitting Shop (12hrs) (Theory and Practice)
    - 2.1 Introduction with the fitting shop
    - 2.2 Various marking, measuring, cutting, holding and striking tools
    - 2.3 Different Operations like chipping, filing, marking drilling etc.
    - 2.4 Working principle of drilling machine, lapping dies etc.

    Details of Practical Contents (3+3 hrs)
    - Demo of different fitting tools and machines and power tools
    - Demo of different processes in fitting shop
    - Squaring of a rectangular metal piece
    - One simple utility job.

3. Welding Shop (12hrs) (Theory and Practice)
    - 3.1 Introduction
    - 3.2 Types of Welding, Arc Welding, Gas Welding, Gas Cutting
    - 3.3 Welding of dissimilar materials, selection of welding rod material, size of rod and work piece
    - 3.4 Different types of flames
    - 3.5 Elementary symbolic Representation
    - 3.6 Safety and precautions

    Details of Practical Contents (3+3 hrs)
    - Demo of different welding tools and machines
    - Demo of Arc Welding, Gas Welding, Gas Cutter and rebuilding of broken parts with welding
    - Any one Composite job involving lap joint welding process.

4. Machine Shop (12hrs) (Theory and Practice)
    - 4.1 Introduction
    - 4.2 Study of Different types of Lathe machine, shaping machine, Drilling machine
    - 4.3 Study of Different types of hand tools and machine tools and parts
    - 4.4 Safety & precautions

    Details of Practical Contents (3+3 hrs)
    - Demo of different machines and their operations
    - Preferably prepare a simple job

5. Plumbing Shop (12hrs) (Theory and Practice)

5.1 Introduction
5.2 Various marking, measuring, cutting, holding and striking tools
5.3 Different G.I. Pipes, PVC pipes, flexible pipes used in practice
5.4 GI pipes, PVC pipes fittings and accessories adhesive solvents, pipe layout
Demo of Different Plumbing tools
Demo of Different operations
Cutting thread, using socket, elbow and tee etc.
Prepare a nipple of 6 inch or a 12 inch
Advised to prepare utility job

Examinations could involve the actual fabrication of simple components, utilizing one or more of the techniques covered above.

Laboratory Outcomes:

- Upon completion of this laboratory course, students will be able to fabricate components with their own hands.
- They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.
- By assembling different components, they will be able to produce small devices of their interest.

Detailed Syllabus: Semester II

Course Title: Engineering Chemistry
Course Code: UCH201 **Credit: 10 [L-T-P: 3-1-2]**

UNIT:1 Molecular Structure and Quantum Mechanics: Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures. Molecular orbital and quantum mechanics: Schrodinger equation, Eigen function, orthogonal and orthonormal. (6L)

UNIT:2 Electrochemistry: Electrochemical Cells – EMF of a cell, Electrodes, reference electrodes, application of Nernst equation and related problems. Principle of fuel cell, lead acid battery. Corrosion and material oxidation (4L)

UNIT:3 Reaction dynamics and Thermodynamics: Reaction laws: rate and order; molecularity; first and second order kinetics; (Arrhenious equation) catalysis. Laws and applications of thermodynamics, 1^{st} law and 2^{nd} law, Carnot cycle and related problems. (8L)

UNIT:4 Instrumental Methods of Analysis: Introduction to sophisticated instrumental techniques for characterization of compounds, materials, metals such as Powder X-ray diffraction, surface area, IR, UV,-Vis, NMR, SEM, TEM and GCMS (3L)

UNIT:5 Structure, Reactivity of Organic Molecules and Synthesis of Drug Molecule: Concept of electron displacement and their applications, types of intermediate organic species, brief study of some addition, elimination and substitution reaction, cyclization and ring openings. Benzyne reaction, Chichibabin reaction, Hoffman Exhaustive reactions, few important name reactions, to reactions involving substitution, addition, elimination, oxidation, reduction, cyclization and ring openings. Synthesis of a commonly used drug molecule. (5L)

UNIT:6 Polymerization: Concepts, classifications and industrial applications; polymerization processes, degree of polymerization (addition and condensation polymerization); preparation, structure and use of some common polymers: plastic (PE, PP, PVC, Bakelite), rubber (natural rubber, SBR, NBR), fibre (nylon 6,6; polyester); conducting and semiconducting polymers. (4L)

UNIT:7 Industrial Chemistry: Solid liquid and gaseous fuels; constituents of coal, carbonization of coal, coal analysis, proximate and ultimate analysis, classification of coal, petroleum, gasoline. Octane number, cetane number, aviation fuel, natural gas, water gas. (4L)

UNIT:8 Materials Engineering: Concept of nano-chemistry, new forms of carbon, S.W.C.N.T., M.W.C.N.T., Liquid crystals. (4L)

UNIT:9 Biochemistry: Carbohydrates, lipids, amino acids, proteins, Nucleic acid – DNA and RNA, Vitamins and hormones – sources and application. (2L)

Course Title: Engineering Chemistry (LAB)
Course Code: UCH271

Experiment-1: Aim of the experiment: *To determine the coefficient of viscosity of the glycerol by using Ostwald's viscometer*.

Experiment-2: Aim of the experiment: *To determine the surface tension of the given liquid with respect to water at room temperature by using Stalagnometer*.

Experiment-3: Aim of the experiment: *To identify acid radicals be dry and wet tests.*

Experiment-4 Aim of the experiment: *To identify basic radicals be dry and wet tests*

Experiment-5 Aim of the experiment: *Preparation of standard solution of* Na_2CO_3

Experiment-6 Aim of the experiment: *Preparation of standard solution of oxalic acid.*

Experiment-7 Aim of the experiment: *Determination of strength of* H_2SO_4 *by titrating with 0.1 N* Na_2CO_3

Experiment-8 Aim of the experiment: *Determination of strength of NaOH by titrating with 0.1 N HCL*

Experiment-9 Aim of the experiment: *Redox Titration* $KMnO_4$ *Vs* $H_2C_2O_4$

Experiment-10 Aim of the experiment: *Introduction to sophisticated instruments like FT-IR, UV-Visible and GC*

Text/Reference Books:

1. S. Chawla, *A Text Book of Engineering Chemistry*, Dhanpat Rai Publishing Co.
2. Jain and Jain, *Engineering Chemistry*, Dhanpat Rai Publishing Co.
3. Atkins, *Physical Chemistry*, Oxford.
4. J. D. Lee, *Concise Inorganic Chemistry*, Blackwell Science.
5. V.R. Gowariker, N.V. Viswanathan, J. Sreedhar, *Polymer Science*, New Age International Publisher.
6. A.K. Chandra, *Introductory Quantum Chemistry*, 4th Edition, McGraw-Hill
7. S.K. Ghosh Advanced General Organic Chemistry (A Modern Approach) (Set I & Ii) NCBA Publisher, New Delhi, 2009
8. B. Viswanathan, P. S. Raghavan, Practical Physical Chemistry, Viva
9. Dr. S. Rattan, Experiments in Applied Chemistry, S. K. Kataria & Sons.

Justification for both theory and practical syllabi:

Now a days, chemicals and chemical products are playing important role in the field of biotechnology, engineering, agriculture and pharmacology etc. and use of chemical materials & its applications are increasing exponentially. Therefore, Engineering Chemistry (Theory and practical) syllabi for degree students are designed for physical, organic and biochemistry related materials to enhance their scientific temper and appreciations, and to help them to correlate between chemistry with other engineering subjects like Foods, Civil, ECE etc.

Course Title: Engineering Mathematics-II

Course Code:- UMA201 **Credit: 04: [L-T-P: 3-1-0]**

Unit –1: Matrices (10 hours): Inverse and rank of a matrix, rank-nullity theorem; System of linear equations; Symmetric, skew symmetric and orthogonal matrices; Determinants; Eigenvalues and eigenvectors; Diagonalization of matrices; Cayley-Hamilton Theorem.

Unit-2: **First order ordinary differential equations:** (10 hours)
Exact, linear and Bernoulli's equations, Euler's equations, Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.

Unit -3: Ordinary differential equations of higher orders: (10 hours)
Second order linear differential equations with constant and variable coefficients, method of variation of parameters, Cauchy-Euler equation; System of linear differential equations.

Unit 4: **Probability and Statistics (10 hours):** Probability distributions: Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions.
Probability spaces, conditional probability, independence; Discrete and continuous random variables and their properties, Independent random variables; Expectation of Discrete and continuous random variables, Moments, mean and variance.

Reference /Text Books

1. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
2. V. Krishnamurthy, V.P. Mainra and J.L. Arora, An introduction to Linear Algebra, Affiliated East–West press, Reprint 2005.
3. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
4. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
5. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2010.
6. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.
7. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
8. W. E. Boyce and R. C. DiPrima, Elementary Differential Equations and Boundary Value Problems, 9th Edition, Wiley India, 2009.
9. S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.
10. E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice Hall India, 1995.
11. E. L. Ince, Ordinary Differential Equations, Dover Publications, 1958.
12. G.F. Simmons and S.G. Krantz, Differential Equations, Tata McGraw Hill, 2007.

Course Title: Programming for Problem Solving

Course Code: UCSE201 **Credit: L : 4; T:1; P : 3**

***Unit 1*: Introduction to Programming**
Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.)
Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/Pseudocode with examples.
From algorithms to programs; source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code

***Unit 2:* Arithmetic expressions and precedence**

***Unit 3*: Conditional Branching and Loops**
Writing and evaluation of conditionals and consequent branching
Iteration and loops

***Unit 4:* Arrays**
Arrays (1-D, 2-D), Character arrays and Strings

***Unit 5:* Basic Algorithms**
Searching, Basic Sorting Algorithms (Bubble, Insertion and Selection), Finding roots of equations, notion of order of complexity through example programs (no formal definition required)

***Unit 6:* Function**
Functions (including using built in libraries), Parameter passing in functions, call by value, Passing arrays to functions: idea of call by reference

***Unit 7:* Recursion**
Recursion, as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, Ackerman function etc. Quick sort or Merge sort.

***Unit 8:* Structure**
Structures, Defining structures and Array of Structures

***Unit 9:* Pointers**
Idea of pointers, Defining pointers, Use of Pointers in self-referential structures, notion of linked list (no implementation)

***Unit 10:* File handling**

Suggested Text Books
(i) Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
(ii) E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill

Suggested Reference Books
(i) Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India

Course Outcomes
The student will learn
 To formulate simple algorithms for arithmetic and logical problems.
 To translate the algorithms to programs (in C language).
 To test and execute the programs and correct syntax and logical errors.

(ii) Laboratory - Programming for Problem Solving, Course Code: UCSE271

[The laboratory should be preceded or followed by a tutorial to explain the approach or algorithm to be implemented for the problem given.]
Tutorial 1: Problem solving using computers:
Lab1: Familiarization with programming environment
Tutorial 2: Variable types and type conversions:
Lab 2: Simple computational problems using arithmetic expressions
Tutorial 3: Branching and logical expressions:
Lab 3: Problems involving if-then-else structures
Tutorial 4: Loops, while and for loops:
Lab 4: Iterative problems e.g., sum of series
Tutorial 5: 1D Arrays: searching, sorting:
Lab 5: 1D Array manipulation
Tutorial 6: 2D arrays and Strings
Lab 6: Matrix problems, String operations
Tutorial 7: Functions, call by value:
Lab 7: Simple functions
Tutorial 8 and 9: Numerical methods (Root finding, numerical differentiation, numerical integration):
Lab 8 and 9: Programming for solving Numerical methods problems
Tutorial 10: Recursion, structure of recursive calls
Lab 10: Recursive functions
Tutorial 11: Pointers, structures and dynamic memory allocation
Lab 11: Pointers and structures
Tutorial 12: File handling:
Lab 12: File operations

Laboratory Outcomes

 To formulate the algorithms for simple problems
 To translate given algorithms to a working and correct program
 To be able to correct syntax errors as reported by the compilers
 To be able to identify and correct logical errors encountered at run time
 To be able to write iterative as well as recursive programs
 To be able to represent data in arrays, strings and structures and manipulate them through a program
 To be able to declare pointers of different types and use them in defining selfreferential structures.
 To be able to create, read and write to and from simple text files.

Course Title: Engineering Drawing and Computer Graphics

Course Code: UCE201 **Credit: L-T-P: 1-0-4**

Unit-I

- Introduction to IS code of drawing.
- Scale and Letter

Unit-II

- Conics and Engineering Curves – ellipse, parabola, hyperbola, cycloid, trochoid, involute.
- Projection of lines – traces, true length.

Unit-III

- Projection of planes and solids; sold objects – cube, prism, pyramid, cylinder, cone and sphere.

Unit-IV

- Projection on Auxiliary planes; Isometric projection, isometric scale.
- Section of solids – true shape of section.

Unit-V

- Introduction to CAD tools – basics; Introduction of Development and Intersection of surfaces.

Reference Books:

1. Engineering Drawing by N D Bhatt.
2. 2Engineering Drawing and Graphics by K Venugopal.

Course Title: PROFESSIONAL ETHICS ANDHUMAN VALUE
Course Code: UHSS201
Credit : L-T-P: 2-0-0

MODULE	TOPIC	COURSE CONTENT
1	**Engineering Ethics**	Senses of 'engineering ethics' – variety of moral issues – types of inquiry – moral dilemmas – moral autonomy – Kohlberg's theory – Gilligan's theory – consensus and controversy – professions and professionalism – professional ideals and virtues – theories about right action – self-interest – customs and religion – uses of ethical theories
2	**Engineering as Social Experimentation**	Engineering as experimentation – engineers as responsible experimenters – codes of ethics – a balanced outlook on law – the challenger case study
3	**Responsibility for Safety**	Safety and risk – assessment of safety and risk – risk benefit analysis – reducing risk.
4	**Responsibilities and Rights**	Collegiality and loyalty – respect for authority – collective bargaining – confidentiality – conflicts of interest – occupational crime – professional rights – employee rights – intellectual property rights – discrimination
5	**Global Issues**	Multinational corporations – environmental ethics – computer ethics – Sustainable development – engineers as managers – consulting engineers – engineers as expert witnesses and advisors – moral leadership – sample code of conduct

TEXTBOOKS/REFERENCES:

1. Mike Martin and Roland Schinzinger, "*Ethics in Engineering*", McGraw Hill, New York, 1996.
2. Charles D Fleddermann, "*Engineering Ethics*", prentice Hall, New Mexico, 1999.
3. LauraSchlesinger, "*How Could You Do That: The Abdication of Character, Courage, and Conscience*", Harper Collins, New York, 1996.
4. Stephen Carter, "*Integrity*", Basic Books, New York, 1996.

Syllabus for Under Graduate (B. Design) Programs: Common Courses (1st and 2nd Semester)

CENTRAL INSTITUTE OF TECHNOLOGY KOKRAJHAR

केन्द्रीय प्रौद्योगिकी संस्थान कोकराझार

(Deemed to be University)

Centrally Funded Institute under MHRD, Govt. of India

Kokrajhar, BTAD, Assam 783370

COURSE LAYOUT OF BACHELOR OF DESIGN (MULTIMEDIA COMMUNICATION AND DESIGN)

SEMESTER I

SL. NO.	COURSE CODE	COURSE TITLE	L	T	P/S*	C
THEORY/TUTORIAL/STUDIO						
1.	UMCD101	Communication Skills	2	0	0	4
2.	UMCD102	Introduction to Design	1	0	2	4
3.	UMCD103	Fundamentals and Principles of Art	1	0	3	5
4.	UMCD104	Computer Fundamentals and Operation	2	0	2	6
5.	UMCD171	Drawing and Illustration Technique	0	0	5	5
6.	UMCD191	Design Studio – I (Digital Drawing Technique)	0	0	5	10
TOTAL			6	0	17	**34**
Total Contact Hours: 23						
Total Credit: 34						

SEMESTER II

SL. NO.	COURSE CODE	COURSE TITLE	L	T	P/S*	C
THEORY/TUTORIAL/STUDIO						
1.	UMCD201	Professional Ethics & Human Value	2	0	0	4
2.	UMCD202	Introduction to Computer Programming	2	0	4	8
3.	UMCD203	Introduction to Multimedia Communications	2	0	2	6
4.	UMCD204	Introduction to Photography and Videography	1	0	4	6
5.	UMCD205	Introduction to Graphic Design	1	0	4	6
6.	UMCD291	Design Studio – II (Graphic Design project)	0	0	5	10
TOTAL			8	0	19	**34**
Total Contact Hours: 27						
Total Credit: 34						

Course Title: COMMUNICATION SKILLS
Course Code: UMCD101 L-
T-P-C: 2-0-0-4

MODULE	TOPIC	COURSE CONTENT
1	**Grammar**	Correction of sentence, Vocabulary / word formation, Single word for a group of words, Fill in the blank, transformation of sentences, Structure of sentences – Active / Passive Voice – Direct / Indirect.
2	**Narration**	Essay – Descriptive – Comparative – Argumentative – Thesis statement- Structure of opening / concluding paragraphs – Body of the essay.
3	**Reading Comprehension**	Global – Contextual – Inferential – Select Passages from recommended text.
4	**Business Correspondence**	Letter Writing – Formal. Drafting. Bio-data-Resume - Curriculum Vitae.
5	**Report Writing**	Structure, Types of report – Practice Writing.
6	**Communication and Public Speaking Skill**	Communication Process-meaning, principles of effective communication (barriers and solutions), Introduction to the sounds of English, Features of effective speech, verbal-nonverbal.
7	**Group Discussion**	Principle – practice.

TEXTBOOKS / REFERENCES:

1. S R Inthira & V Saraswathi " *Enrich your English – a) Communication skills b) Academic skills* " Publisher CIEFL & OUP
2. R.C. Sharma and K.Mohan , "*Business Correspondence and Report Writing*", Tata McGraw Hill , New Delhi, 1994
3. L.Gartside , "*Model Business Letters*" , Pitman , London , 1992
4. Longman, "*Longman Dictionary of Contemporary English*" (or '*Oxford Advanced Learner's Dictionary of Current English*', OUP, 1998.
5. Maxwell Nurnberg and Rosenblum Morris , "*All About Words*" , General Book Depot, New Delhi , 1995
6. *Written Communication in English* by Sara-Freeman – Orient Longman

Course Title: INTRODUCTION TO DESIGN
Course Code: UMCD102 L-
T-P-C: 1-0-2-4

MODULE	TOPIC	COURSE CONTENT
1	**UNIT – 1 Introduction**	Introduction of Design. Arts and Social Sciences. Design as a creative professional career. Interrelationship of Design to Engineering. Inter-relationship of 2D & 3D forms.
2	**UNIT – 2 History**	Brief history of developments in Design and Technology. Aesthetics, Ergonomic, Scientific and Engineering considerations in Design.
3	**UNIT – 3 Understanding Design**	Case studies in Product, Communication, and Environment Designs. Stages in the design processes. Design and indigenous technology.
4	**UNIT – 4 Role of Design**	Role of Design in creating the future. Status of Design profession in India and worldwide.

TEXTBOOKS / REFERENCES:

1. D. Norman, *Design of Everyday Things,* Currency Books, New York, 1990.
2. R. Hollis, *Concise History of Graphic Design,* Thames and Hudson, 1994.
3. P. Sparke, *Introduction to Design and Culture in the 20th Century*, Routledge, 1986.
4. J. Guy, *20th Century Design*, Thames and Hudson, 1993.
5. M.A. Muser and D.Macleon, *Art and Visual Environment,* MIT Press, 1996.
6. Visual Intelligence, Donald D. Hoffman, 2000
7. M.N. Horenstein, *Design Concepts for Engineers,* Prentice Hall UK, 2002.
8. J.H. Earle, *Engineering Design Graphics,* Addition Wesley, 2003.

Course Title: FUNDAMENTALS AND PRINCIPLES OF ART
Course Code: UMCD103 L-
T-P-C: 1-0-4-6

MODULE	TOPIC	COURSE CONTENT
1	**Elements of Art**	Shape, Form, Texture, Space,
2	**Principles of Art**	Balance, Movement, Emphasis, Variety, Unity, Pattern, Art Media and Techniques, Drawingand Painting-Sculpture, Architecture, Pottery, Weaving, body painting/printing and adornments *(clothing, tattoo and jewellery)*, Printmaking and Photography, Crafts, Graphic Design and Computer Art. The styles and forms of Art *(paintings, sculpture and applied art).*
3	**Two-Dimensional Art**	Influences of Western Art such as Impressionism, Expressionism, Cubism, Surrealism, Abstract Expressionism, Realism, Popular (Pop) Art, Optical (Op) Art, Minimalism, Photo-realism, Conceptual Art.
4	**Three-Dimensional Art**	Sculptures, statues, installations, kinetic art and performance art.
5	**Aesthetic theories**	Realism, emotionalism, formalism, feminism, and constructivism.

TEXTBOOKS / REFERENCES:

1. *Art Fundamentals: Theory and Practice* by Otto G. Ocvirk, Robert Stinson, Philip R. Wigg, Robert O. Bone, David L. Cayton
2. *The Elements of Art and Composition* by Brenda Ellis. Publisher: Artistic Pursuits Inc. Comb-binding, 92 pages, 68 lessons, 186 illustrations. ISBN: 978-1-939394-08-8, January 1, 2013, 3rd Edition
3. Fred, S. Kleiner, "*Gardener's Art through Ages*", Harcourt College Publishers, 2001.
4. Bernard S. Myers, *Understanding the Arts*, Holt, Rinehart and Winston Inc, 1964
5. Edith Thomory, "*A History of Fine Arts in India and the West"*, Orient Longman Publisher's Pvt.Ltd, 1982
6. H.H. Arnason, "*History of Modern Art*", Thames and Hudson, 1977.

Course Title: COMPUTER FUNDAMENTALS AND OPERATION
Course Code: UMCD104 L-
T-P-C: 2-0-2-6

MODULE	TOPIC	COURSE CONTENT
1	**Definition and History of computer**	Definition of Electronic Computer, History, Generations, Characteristic and Application of Computers, Classification of Computers, Computer Languages, Generation of Languages, Algorithm, Flow charts.
2	**Components of computer system**	Components of Computer system, Memory– different types, functions, concept of I/O devices. Types of software, Role of Operating System
3	**Number system**	Number system -Decimal, binary, octal, hexadecimal number systems and conversion from one system to another, Coding System -ASCII, EBCDIC
4	**Fundamentals of networking**	Fundamentals of networking – network topology, concept of LAN, WAN, MAN, network devices – NIC, hub, bridge, switch, repeaters,gateway, modem, transmission media
5	**Basics of Internet and Web technology**	Internet and World Wide Web: Hypertext Markup Language, DHTML,WWW, Gopher, FTP, Telnet, Web Browsers, Net Surfing, Search Engines, Email, Benefits and impact of e-commerce,
6	**Introduction to MS Office**	Basic feature of MS Office, Office Tools, MS Excel, MS PowerPoint.

TEXTBOOKS / REFERENCES:

1. *Computer Fundamentals*, Pradeep K Sinha, Priti Sinha
2. Rajaraman, *Introduction to Computers*, PHI
3. *Learning Word for Windows*: Rajib Mathur
4. *ABC of Office*: Han

Course Title: DRAWING AND ILLUSTRATION TECHNIQUE
Course Code: UMCD171 L-
T-P-C: 0-0-5-5

MODULE	TOPIC	COURSE CONTENT
1	**Drawing Man- Made Objects**	Drawing from cubes, cones, cylindrical object, casts, drapery, and still life groups etc.
2	**Nature drawing**	Nature drawing to develop the sense of structure. Study from any kind of forms in nature-pods, shells, butterflies, flowers, plants, insects, minerals bones etc. To understand how these forms achieve their structural unity through adherence to principles with physical nature of the material being observed and studied through various rendering media and techniques in various light conditions.
3	**Nature drawing from human figures**	Nature drawing from human figures – mainly based on general form and gesture – Head study. Drawing from Memory – To develop the sense of observation and the capacity to retain and recall images and their co-ordinations**.**
4	**Introduction to Elements of Perspective**	Study of basic solids, plan and elevation main aspects of parallel and 2 angular perspective.
5	**Calligraphy**	Basic discipline of beautiful handwriting, sense of letter form – Simultaneous judgment of the composition of the letters – spacing – organization – intuitive and logical planning of writing – development of style. A Co-ordinate series of assignments of script writing with different types of traditional and modern tools. Students be exposed to Calligraphic examples of various traditional scripts.
6	**Outdoor sketching**	Rapid sketching from any objects from places like – streets, market, stations etc. and also from Museums and Zoo etc. Students should be exposed to such drawing made by master artists of different times.

TEXTBOOKS / REFERENCES:

1) Drawing By Daniel Marcus Mendelowitz
2) *Dynamic Figure Drawing* Watson-Guptill Publications, 1996
3) *Keys to drawing* By Bert Dodson
4) *Drawing: Space, Form, and Expression* Wayne Enstice, Melody Peters
5) *Drawing distinctions: the varieties of graphic expression* By Patrick Maynard
6) *Basic figure drawing techniques* By Greg Albert
7) *Secrets to Drawing Realistic Children* By Carrie Stuart Parks, Rick Park

Course Title: DESIGN STUDIO – I (DIGITAL DRAWING TECHNIQUE)
Course Code: UMCD191 L-
T-P-C: 0-0-5-10

MODULE	TOPIC	COURSE CONTENT
1	**Project 1**	**Project based on following contents:** Implementation of design or art elements & principle on drawing.
2	**Project 2**	**Project based on following contents:** Graphic Design and Computer Art. The styles and forms of Art *(paintings, sculpture and applied art).* Basic Typo design, Basic concept of Photography, Natural Study Perspective knowledge, Outdoor study, Calligraphy Life drawing etc.
3	**Project 3**	**Project based on following contents:** Basic type of Animation movie concept, Doodle Design, Handmade drawing or Sketches implement on digital print making techniques etc.
4	**Project 4**	**Final design based project report**

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Course Title: PROFESSIONAL ETHICS AND HUMAN VALUE
Course Code: UMCD201
L-T-P-C: 2-0-0-4

MODULE	TOPIC	COURSE CONTENT
1	**Engineering Ethics**	Senses of 'engineering ethics' – variety of moral issues – types of inquiry – moral dilemmas – moral autonomy – Kohlberg's theory – Gilligan's theory – consensus and controversy – professions and professionalism – professional ideals and virtues – theories about right action – self-interest – customs and religion – uses of ethical theories
2	**Engineering as Social Experimentation**	Engineering as experimentation – engineers as responsible experimenters – codes of ethics – a balanced outlook on law – the challenger case study
3	**Responsibility for Safety**	Safety and risk – assessment of safety and risk – risk benefit analysis – reducing risk.
4	**Responsibilities and Rights**	Collegiality and loyalty – respect for authority – collective bargaining – confidentiality –conflicts of interest – occupational crime – professional rights – employee rights – intellectual property rights – discrimination
5	**Global Issues**	Multinational corporations – environmental ethics – computer ethics – weapons development –engineers as managers – consulting engineers – engineers as expert witnesses and advisors – moral leadership – sample code of conduct

TEXTBOOKS / REFERENCES:

1. Mike Martin and Roland Schinzinger, "*Ethics in Engineering*", McGraw Hill, New York, 1996.
2. Charles D Fleddermann, "*Engineering Ethics*", prentice Hall, New Mexico, 1999.
3. Laura Schlesinger, "*How Could You Do That: The Abdication of Character, Courage, and Conscience*", Harper Collins, New York, 1996.
4. Stephen Carter, "*Integrity*", Basic Books, New York, 1996.

Course Title: INTRODUCTION TO COMPUTER PROGRAMMING
Course Code: UMCD202 L-
T-P-C: 2-0-4-8

MODULE	TOPIC	COURSE CONTENT
1	**Fundamentals of Computer**	History of Computer, Generation of Computer, Classification of Computers, Basic Anatomy of Computer System, Primary & Secondary Memory, Processing Unit, Input & Output devices. Binary & Allied number systems representation of signed and unsigned numbers, BCD, ASCII, Binary. Arithmetic & logic gates. Assembly language, High level language, compiler and assembler (basic concepts).Basic concepts of operating systems like MS DOS, MS WINDOW, UNIX, Algorithm & flow chart.
2	**C Fundamentals**	The C character set, identifiers and keywords, data type & sizes, variable names, declaration, statements
3	**Operators and Expressions**	Arithmetic operators, relational and logical operators, type conversion, increment and decrement operators, bitwise operators, assignment operators and expressions, precedence and order of evaluation. Input and Output: Standard input and output, formatted output – printf, formatted input scanf.
4	**Flow of Control**	Statement and blocks, if-else, switch, loops – while, for, do while, break and continue, goto and labels.
5	**Fundamentals and Program Structures**	Basic of functions, function types, functions returning values, functions not returning values, auto, external, static and register variables, scope rules, recursion, function prototypes, C preprocessor, command line Arguments.
6	**Arrays and Pointers**	One dimensional arrays, pointers and functions, multidimensional arrays.
7	**Structures, Unions and Files**	Basic of structure, structures and functions, arrays of structures, bit fields, formatted and unformatted files.

TEXTBOOKS / REFERENCES:

1. Kerninghan, B.W. *The Elements of Programming Style*.
2. Yourdon, E. *Techniques of Program Structures and Design*.
3. Schied F.S. *Theory and Problems of Computers and Programming*.
4. Gottfried. *Programming with C*. Schaum.
5. Kerninghan B.W. & Ritchie D.M. *The C Programming Language*
6. Rajaraman V. *Fundamental of Computers.*
7. Balaguruswamy. *Programming in C.*
8. Kanetkar Y. *Let us C*.
9. M.M. Oka. *Computer Fundamentals*, EPH
10. Leon. *Introduction to Computers*, Vikas
11. Leon. *Fundamental of Information Technology*, Vikas
12. Ram B. *Computer Fundamentals*, New Age International
13. Ravichandran D. *Programming in C*, New Age International

Course Title: INTRODUCTION TO MULTIMEDIA COMMUNICATIONS
Course Code: UMCD203 L-
T-P-C: 2-0-2-6

MODULE	TOPIC	COURSE CONTENT
1	**Introduction**	Introduction to Multimedia; Definition, History and Applications of Multimedia; Characteristics of Multimedia; Components of Multimedia System; Static and Continuous Media
2	**Analog and Digital Signals**	Analog and Digital Signals; Analog to Digital and Digital to Analog Conversion.
3	**Data Compression**	Types of Data Compression; Introduction to Various Compression Techniques– Shannon Fano, Huffman Coding, LZW Coding, Run-Length Encoding, JPEG, MPEG.
4	**Elements of Multimedia**	Understanding the Elements of Multimedia– Text, Still Images, Graphics, Audio, Video and Animation.
5	**The WWW**	Overview of the Internet; Web Browsers, Internet Services- URL, Dial-ups, ISDN, E- mail, Chat, Cross-Platform Features, Audio & Video Streaming; Internet Applications – Audio & Video conferencing, Internet telephony, World Wide Web, Computer Networks.
6	**Virtual Reality**	Introduction to Virtual Reality; VR- Systems; VR Tools.

TEXTBOOKS / REFERENCES:

1. Tay Vaughan, *Multimedia: Making It Work*, Ninth Edition, Tata Mc-Graw Hill Education, 2014.
2. Jennifer Coleman Dowling, *Multimedia Demystified*, First Edition, Mc-Graw Hill, 2012.
3. Ze-Nian Li and Mark S. Drew, *Fundamentals of Multimedia*, First Edition, Eastern Economy Edition, PHI Learning Pvt. Ltd.
4. Patrick Buckley, Frederic Lardinois and DODOcase, *Virtual Reality Beginner's Guide + Google Cardboard Inspired VR Viewer*, Regan Arts, 2014, ISBN-10: 1941393101, ISBN-13: 978-1941393109.

Course Title: INTRODUCTION TO PHOTOGRAPHY AND VIDEOGRAPHY
Course Code: UMCD204 L-
T-P-C: 1-0-4-6

MODULE	TOPIC	COURSE CONTENT
1	**Basics of Photography**	Introduction to Photography, History of camera, Types of camera, Principles of photography, Rule of Third, Golden Ratio.
2	**Parts of Still Camera**	Aperture, shutter speed, lens, filters and flash, Camera films.
3	**Basics of Videography**	Basic components of video camera, Basic shots and shot composition, Camera angles and movements, Camera mountings, camera control unit, Focus & Defocus.
4	**Lighting for Photography and Videography**	What is lighting? Importance of lighting in photography & Videography, Lighting equipment and control, Lighting techniques and problems.
5	**Theory of Colours**	Origin of Colour, Colour Temperature, White Balance: Process and Need.

TEXTBOOKS / REFERENCES:

1. Wells, Liz, *Photography*, ISBN 978-0-415-46087-3.
2. Kobre, Kenneth, *Photo journalism*, Focal Press, IBSN 978-0-7506-8593-1
3. Millerson Gerold, *Television Production*, Focal Press.
4. Zettl, Herbert, *Handbook of Television Production*, Cengage Learning India Private Limited, Alps Building Ist Floor, 56-Janpath, New Delhi-110001, Reprint 2008 ISBN: 13 : 978-81-315-0508-3.
5. Belavady Vasuky, *Video Production*, Oxford Publication.

Course Title: INTRODUCTION TO GRAPHIC DESIGN
Course Code: UMCD205 L-
T-P-C: 1-0-4-6

MODULE	TOPIC	COURSE CONTENT
1	**UNIT - 1**	Introduction to elements of graphic design – Text and image, grids and layout, composition, form and function, figure and ground phenomenon. Typographic fonts and their characters.
2	**UNIT - 2**	Gestalt Laws
3	**UNIT - 3**	Typographic parameters: x-height, ascenders, descenders, kerning, tracking and leading. Variations of body text, headlines and display text. Grid in graphic design.
4	**UNIT - 4**	Hands on practice in applications of fundamentals of Graphic Design.
5	**UNIT - 5**	Introduction to Printing Technology. Introduction to Digital Media Technology. Case studies

TEXTBOOKS / REFERENCES:

1. Swan, *The new Graphic Design School*, VNR, 1997.
2. R. Carter and P. B. Meggs, *Typographic Design: Form and Communication*, John Wiley & Sons, 2000.
3. A. Darley, *Visual Degital Culture*, Routledge, 2000.
4. M. A. Muser and D. Macleon, *Art and Visual Environments*, MIT Press, 1996.
5. R. Hollis, *Concise History of Graphic Design*, Thames & Hudson, 1994.
6. P. B. Meggs, *Type and Image: the language of graphic Design*, VNR, 1992.
7. A. White, *Type of use: effective typography for electronic publishing*, New York Design Press, 1992.

Course Title: DESIGN STUDIO – II (GRAPHIC DESIGN PROJECT)
Course Code: UMCD291
L-T-P-C: 0-0-5-10

MODULE	TOPIC	COURSE CONTENT
1	**Project 1**	**Project based on following contents:** Application of Elements of graphic design - Text and image, grids and layout, composition, form and function, figure and ground phenomenon. Typographic fonts and their characters.
2	**Project 2**	**Project based on following contents:** Gestalt Laws and its practical application.
3	**Project 3**	**Project based on following contents:** Applications of Typography in hypothetical and real projects.
4	**Project 4**	**Project based on following contents:** Application of Printing Technology and Digital Media Technology.

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