UNIVERSITY POLYTECHNIC
B.I.T., MESRA, RANCHI

Syllabus of Diploma in Engineering (Computer Engineering)   (Semester III)

COURSE STRUCTURE
(W.E.F. 2011 Batch Students)
(Total Unit 7.5)

Course Code	Theory	Unit	Course Code	Sessional	Unit
DEC 3001	Basic Electronics	1.0	DEC 3002	Basic Electronics Lab.	0.5
DAM 3001	Applied Mechanics	1.0	DAM 3002	Applied Mechanics Lab.	0.5
DCP 3005	C Programming	1.0	DCP 3006	C Programming Lab.	0.5
DCP 3003	Database Management System	1.0	DCP 3004	DBMS Lab.	0.5
DMA 3001	Mathematics III	1.0	DGA 3002	PT & Games/Creative Arts/NSS	0.5
		5.0			**2.5**
			DHU 3002	Comm. Practice WS-II	0.5 (NC)

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Subject : Mathematics III   **Course Code : DMA 3001**

Module 1 and Module 2
Differential Equations :
Degree and order of D.E., Formation. Variable separable method. homogeneous differential equations. D.E. reducible to homogeneous forms. Linear D.E. (Bernoulli's forms not required).
                                                                                            (5)
Higher order differential equation with constant co-efficient. Complementary functions and rules for finding particular integrals.   (5)

Module 3
Statics :
Parallelogram law of forces. Resolution for forces, Triangle of forces. Lami's Theorem. Parallel forces, Moments, Couples.   (5)

Module 4 and Module 5
Dynamics :
Rectilinear motion projectiles, Projectiles, Motion on inclined planes.   (5)
Work, Energy and Power, Collision of elastic bodies (direct impact).   (5)

Module 6
Statistics :
Frequency distribution, Histogram   (5)

Module 7
Polygon, Measures of central Tendencies (Mean. Median Mode), S.D. and variance.   (5)

Books Recommended
Modern Approach to intermediate vector analysis – Das Gupta & Prasad
Engineering Mathematics – Bali, Saxena, Iyengar. – Laxmi Publication
Statics Via Vector – A. Ghatuary
Dynamics via calculus – A. Ghatuary

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Subject : Basic Electronics   **Course Code : DEC 3001**

Module 1 :
Introduction to semiconductors, PN junction, Characteristics of Semiconductor diodes, biasing of P-N junction, Zener diode – characteristics and applications, AC & DC load lines.
(10)

Module 2 :
Rectifiers : Half-wave, Full-wave Centre-tap and Bridge Rectifiers. Filters Circuits : Inductor Filter, LC filter, Multiple Filter, CLC or π filters, comparison of filter circuits.
(6)

Module 3 :
Fundamentals of transistors – operation and configurations. Transistor biasing techniques and stability factor.
(4)

Module 4 :
Small signal analysis of BJT's at low frequencies. Transistor Power Amplifiers – Circuit and Opertion of Class A, Class B, Class AB & Class C.
(6)

Module 5 :
Oscillation Criteria, R-C phase shift oscillator, CRO – functional block diagram and description. Applications of CRO.
(6)

Module 6 :
Op-Amps, ideal characteristics of op-amps, configurations of op-amps and applications, Active filter design.   (4)

Module 7 :
Number System – Binary, Octal, Decimal & Hexadecimal and their interconversions. Introduction to logic gates and their truth tables.
(4)

Books Recommended
1.   Electronic Devices & Circuits – Allan Mottershed
2.   Digital Electronics – B. R. Gupta & V. Singhal

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Subject : Applied Mechanics   **Course Code : DAM 3001**

Module 1 :
FORCES
Introduction, Composition & Resolution of forces, Parallelogram law of forces, Triangle of forces, Lami's theorem, Polygon of forces, Parallel Force, Forces acting in the same and opposite direction, Resultant.   (5)

Module 2 :
MOMENTS & EQUILIBRIUM
Moments : Definition, Graphical representation of moment, physical meaning, positive and negative moment, Algebraic sum of moments, Generalised theorem of moments, Moment about an axis, couples, theorem related to couples.
Equivalent forces & Moments, Equilibrium of rigid bodies, General condition of equilibrium, Action & reactions, freebody diagrams calculation of reactions, System of Forces : (a) Colinear forces (b) Non colinear forces in a plane   (7)

Module 3 :
CENTRE OF GRAVITY & MOMENT OF INERTIA
C.G. of triangles, rectangles, circle and solid bodies, Area moment of inertia and mass moment of inertia.   (4)

Module 4 :
FRICTION
Law of Static friction, Limiting friction, angle of friction, wedge.   (4)

Module 5 :
RECTILINEAR AND CURVILINEAR MOTION
Motion Rectilinear : Laws of motion, equations of rectilinear motion, Rectilinear motion rectilinear motion under gravity, speed, velocity and acceleration, relative velocity, projectiles.
Motion Curvilinear : Definition of curvilinear motion, equation of curvilinear motion, equation of motion for rotating bodies Dynamic equilibrium.   (9)

Module 6 :
WORK, POWER & ENERGY
Definitions, Potential energy, Kinetic energy, derivation of potential energy and kinetic energy, principle of conservation of energy, Motion of the centre of mass of a system of particles, Impulse & Momentum.   (6)

Module 7 :
LIFTING MACHINES
Definition, Irreversible Machine, Helix and Screw and Screw Jack.   (5)

Books :
   1. Engineering Mechanics – S. Rammamruthan
   2. Engineering Mechanics – I. B. Prasad
   3. Engineering Mechanics – R. S. Khurmi

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Subject : C Programming   **Course Code : DCP 3005**

Module 1:   **04 Lectures**
Introduction to C Programming: Structure of a C Program; Data-types, variables and constants; Keywords and identifiers.

Module 2:   **06 Lectures**
Managing Input and Output: Formatted input and output functions— printf() and scanf(); Character input and output functions— getchar() and putchar(); string input and output functions— gets() and puts().

Module 3:   **04 Lectures**
Operators and expressions: Arithmetic operators; precedence of operators; increment and decrement operators; assignments operators; Writing arithmetic expressions; Type casting; arithmetic functions— pow(), sqrt(), sin(), cos() and tan().

Module 4:   **08 Lectures**
Decision Making and Looping: if statement; if…else statements; Character testing functions— isupper(), islower(), isalpha(), isdigit(), isalnum(); conversion functions— toupper() and tolower(); switch-case and goto statement; for loop, while and do-while loops; break and continue.

Module 5:   **06 Lectures**
Arrays and strings: Defining Array; One-dimensional arrays; Two-dimensional arrays; String storage and processing; String handling functions— strlen(), strcat(), strcpy(), strcmp(), strcmpi(), atoi() and itoa().

Module 6:   **08 Lectures**
Function and Pointers: Return values and their types, calling a function, Call by value, Call by reference, category of functions, nesting of function; recursion. Declaration and initialization of pointers; accessing a variable through its pointer.

Module 7:   **04 Lectures**
Structures and Unions: Structure definition; declaration and initialization of structure variables; Storing value to structure members; Union; Difference between Structure and Union.

Textbook:
E. Balagurusamy, "Programming in ANSI C", TMH.

Reference Books:
B. S. Gottfied, "Programming with C",TMH

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Subject: - DBMS   **Course Code : DCP 3003**

Module 1:   **06 Lectures**
Introduction: Data base system Applications, Data base Systems versus Manual Systems, View of data, Data Models, database languages, database users and administrators, transaction management, database system structure, application architectures, history of database Systems.

Module 2:   **06 Lectures**
Entity Relationship Models: Basic concepts, Constraints Keys, design issues, entity relationship diagram, Weak entity sets, extended E - R features, Design of an E – R database schema, reduction of an E – R Schema of tables, the unified modeling language UML

Module 3:   **06 Lectures**
Relational Model: Structure of relational databases, the relational algebra, extended relational algebra operations, modification of the database, views, the tuple relational calculus, the domain relational calculus.

Module 4:   **04 Lectures**
Network Data Model: Network Database structure, Transaction Processing, Recovery and Concurrency Control, Locking,

Module 5:   **04 Lectures**
Introduction to distributed databases: Client server architecture, Data fragmentation, replication, allocation, types of Distributed databases.

Module 6:   **07 Lectures**
SQL: Background, basic structure, set operations, aggregate functions, null values, nested subqueries, views, Complex queries, modification of the database joined relations, data definition language, embedded SQL, dynamic SQL, SQL features.

Module 7:   **07 Lectures**
Relational Database design: Functional dependencies, Multivalued dependency, decomposition, properties decomposition, Normalization, 1NF, 2NF, 3NF, 4NF. Introduction to RDBMS.

Text Book:
Korth & Siberschatz, "Database System Concepts", 5e, McGraw Hill International edition.

Reference Book
Bipin C. Desai, "An Introduction to Database System", Galgotia Publication