SCHEME OF EXAMINATION

&

SYLLABI

FOR

MASTER OF COMPUTER APPLICATIONS (DUAL DEGREE)

OR

MCA (DD)

Offered By

**GURU GOBIND SINGH
INDRAPRASTHA
UNIVERSITY**

Guru Gobind Singh Indraprastha University
SECTOR - 16C, DWARKA, Delhi – 110 078 [INDIA]
www.ipu.ac.in

Eligibility condition for admission:

Pass 10+2 examination with Physics & Mathematics as compulsory subjects along with one of the Chemistry/ Biotechnology/ Biology/ Technical Vocational Subject and should obtain atleast 50% marks in the above subjects taken together. The candidate should also have passed English separately in the qualifying Examination.

SEMESTER - I				
Code	Paper	L	T/P	Credits
Theory				
MDD101	Personality Development & Communication Skills - I	4	-	4
MDD103	Introduction to Computers & IT	3	1	4
MDD105	Programming In C	3	1	4
MDD107	Mathematics – I	3	1	4
MDD109	Physics – I	3	1	4
Practical				
MDD 151	Office Automation Tools	-	6	3
MDD 153	Programming In C Lab.	-	4	2
MDD 155	Physics - I Lab.	-	4	2
	Total	16	18	27

SEMESTER - II				
Code	Paper	L	T/P	Credits
Theory				
MDD102	Personality Development & Communication Skills - II	4	-	4
MDD104	Discrete Mathematics	3	1	4
MDD106	Object Oriented Programming in C++	3	1	4
MDD108	Environmental Science	4	0	4
MDD110	Physics – II	3	1	4
MDD112	Principles of Management	4	-	4
Practical				
MDD 152	Object Oriented Programming in C++ Lab.	-	4	2
MDD 154	Physics - II Lab.	-	4	2
	Total	21	11	28

SEMESTER - III				
Code	**Paper**	**L**	**T/P**	**Credits**
Theory				
MDD201	Mathematics II	4	-	4
MDD203	Digital Electronics	3	1	4
MDD205	Data Structures	3	1	4
MDD207	Web Technologies – I	3	1	4
MDD209	Management Accounting	3	1	4
Practical				
MDD251	Digital Electronics	-	4	2
MDD253	Data Structures Lab.	-	4	2
MDD255	Web Technologies - I Lab	-	4	2
	Total	16	16	26

SEMESTER - IV				
Code	**Paper**	**L**	**T/P**	**Credits**
Theory				
MDD202	Industrial Economics	4	-	4
MDD204	Computer Architecture	3	1	4
MDD206	Algorithm Design and Analysis – I	3	1	4
MDD208	Web Technologies – II	3	1	4
MDD210	Database Management Systems	3	1	4
Practical				
MDD252	Algorithm Design and Analysis Lab.	-	4	2
MDD254	Web Technologies - II Lab.	-	4	2
MDD256	Database Management Systems Lab.	-	4	2
	Total	16	16	26

Approved in the Board of Studies of University School of Information & Communication Technology on 30th July, 2014. Approved in the AC Sub-Committee held on 31st July, 2014.

SEMESTER – V				
Code	Paper	L	T/P	Credits
Theory				
MDD301	Software Engineering	3	1	4
MDD303	Numerical and Scientific Computing	3	1	4
MDD305	Microprocessors and Interfacing	3	1	4
MDD307	Organizational Behaviour	4	-	4
MDD309	Java Programming – I	3	1	4
Practical				
MDD351	Numerical and Scientific Computing Lab.	-	4	2
MDD353	Microprocessors and Interfacing Lab.	-	4	2
MDD355	Java Programming - I Lab.	-	4	2
	Total	16	16	26

SEMESTER – VI				
Code	Paper	L	T/P	Credits
Theory				
MDD302	Operating Systems	3	1	4
MDD304	Programming Languages	3	1	4
MDD306	Management Information System	4	-	4
MDD308	Technical Writing	2	-	2
MDD310	Java Programming – II	3	1	4
Practical				
MDD352	Minor Project	-	14	7
MDD354	Java Programming – II	-	4	2
	Total	15	21	27

SEMESTER - VII				
Code	Paper	L	T/P	Credits
Theory				
MDD401	Object Oriented Software Engineering	3	1	4
MDD403	Theory of Computation	3	1	4
MDD405	Computer Graphics	3	1	4
MDD407	C# Programming	3	1	4
MDD409	Data Communications and Computer Networks	3	1	4
Practical				
MDD451	Computer Graphics	-	4	2
MDD453	C# Programming	-	4	2
MDD455	Term Paper - I*	-	4	2
	Total	16	16	26

SEMESTER - VIII				
Code	Paper	L	T/P	Credits
Theory				
MDD402	Data Warehousing and Data Mining	3	1	4
MDD404	Algorithm Design and Analysis - II	3	1	4
MDD406	Advanced Database Management Systems	3	1	4
MDD408	Compiler Design	3	1	4
MDD410	Advanced Computer Networks	3	1	4
Practical				
MDD452	Algorithm Design and Analysis - II	-	4	2
MDD454	Advanced Database Management Systems	-	4	2
MDD456	Term Paper - II*	-	4	2
	Total	15	17	26

*   NUES : No End Term Examination will be held. Marks out of 100 to be awarded by the institution faculty.

SEMESTER - IX				
Code	Paper	L	T/P	Credits
Theory				
MDD501	Linux Programming	3	1	4
MDD503	Software Testing	3	1	4
MDD505	Distributed Systems	3	1	4
Elective - I (Choose any one)				
MDD507	Software Project Management	3	1	4
MDD509	Multimedia Technologies	3	1	4
MDD511	Mobile Computing	3	1	4
MDD513	Artificial Intelligence	3	1	4
MDD515	Data Analysis	3	1	4
MDD517	Web Intelligence and Big Data	3	1	4
Elective - II(Choose any one)				
MDD519	Operations Research	3	1	4
MDD521	Advanced Computer Architecture	3	1	4
MDD523	Software Quality Management	3	1	4
MDD525	Digital Signal Processing	3	1	4
MDD527	Complexity Theory	3	1	4
Practical				
MDD551	Linux Programming Lab	-	4	2
MDD553	Software Testing	-	4	2
MDD555	Lab. Based on electives	-	4	2
	Total	15	17	26

SEMESTER - X				
Code	Paper	L	T/P	Credits
Practical				
MDD602	Dissertation	-	-	32

Note:

1. A student may not continue after 06 semesters, opting for the Bachelor of Computer Applications Degree. In this case, the credit requirement are as :

   Minimum Credit   :   150
   Maximum Credit   :   160

2. The students who continue to the 10th semester, (not opting for the Bachelor of Computer Applications Degree) to be awarded the degree of Master of Computer Applications. The credit requirement to be as :

   Minimum Credit   :   254
   Maximum Credit   :   270

MDD 101: Personality Development & Communication Skills - I

	L	T	C
	4	0	4

Unit-1

Practical grammar basic fundamental of grammar and usage, how to improve command over spoken and written English with stress o Noun, Verb Tense and Adjective. Sentence errors, Punctuation, Vocabulary building to encourage the individual to communicate effective and diplomatically, common errors in business writing.

Unit-II

Introduction to Business Communication: Basic forms of communication, Process of communication, Principles of effective Business Communication, 7 Cs. Media of Communication: Types of communication: Barriers of communication (Practical exercise in communication)

Unit-III

Business letter writing: Need, Functions and Kinds. Layout of letter writing. Types of letter writing: Persuasive letters, Request letters, Sales letters, Complaints and Adjustments. Departmental Communication: Meaning, Need and types: Interview letters, Promotion Letters, resignation letters, news letters, Circulars, Agenda, Notice, Office memorandums, Office orders, Press release.

Unit-IV

Aids to correct Business writing, Practical Grammar (basic Fundamentals), Sentence errors-Punctuation, Vocabulary building. Business Etiquettes , Business manners. Body language gestures, Etiquette of the written word, Etiquette of the telephone, Handling business meetings. Role play on selected topics with case analysis and real life experiences.

Text Books:

1. Wren, Percival Christopher, and Wren Martin. "High School English Grammar and Composition". S. Chand, 2005.
2. Sinha, K. K.; Business Communication, Galgotia Publishers, 2003.
3. Robinson, David Foster. "Business etiquette: your complete guide to correct behaviour in business". Vol. 6. Kogan Page Publishers, 2000.
4. Roget, Peter Mark." Roget's Thesaurus of English Words and Phrases..." TY Crowell Company, 1911.

Reference Books:

1. Thesaurus, Rogets. "Hand Book of Practical Comunication Skills", Chrissie Wrought.
2. Reuben, Ray. "Communication Today: Understanding Creative Skills.", 1997.

MDD-103: Introduction to Computers & IT

	L	T	C
	3	1	4

UNIT I

Five Component Model of a Computer, System and Application software (introduction) storage devices , primary (RAM, ROM, PROM, EPROM, cache) Memory and secondary (magnetic tape, hard disk, Compact disks) memory , peripheral devices , printers

UNIT II

Operating Systems: DOS Internal, External commands, Windows (2000 and NT) , Overview of architecture of Windows , tools and system utilities including registry , partioning of hard disk , Overview of Linux architecture , File system , file and permissions , concept of user and group , installation of rpm and deb based packages

UNIT III

Basics of programming through flow chart , Networking Basics - Uses of a network and Common types of networks , Network topologies and protocols , Network media and hardware , Overview of Database Management System.

UNIT IV

Libre / Open Office Writer : Editing and Reviewing, Drawing, Tables, Graphs, Templates
Libre / Open Office Calc : Worksheet Management , Formulas, Functions, Charts
Libre / Open Office Impress: designing powerful power-point presentation

Text Books:

1. Norton, Peter. "Peter Norton's introduction to computers". Glencoe/McGraw-Hill, 1996.
2. Andrews, Jean. "A+ Guide to Managing & Maintaining Your PC". Cengage Learning, 2013.

Reference Books:

1. Assocs, Joiner, and Inc Staff. "Flowcharts: Plain & Simple". Oriel Incorporated, 1995.
2. http://www.openoffice.org/why/
3. http://www.libreoffice.org/get-help/documentation/

MDD-105 : Programming In C

L	T	C
3	1	4

UNIT I

Concept of algorithms, Flow Charts, Overview of the compiler (preferably GCC) , Assembler, linker and loader , Structure of a simple HelloWorld Program in C ,Overview of compilation and execution process in an IDE (preferably CodeBlock)

UNIT II

Programming using C: Preprocessor Directive, C primitive input output using getchar and putchar , simple I/O Function calls from library , data type in C including enumeration , arithmetic, relational and logical operations, conditional executing using if, else, switch and break .Concept of loops , for, while and do-while , Storage Classes: Auto, Register, Static and Extern

UNIT III

Arrays (one and two dimensional),2-d arrays used in matrix computation. Concept of Sub-programming, functions. Parameter transmission schemes i.e. call by value and call by reference , Pointers, relationship between array and pointer, Argument passing using pointers, Array of pointer, passing arrays as arguments

UNIT IV

Structure and unions , Strings and C string library, File Handling in C Using File Pointers,fopen( ), fclose( ),Input and Output using file pointers, Character Input and Output with Files , String Input / Output Functions , Formatted Input / Output Functions,Block Input / Output Functions, Sequential Vs Random Access Files , Positioning the File Pointer

Text Books:

1. Schildt, Herbert. "*C:* the complete reference". Tata McGraw-Hill Education, 1988.
2. Forouzan, Behrouz A., and Richard F. Gilberg. "Computer science: A structured programming approach using C". Brooks/Cole Publishing Company, 2000.

Reference Books:

1. Kernighan, Brian W., and Dennis M. Ritchie. "The C programming language". Vol. 2. Englewood Cliffs: prentice-Hall, 1988.
2. Salaria, R. S. "Application Programming in C." Khanna Publishers, 2010.
3. Kanetkar, Yashavant P. "Test Your C Skills". BPB Publications, 2003.
4. http://www.codeblocks.org/
5. http://gcc.gnu.org/

MDD 107 : Mathematics – I

L	T	C
3	1	4

Unit-1

Calculus of functions of One variable, Successive Differentiation, Leibnitz's theorem (without proof). Lagrange's Theorem, Cauchy Mean value theorems, Taylor's theorem (without proof), Remainder term, Asymptotes, Curvature, Curve Tracing.

Unit-II

Infinite Series: Convergence, divergence, Comparison test, Ration Test, Cauchy n^{th} root test, Leibnitz's test (without proof), Absolute and Conditional Convergence, Taylor and Meclaurin series, Power Series, Radius of Convergence.Integral Calculus: Reduction Formulae of trigonometric functions, Properties of definite Integral, Applications to length, area, volume, surface of revolution, Definition of improper integrals, Beta-Gamma functions.

Unit-III

Calculus of Functions of several variables:Partial derivatives, Chain rule, Differentiation of Implicit functions, Exact differentials. Maxima, Minima and saddle points, Method of Lagrange multipliers. Differentiation under Integral sign, Jacobians and transformations of coordinates. Double and Triple integrals. Simple applications to areas, Volumes etc.

Unit-IV

 Vector Calculus:Scalar and vector fields, Curves, Arc length, Tangent, normal, Directional Derivative, Gradient of scalar field, divergence and curl of a vector field. Line integral (independent of path), Green's theorem, Divergence theorem and Stoke's theorem (without proofs), Surface Integrals.

Text Books

1. Thomas, George Brinton, Ross L. Finney, and Maurice D. Weir. "Calculus and analytic geometry". Vol. 7. Reading, MA: Addison-Wesley, 1988.
2. Narayan, Shanti. "Differential calculus*". S. Chand, 2005.
3. Narayan, Shanti and P. K. Mittal. "Integral calculus". Chand, 2005.

Reference Books:

1. Grewal, Bhajan Singh, and J. S. Grewal. "Higher engineering mathematics". Vol. 7. Khanna Publishers, 2005.
2. Kreyszig, Erwin. "Advanced engineering mathematics". John Wiley & Sons, 2007.
3. Spiegel, Murray Ralph. "Schaum's outline of theory and problems of vector analysis and an introduction to tensor analysis." (1959).
4. Malik, S. C., and Savita Arora. "Mathematical analysis". New Age International, 1992.
5. Buck, Robert Creighton, and Ellen F. Buck. "Advanced calculus". Tata McGraw-Hill Education, 1965.
6. Widder, David Vernon. "Advanced calculus". Courier Dover Publications, 1989.
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MDD109: Physics-I

	L	T	C
	3	1	4

UNIT I

Interference: Introduction, Interference due to division of wave front: Fresnel's Biprism, Interference due to division of amplitude: wedge shaped film, Newton's rings.

Diffraction: Introduction, Difference between Fresnel and Fraunhofer diffraction, Single slit diffraction, Transmission diffraction grating, Absent spectra.

UNIT II

Polarization: Introduction, Uniaxial crystals, Double refraction, Nicol prism, Quarter and half wave plates, Theory of production of plane, circularly and elliptically polarized lights, Specific rotation, Laurents half shade polarimeter. **Laser:** Spontaneous and stimulated emissions, Einstein's coefficients, Laser and its principle, He-Ne laser.**Fibre optics:** Introduction, Single mode fibre, Step index and graded index multimode fibres, Acceptance angle and numerical aperture.

UNIT III

Theory of Relativity: Introduction, Frame of reference, Galilean transformation, Michelson-Morley experiment, Postulates of special theory of relativity, Lorentz transformations, Length contraction, Time dilation, Mass energy relation. **Ultrasonics:** Introduction, Production of ultrasonics by magnetostriction and Piezoelectric methods, Applications

UNIT IV

Nuclear Physics: Introduction, Radioactivity, Alpha decay, Beta decay, Gamma decay, Q value, Threshold energy, Nuclear reactions, Nuclear fission: Liquid drop model, Nuclear fusion, Particle accelerators: Linear accelerator, Cyclotron, Radiation detectors: Ionization chamber, Geiger Mueller Counter.

Text Books:

1. Beiser, Arthur, Shobhit Mahajan, and S. Rai Choudhury. "Concepts of modern physics". Tata McGraw-Hill Education, 2003.
2. H.K. Malik & A. K. Singh "Engineering Physics" Tata McGraw-Hill Education, 1st Edition, 2009.

Reference Books

1. A. Ghatak "Optics" , TMH, 5th Edition, 2013
2. G. Aruldhas "Engineering Physics" PHI 1st Edition, 2010.
3. Jenkins, Francis A., and Harvey E. White. "Fundamentals of optics". Tata McGraw-Hill Education, 1957.
4. Kittel, Charles, Walter D. Knight, and Malvin A. Ruderman. "Mechanics Volume 1 Berkeley Physics Course". McGraw Hill, 1962.
5. Feynman " The Feynman lectures on Physics Pearson Volume 3 Millennium Edition, 2013
6. Uma Mukhrji "Engineering Physics" Narosa, 3rd Edition, 2010.
7. A. S.Vasudeva, "Modern Engineering Physics", S. Chand, 6th Edition, 2013.

MDD 151: Office Automation Tools

L   T   C
0   6   3

1. Dismantling a PC Part -1
2. Dismantling a PC Part -2
3. Internal and External commands of DOS
4. System utilities of windows including regedit
5. Understanding and working knowledge of .Libre / Open Office Writer
   : Editing and Reviewing, Drawing, Tables, Graphs, Templates
6. Understanding and working knowledge of Libre / Open Office Calc
7. Understanding and working knowledge Libre / Open Office Impress
8. Understanding of flow chart development through Dia *
9. Two Mini Projects based on the skills learned in experiments 1-12

- [Dia] http://projects.gnome.org/dia/

MDD 153: Programming in C Lab

L	T	C
0	4	2

For program development an IDE e.g. CodeBlock[a] , Eclipse CDT [b], Netbeans[c] is recommended

1. Write a program to find divisor or factorial of a given number.

2. Write a program to find sum of a geometric series

3. Write a recursive program for tower of Hanoi problem

4. Write a recursive program to print the first m Fibonacci number

5. Write a menu driven program for matrices to do the following operation

   depending on whether the operation requires one or two matrices

Addition of two matrices, Subtraction of two matrices, Finding upper and lower triangular matrices

Transpose of a matrix, Product of two matrices.

6. Write a program to copy one file to other, use command line arguments.

7. An array of record contains information of managers and workers of a company.

   Print all the data of managers and workers in separate files.

8. Write a program to perform the following operators an Strings without using String

   functions

   To find the Length of String.

   To concatenate two string.

   To find Reverse of a string.

   To Copy one sting to another string.

9. Write a Program to store records of an student in student file. The data must be stored

   using Binary File.Read the record stored in "Student.txt" file in Binary code.Edit the record stored in

   Binary File.Append a record in the Student file.

10. Write a programmed to count the no of Lowercase, Uppercase numbers and special

    Characters presents in the contents of File.

11. Two Mini Projects based on the skills learned in experiments 1-10 [These mini projects may be

    done in a group not exceeding group size of 4]

    [a] http://www.codeblocks.org/

    [b] http://www.eclipse.org/cdt/

    [c] https://netbeans.org/features/cpp/

MDD155 : PHYSICS LAB – I

	L	T	C
	0	4	2

1. To determine the wavelength of sodium light by Newton's Rings.
2. To determine the wavelength of sodium light by Fresnel's biprism.
3. To determine the wavelength of sodium light using diffraction grating.
4. To determine the refractive index of a prism using spectrometer.
5. To determine the dispersive power of prism using spectrometer and mercury source.
6. To determine the specific rotation of cane sugar solution with the help of half shade polarimeter.
7. To find the wavelength of He-Ne laser using transmission diffraction grating.
8. To determine the numeral aperture (NA) of an optical fibre.
9. To plot a graph between the distance of the knife-edge from the center of the gravity and the time period of bar pendulum. From the graph, find

   (a) The acceleration due to gravity

   (b) The radius of gyration and the moment of inertia of the bar about an axis.

10. To determine the velocity of ultrasound waves using an ultrasonic spectrometer in a

    given liquid (Kerosene Oil).

11. To verify inverse square law.

12. To determine Planck's constant.

Text Books:

1. Arora, C. L. " Practical Physics". S. Chand, 1995.

Note: Any 8-10 experiments may be chosen out of the list given above. Proper error – analysis must

be carried out with all the experiments.

MDD102: Personality Development and Communication Skill-II

	L	T	C
	4	0	4

Unit –I
Project and report writing, and proposals – how to write an effective report, basics of project writing, paragraph writing, paper reading and voice modulation, basics of project presentation.

Unit II
How to make a presentation, the various presentation tools, along with guidelines of effective presentation, boredom factors in presentation and how to overcome them, interactive presentation & presentation as part of a job interview, art of effective listening.

Unit-III
Resume writing skills, guidelines for a good resume, how to face an interview board, proper body posture, importance of gestures and steps to succeed in interviews. Practice mock interview in classrooms with presentations on self. Self introduction – highlighting positive and negative traits and dealing with people with face to face.

Unit-IV
Leadership – quality of a leader, leadership quiz with case study, knowing your skills and abilities. Introduction to group discussion techniques with debate and extempore, increase your professionalism.

Audio Video recording and dialogue sessions on current topics, economy, education system, environment, politics.

Text Books:

1. Guffey, Mary Ellen, and Dana Loewy. "Essentials of business communication". Cengage Learning, 2012.
2. D.D.Sehgal,V.K.Mittal and N.C.Garg, "Business Communication", Ramesh Book Depot 2013.
3. Reuben, Ray; "Communication today – understanding creating skills", Himalaya Publishing House, 2001.

Reference Books:

1. McGrath, E. H. S. J. "Basic managerial skills for all". PHI Learning Pvt. Ltd., 2011.
2. Stephen, R. Covey. "The 7 habits of highly effective people". 2009.
3. Thesaurus, Rogets. "Hand Book of Practical Comunication Skills", Chrissie Wrought.

MDD104: Discrete Mathematics

L	T	C
3	1	4

UNIT- I

Formal Logic**:** Preposition, Symbolic Representation and logical entailment theory of Inferences and tautologies, Predicates, Quantifiers, Theory of inferences for predicate calculus, resolution.

Techniques for theorem proving: Direct Proof, Proof by Contraposition, proof by contradiction.

UNIT- II

Overview of Sets and set operations, permutation and combination, principle of inclusion exclusion (with proof) and pigeonhole principle (with proof), Relation, operation and representation of a relation, equivalence relation, POSET , Hasse Diagrams, extremal Elements, Lattices ,composition of function, inverse, binary and n-ary operations.

UNIT- III

Principle of mathematical induction, principle of complete induction, solution methods for linear and non-linear first-order recurrence relations with constant coefficients, Graph Theory: Terminology, isomorphic graphs, Euler's formula (proof) ,chromatic number of a graph, five color theorem(with proof), Euler &Hamiltonian paths.

UNIT-IV

Groups, Symmetry, subgroups, normal subgroups, cyclic group, permutation group and cayles's theorem(without proof), cosets lagrange's theorem(with proof) homomorphism, isomorphism, automorphism, rings, Boolean function, Boolean expression, representation & minimization of Boolean function**.**

Text Books:

1. Grimaldi, Ralph P. "Discrete and Combinatorial Mathematics", 5/e. Pearson Education India, 2006.
2. Rosen, Kenneth. "Discrete Mathematics and Its Applications 7th edition". McGraw-Hill Science, 2011.

Reference Books:

1. Kolman, Busby and Ross, "Discrete Mathematical Structures", PHI, 1996.
2. C.L. Liu, "Elements of Discrete Mathematics", TMH, 2000.
3. J. P. Trembly and P. Manohar, "Discrete Mathematical Structures with Applications to Computer Science", McGraw Hill, 1997.

MDD 106: OBJECT ORIENTED PROGRAMMING IN C++

	L	T	C
	3	1	4

UNIT- I

Object oriented programming concepts , Benefits of OOP, Applications of OOP , Introduction to C++, History of C++, Structure of C++, **Difference between C and C++** , Basic data types, Derived data types, Symbolic constants., Dynamic initialization, Type modifiers, Type Casting, Operator and control statements, Input and Output statements in C++. Classes and objects, class specification, member function specification, scope resolution operator, Access qualifiers, Instance creation, Member functions. Function prototyping, Function components, Passing parameters, call by reference, Return by reference, Inline functions, Default arguments, Overloaded function.

UNIT- II

Array of objects, pointers to objects, this pointer, Dynamic allocation operators, Dynamic objects.**,**Constructors ,default constructor , Parameterized constructors , Constructor with dynamic allocation ,copy constructor , destructors ,operator overloading, friend functions, overloading through friend functions , overloading the assignment operator ,static members Objects , pointers and objects ,constant objects ,nested classes , local classes

UNIT- III

Inheritance, Defining derived classes, Single inheritance, protected data with private inheritance, multiple inheritance, multi level inheritance, hierarchical inheritance, hybrid inheritance, multipath inheritance, Constructors in derived and base class, Abstract classes, virtual function and dynamic polymorphism, pure virtual functions, virtual destructor, Exception Handling, principle of Exception handling, Exception handling mechanism, multiple catch, Nested try, Rethrowing the exception.

UNIT-IV

Streams in C++, Stream classes, Formatted and Unformatted data, manipulators, User defined manipulators, file streams, file pointer manipulation, file open and close, Templates, Template functions and Template classes.

Text Books:

1. S. B. Lippman & J. Lajoie, " C ++ Primer" 3rd Edition, Addison Wesley, 2000.
2. Venugopal, K. R. "Mastering C++". Tata McGraw-Hill Education, 1997.
3. Lafore, Robert. "Object-oriented programming in Turbo C++". Galgotia publications, 2001.

Reference Books:

1. A.K. Sharma," Object Oriented Programming," Pearson Publication, 2014
2. Schildt, Herbert. "C++ Programming". John Wiley & Sons, 2004.
3. David Parsons. "Object oriented programming with C++". Cengage Learning EMEA, 2001.
4. Steven C. Lawlor, "The Art of Programming Computer Science with C++", Vikas Publication, 2004.
5. Yashwant Kanethkar, "Object Oriented Programming using C++", BPB Publications 2004.
6. B. Stroustrup, "The C++ Programming language", Third edition, Pearson Education, 2001.

Approved in the Board of Studies of University School of Information & Communication Technology on 30th July, 2014. Approved in the AC Sub-Committee held on 31st July, 2014.

MDD108: ENVIRONMENTAL SCIENCE

	L	T	C
	4	0	4

COURSE CONTENTS

Unit I   **Lectures – 14**

Ecosystems and how they work: Types of Eco - Systems, Geosphere – Biosphere and Hydrosphere introduction. Major issues of Biodiversity, Conservation of Bio – Diversity Concept of sustainability and international efforts for environmental protection: Concept of Sustainable Development, Emergence of Environmental Issues, Stockholm Conference on Environment, 1972 and Agenda 21. International Protocols, WTO, Kyoto Protocol, International Agreement on Environmental Management.

Unit II   **Lectures - 16**
Pollution and Public Policy Water Pollution: Water Resources of India, Hydrological Cycle, Methods Of Water Conservation and Management, River Action Plan, Ground and Surface Water Pollution; Waste Water Management. Air Pollution: Air Pollution and Air Pollutants , Sources of Air Pollution and its Effect on Human Health and Vegetations . Green House Effect, Global Warming and Climate Change. Solid Waste : Management – and Various Method Used, Composting, Land Fill Sites etc. Ha zardous Waste Management, Biomedical Waste Management .

Unit III   **Lectures - 16**
Environmental Impact Assessment (EIA) and Environmental Management System (EMS) : Introduction to EIA, its Impact, Notification of MOEF,Introduction to ISO 9000 and 14000 Standards,. Introduction to Indian Environmental laws : Legal framework: , the Indian Penal Code, Role of Judiciary in Environmental Protection, Wild Life (Protection) Act, 1972, Water (Prevention and Control of Pollution) Act, 1974, Environment (Protection) Act, 1986, Air
(Prevention & Control of Pollution) Act, 1981, Delhi Environment Law.

UNIT IV   **Hours 6**
Field work / Case Studies
: Visit to a related site – river / urban / rural or industrial and demonstration project including water bodies.

Text Books:

1. Basat, A. "Environment Studies", Pearson Education, 2008.
2. Nath, Manju, "Environment Studies", Pearson Education, 2008.

Reference Books:

1. Sayre, Donald Alford. "INSDE ISO 14000 : The Competitive Advantage of Environmental Management". CRC Press, 1996.
2. Gupta N.C., "Social Auditing of Environmental Law in India", Edited book, NewCentury Publications, 2006.
3. Divan, Shyam and Rosen Ceranz, Armin, "Environmental Law and Policy in India, Cases, materials   and statutes", Oxford University Press, 2007.
4. Bowles, Ian A. and Glenn T. Prickett, , "Footprints in the Jungle: Natural Resource, Industries, Infrastructure and Biodiversity Conservation", Oxford University Press, 2001.

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MDD110: Physics-II

	L	T	C
	3	1	4

UNIT I

Electromagnetic Theory : Gradient, Divergence, Curl, Gauss' law, Ampere's Law, Continuity equation, Maxwell's equations (differential and integral forms), Significance of Maxwell's equations, Poynting Theorem, Electromagnetic wave propagation in dielectrics and conductors.

UNIT II

Statistical Physics: Black body radiation, Planck's radiation formula, Wien's and Rayleigh-Jeans Laws, Distribution laws: Qualitative features of Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics & their comparison (without derivation).

Quantum Mechanics: Postulates of Quantum mechanics, de-Broglie hypothesis, Davisson Germer experiment, Wave function and its physical significance, Wave Packet, Phase and group velocities, Uncertainty principle, Schrodinger equation for free particle, Time dependent Schrodinger equation, Particle in a box (1-D).

UNIT III

Crystal Structure: Types of solids, Unit cell, Types of crystals, Translation vectors, Lattice planes, Miller indices, Simple crystal structures, Interplaner spacing, Crystal structure analysis: Bragg's law, Laue method, Point defects: Schottcky and Frankel defects.

UNIT IV

Band Theory of Solids: Introduction, Kronig-Penney model: E-k diagram, Effective mass of an electron, Intrinsic semiconductors: Electron concentration in conduction band, Hole concentration in valence band, Extrinsic semiconductor: p-type and n-type semiconductors, Fermi level, Hall effect: Hall voltage and Hall coefficient.

Text Books:

1. Arthur Beiser 'Concepts of Modern Physics', McGraw-Hill, 6th Edition 2009
2. H.K. Malik & A. K. Singh 'Engineering Physics' McGraw-Hill, I[st] Edition, 2009.

Reference Books:

1. Richard Wolfson "Essential University Physics" Pearson, Ist edition, 2009.
2. S.Vasudeva, "Modern Engineering Physics", S. Chand, 6th Edition, 2013.
3. Kittel, Charles, Walter D. Knight, and Malvin A. Ruderman. "Mechanics Volume 1 Berkeley Physics Course". McGraw Hill, 1962.
4. Kaplan, Irving. "Nuclear physics.", 1963.
5. Taylor, John Robert, Chris D. Zafiratos, and Michael Andrew Dubson. "Modern physics for scientists and engineers". Vol. 2. Pearson Prentice Hall, 2004.
6. Griffiths, David Jeffrey, and Reed College. "Introduction to electrodynamics. Vol. 3", Prentice hall, 1999.

MDD 112: Principles of Management

	L	T	C
	4	0	4

UNIT – I

Management: Concept, Nature, Importance; Management: Art and Science, Management As a Profession, Management Vs. Administration, Management Skills, Levels of Management, Characteristics of Quality Managers. Evolution of Management: Early contributions, Taylor and Scientific Management, Fayol's Administrative Management, Bureaucracy, Hawthorne Experiments and Human Relations, Social System Approach, Decision Theory Approach. Business Ethics and Social Responsibility: Concept, Shift to Ethics

UNIT – II

Introduction to Functions of Management, Planning: Nature, Scope, Objectives and Significance of Planning, Types of Planning, Process of Planning, Barriers to Effective Planning, Planning Premises and Forecasting, Key to Planning, Decision Making.

Organizing: Concept, Organization Theories, Forms of Organizational Structure, Combining Jobs: Departmentation, Span of Control, Delegation of Authority, Authority & Responsibility, Organizational Design.

UNIT – III

Staffing: Concept, System Approach, Manpower Planning, Job Design, Recruitment & Selection, Training & Development, Performance Appraisal, Directing: Concept, Direction and Supervision, Motivation: Concept, Motivation and Performance, Theories Of Motivation, Approaches for Improving Motivation, Pay and Job Performance, Quality of Work Life, Morale Building.

UNIT – IV

Leadership: The Core of Leadership: Influence, Functions of Leaders, Leadership Style, Leadership Development.Communication: Communication Process, Importance of Communication, Communication Channels, Barriers to Communication. Controlling: Concept, Types of Control, Methods: Pre-control: Concurrent Control: Post-control, An Integrated Control System, The Quality Concept Factors affecting Quality, Developing a Quality Control System, Total Quality Control, Pre-control of Inputs, Concurrent Control of Operations. Post Control of Outputs. Change and Development: Model for Managing Change, Forces for Change, Need for Change, Alternative Change Techniques, New Trends in Organisational Change.

Text Books:

1. Stoner, J. A. F., R. Edward Freeman, and Daniel R. Gilbert Jr. "Management " 1995:
2. Koontz , "Principles of Management", Tata Mc Graw Hill, 1st Ed., 2008.
3. Robbins, Stephen P., David A. DeCenzo, Mary K. Coulter, and Nancy Langton. "Fundamentals of management: essential concepts and applications". Pearson Prentice Hall, 2005.

Reference Books:

1. Robbins, Stephen P., David A. DeCenzo, Mary K. Coulter, and Nancy Langton."Fundamentals of management: essential concepts and applications". Pearson Prentice Hall, 2005.
2. Hillier Frederick S. and Hillier Mark S. " Introduction to Management Science: A Modeling and Case Studies Approach with Spreadsheets", Tata Mc Graw Hill, 2nd Ed., 2008.
3. Weihrich Heinz and Koontz Harold, "Management: A Global and Entrepreneurial Perspective", Mc Graw Hill, 12th Ed., 2008.
4. R. Satya Raju and A. Parthasarathy, "Management Text and Classes", PHI, 2nd Ed., 2009.

Approved in the Board of Studies of University School of Information & Communication Technology on 30th July, 2014. Approved in the AC Sub-Committee held on 31st July, 2014.

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MDD 152: Object Oriented Programming in C++ Lab

	L	T	C
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1. Write a program for multiplication of two matrices using OOP.
2. Write a program to perform addition of two complex numbers using constructor overloading. The first constructor which takes no argument is used to create objects which are not initialized, second which takes one argument is used to initialize real and imag parts to equal values and third which takes two argument is used to initialized real and imag to two different values.
3. Write a program to find the greatest of two given numbers in two different classes using friend function.
4. Implement a class string containing the following functions:
    - Overload + operator to carry out the concatenation of strings.
    - Overload = operator to carry out string copy.
    - Overload <= operator to carry out the comparison of strings.
    - Function to display the length of a string.
    - Function tolower( ) to convert upper case letters to lower case.
    - Function toupper( ) to convert lower case letters to upper case.
5. Create a class called LIST with two pure virtual function store() and retrieve().To store a value call store and to retrieve call retrieve function. Derive two classes stack and queue from it and override store and retrieve.
6. Write a program to define the function template for calculating the square of given numbers with different data types.
7. Write a program to demonstrate the use of special functions, constructor and destructor in the class template. The program is used to find the bigger of two entered numbers.
8. Write a program to perform the deletion of white spaces such as horizontal tab, vertical tab, space ,line feed ,new line and carriage return from a text file and store the contents of the file without the white spaces on another file.
9. Write a program to read the class object of student info such as name , age ,sex ,height and weight from the keyboard and to store them on a specified file using read() and write() functions. Again the same file is opened for reading and displaying the contents of the file on the screen.
10. Write a program to raise an exception if any attempt is made to refer to an element whose index is beyond the array size.

MDD154 : Physics Lab – II

	L	T	C
	0	4	2

1. To determine the e/m ratio of an electron by J.J. Thomson method.

2. To measure the frequency of a sine-wave voltage obtained from signal generator and to obtain lissajous pattern on the CRO screen by feeding two sine wave signals from two signal generators.
3. To determine the frequency of A.C. mains by using Sonometer .

4. To determine the frequency of electrically maintained tuning fork by Melde's method.
5. Computer simulation (simple application of Monte Carlo): Brownian motion, charging & discharging of a capacitor.
6. To study the charging and discharging of a capacitor and to find out the time constant.

7. To study the Hall effect.

8. To verify Stefan's law.

9. To determine the energy band gap of a semiconductor by four probe method/or by measuring the variation of reverse saturation current with temperature.
10. To study the I-V characteristics of Zener diode.

11. To find the thermal conductivity of a poor conductor by Lee's disk method.

12. To study the thermo emf using thermocouple and resistance using Pt. Resistance thermometer.

Text Books:

1. Arora, C. L. " Practical Physics". S. Chand, 1995.

Note: Any 8-10 experiments may be chosen out of the list given above. Proper error – analysis must

be carried out with all the experiments.