

DAYANANDA SAGAR UNIVERSITY
SCHOOL OF COMPUTER APPLICATIONS
SCHEME OF TEACHING AND EXAMINATION 2016 – 2017

SEMESTER II

BRANCH: BCA

Sl. No.	Course Code	Course	CR/AU	No. of hours of Teaching				Scheme of Evaluation	
				Lecture	Tutorial	Lab/ Practice	No. of Credits	Continuous	Examination
1	16CA106	Mathematics-2	CR	02	02	02	04	40	60
2	16CA107	Principles of Programming	CR	04	--	--	04	40	60
3	16CA108	Data Structures	CR	04	--	--	04	40	60
4	16CA109	Computer Organization II	CR	04	--	--	04	40	60
5	15EN102	Technical Communications	CR	02	--	02	03	40	60
6	16CA173	Programming Lab	CR	-	-	04	02	40	60
7	16CA174	Data Structures Lab	CR	-	-	04	02	40	60
8	16CA175	Computer Organization Lab	CR	-	-	04	02	40	60
GRAND Total : 800				16	02	16	25	320	480
9	16CA192	Environment and Public Health	AU	02	--	--	02	25	50

Continuous evaluation: 2 IA Tests =20 marks, Assignment = 10 marks, Self-study presentation / survey reports / quiz / programming exercises / presentation in seminar and workshops = 10 marks

Syllabus 2nd Semester Courses

Course Code: 16CA201	MATHS II	L	T	P	C
		02	02	02	04
Course Objectives	To acquaint students with various Statistical methods, to develop skills pertaining to Data analysis, Modelling and Research design.				
Course outcomes	The students will i) understand various statistical techniques that can be applied to real life situations. ii) study and appreciate discrete probability and it's uses iii) understand and will be able to use operations research techniques to the given optimization problems				
Module 1	BASICS OF STATISTICS Measures of Central Tendency -Mean(AM,GM,HM), Mode, Median, Standard deviation, Variance; Correlation - Bivariate data, bivariate frequency distribution. Concept of correlation between two variables, Types of correlation, Karl Pearson's coefficient of correlation (r), Spearman's rank correlation coefficient, Curve Fitting; Regression - Concept of regression, lines of regression, fitting of lines of regression by the least squares method, Regression coefficient.				06 hrs
Module 2	DISCRETE PROBABILITY AND PROBABILITY DISTRIBUTIONS Events, Conditional Probability and Independence, Univariate Probability Distributions, Bivariate Probability Distribution, Mathematical Expectation. Bivariate distribution, conditional and marginal distributions - Discrete distributions, discrete uniform, Binomial poison and geometric Distributions, Continuous distributions - Uniform, Normal, Exponential and Gamma distributions.				06 hrs
Module 3	STATISTICAL INFERENCE Test of significance- Elements of Hypothesis Testing : Null and Alternative hypotheses, Simple and Composite hypotheses, Critical Region, Type I and Type II Errors, Level of Significance and Size., Analysis of Variance (ANOVA) - Introduction: Heterogeneity and Analysis of Variance and Covariance,				06 hrs
Module 4	STATISTICAL INFERENCE Linear Hypothesis, Orthogonal splitting of total variation, Selection of Valid Error. Applications of the ANOVA technique to: one-way classified data, two-way classified Data, Time Series Analysis - Introduction: Examples of time series from various fields, Components of a times series, Additive and Multiplicative models. Trend and Seasonal Components: Estimation of trend by linear filtering (simple and weighted moving averages).				06 hrs
Module 5	OPERATIONS RESEARCH Linear Programming - Meaning and scope of OR. Definition of general LPP, Formulation of LPP, Solution of LPP by graphical method, Simplex algorithm, Transportation, Assignment and Sequencing Problems; Project management -CPM, PERT.				06 hrs

Text Books	<ol style="list-style-type: none"> 1. Goon A.M., Gupta M.K. & Dasgupta B: Fundamentals of Statistics, Vol. 1, The World Press Pvt. Ltd., Kolkata. 2. Gupta and Kapoor : Fundamentals of Mathematical Statistics, Sultan 3. Chand and Sons, New Delhi. 4. Taha : Operations Research: An Introduction : Mac Millan.
Reference Books	<ol style="list-style-type: none"> 1. Doughlas, C., Montgomery, Lynwood, A. & Johnson, 1976, Forecasting and Time Series Analysis, Tata McGraw-Hill, New Delhi. 2. Chung K.L. (1983): Elementary Probability Theory with Stochastic Process, Springer / Narosa 3. Feller W. (1968): An Introduction to Probability Theory & its Applications, John Wiley 4. Rohatgi V.K. (1984): An Introduction to Probability Theory & Math. Statistics, John Wiley 5. Kendall M.G. (1976): Time Series, Charles Griffin. 6. Kossack, C.F. and Hensschkec, C.I., Introduction to Statistics and Computer Programming, Tata McGraw-Hill, New Delhi. 7. Hoel, P. G. : Introduction to Mathematical Statistics (1962), John Wiley and Sons, New York. 8. KantiSwarup P.K. Gupta and ManMohan: Operations Research. Sultan Chand. 9. Wayne L. Winston: Operations Research. Thomson, India edition. 4th edition.

Course code: 16CA202	ADVANCE PROGRAMMING CONCEPTS	L	T	P	C
		03	02	04	06
Course Objectives	This subject covers the basics of OOPS concepts such as Inheritance, Polymorphism, Event driven programming, Exceptions and Concurrent programming.				
Course outcomes	The students will i) understand OOP concepts, programming blocks. Packages and interfaces. ii) understand and use the exception handling and design programs with multithreading.				

Module 1	Basics of Object Oriented Programming (OOP) Need for OO paradigm, Classes and objects, Constructors and Destructors, Access control, Inheritance, Abstraction, Encapsulation, Polymorphism, Overriding, String handling.	9 Hour
Module 2	Programming blocks Data types , variables, Identifiers, Key words, scope and life time of variables, operators, expressions, control statements, type conversion and casting.	9 Hour
Module 3	Packages and Interfaces Defining, Creating and Accessing a Package, importing packages, Interfaces, abstract Classes, implementing interface, variables in interface, extending interfaces.	9 Hour
Module 4	Exception handling Concepts of exception handling, benefits of exception handling, Termination or presumptive models, exception hierarchy, built in exceptions, creating own exception sub classes.	9 Hour
Module 5	Multithreading : Thread life cycle, creating threads, synchronizing threads, daemon threads, and thread groups.	09 Hour
Text Books	1. Java: How to Program, 8/e, Dietal, Dietal, PHI 2. The C++ Programming Language , Bjarne Stroustrup 3. Java: The complete reference, 7/e, Herbert Schildt, TMH.	
Reference Books		

Course Code: 16CA203	DATA STRUCTURES	L	T	P	C
		3	2	4	6
Course objectives	The objective of the subject is to teach the student the usage of data structures using any Programming language.				
Course outcomes	At the end of the course student will be able 1. To understand and explain linear and dynamic allocation of memory using array and linked list 2. To design programs for queue, stacks, sorting, Searching using linear data structures. 3. To use Nonlinear data structures to create Tree, Graphs.				

Module 1	Searching Techniques Preliminaries of algorithm, Algorithm analysis and complexity. Recursion: Definition, Design Methodology and Implementation of recursive algorithms, Linear and binary recursion, recursive algorithms for factorial function, GCD computation, Fibonacci sequence, Towers of Hanoi, Tail recursion List Searches using Linear Search, Binary Search, Fibonacci Search.	10 Hour
Module 2	Sorting Techniques Basic concepts, Sorting by : insertion (Insertion sort), selection (heap sort), exchange (bubble sort, quick sort), distribution (radix sort) and merging (merge sort) Algorithms.	10 Hour
Module 3	Stacks and Queues Basic Stack Operations, Representation of a Stack using Arrays, Stack Applications: Reversing list, Factorial Calculation, In-fix- to postfix Transformation, Evaluating Arithmetic Expressions. Queues: Basic Queues Operations, Representation of a Queue using array, Implementation of Queue Operations using Stack, Applications of Queues-Round robin Algorithm, Enqueue, Dequeue, Circular Queues, Priority Queues.	10 Hour
Module 4	Linked Lists Introduction, single linked list, representation of a linked list in memory, Operations on a single linked list, merging two single linked lists into one list, Reversing a single linked list, applications of single linked list to represent polynomial expressions and sparse matrix manipulation, Advantages and disadvantages of single linked list, Circular linked list, Double linked list	10 Hour
Module 5	Trees and advance Data Structures Basic tree concepts, Binary Trees: Properties, Representation of Binary Trees using arrays and linked lists, operations on a Binary tree , Binary Tree Traversals (recursive), Creation of binary tree from in-order and pre (post) order traversals. Adv Data Structures	10 Hour
Text Books	1. Data Structures, 2/e, Richard F, Gilberg , Forouzan, Cengage 2. Data Structures and Algorithms, 2008,G.A.V.Pai, TMH	
Reference Books	1. Data Structure with C, Seymour Lipschutz, TMH 2. Fundamentals of Data Structure in C, 2/e, Horowitz, Sahni, Anderson Freed, University Press	

Course code: 16CA204	COMPUTER ORGNIZATION- II	L	T	P	C
		3	02	04	6
Course Objectives	This course aims to equip the student with assembly level programming using 8086 microprocessor.				
Course outcomes	At the end of the course student will be able 1. to understand the design the data part and control part of a processor 2. to understand memory technology, I/O systems and I/O operation and use them in the design of a computing system 3.To understand and appreciate the 8086 processor and program the same to solve problems.				

Module 1	Introduction to the microprocessor and computer: Internal processor architecture, Functional block diagram, Bus, Clock signals, addressing modes.	10 hrs
Module 2	Programming 8086: Data movement instructions, Arithmetic and logic instructions, Program control instructions, string instructions, programming techniques, examples. Modular programming: stacks, subroutines, Macros.	10 hrs
Module 3	Assembler Directives: Data Definition and Storage Allocation, Program Organization, Alignment, Program End, Value Returning Attribute, Procedure Definition, Macro Definition, Data Control, Branch Displacement, Header File, Inclusion, Target Machine Code, Generation Control Directives.	10 hrs
Module 4	Interrupts and interrupt routines, I\O interface and programming: Fundamental I\O considerations, Data transfer schemes9Programmed I\O, Interrupt I\O, DMA, System bus structure, Min.Max Modes, Application of 8259, 8255,8251,8257,8253	10 hrs
Module 5	Introduction to other 16 bit 32 bit processors: 80286, 386, 486, Pentium and Pentium Pro-processor.	10 hrs
Text Books	1. Yu9Chang Liu & Glenn A Gibson, "Microcomputer systems: the 8086\8088 Family: Architecture, Programming and design", PHI 2. Microprocessor 8086 : Architecture, Programming and Interfacing : Mathur Sunil, PHI Learning	
Reference Books	1. Douglas V. Hall- Microprocessors and digital systems, MH. 2. Kenneth L. Short - Microprocessor and Programmed Logic ", PHI, 2nd Edition. 3. Aditya P. Mathur- Introduction to Microprocessors, 3RD Edn. TMH 4. Antonakos: Introduction to Intel family of Microprocessors Pearson Education 5. Hoffer: Modern Systems Analysis and Design Pearson Education Kendall, System Analysis and Design	

Course code: 16EN102	English	L	T	P	C
		02	--	02	03
Course Objectives	To teach the elements of effective writing and communicative methods				
Course outcomes	1. The student will be able to communicate effectively orally and in written 1. Draft technical reports and proceedings.				

Module 1	Preparation of Abstract, Synopsis Notices	06 hrs
Module 2	Technical Paper writing, Minutes of the meeting	06 hrs
Module 3	Letter Writing(Letters of enquiry, Permission, Regret, Reconciliation, Complaint, Breaking the ice.)	06 hrs
Module 4	Drafting Curriculum Vitae, Resume and Covering Letters. Job Applications	06 hrs
Module 5	Memo, E-mail Etiquette.	06 hrs
Text Books	1. N. Krishnaswamy and T. Sri Raman, Creative English for communication, Macmillan Publication- 2005. 2. Meenakshi Raman &Sangeeta Sharma, Technical Communication – Principles and Practice, oxford University press	
Reference Books	1. N. Krishnaswamy and T. Sriraman, Creative English for Communication Business Communication and Report Writing, Macmillan.	