UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of the Course: Business Systems & Applications
Course Code: BCA101
L-T Scheme: 3-1 **Course Credits: 4**

Introduction: Business system application, especially e-business systems, use computer and web-based technology to deliver existing business models or promote new ones. This module examines existing business systems, applications and environments, as well as emerging ones that support these business models and system management. The primary focus is on the various business systems, applications and management and understanding how an enterprise framework and integration of disparate application environments facilitate functioning of business and enable development of new models.

Objectives: The objective of this course is to develop in students an understanding of the concepts, skills and techniques required to become an effective systems analyst who will work with others to create information systems for businesses

Course Outcomes:

On successful completion of this module, students should be able to:

1. Fully understand how e-business systems can contribute to broader enterprise management issues

2. Comprehensively evaluate and critically analyze various business systems (including e-business systems), applications and management

3. Compare and evaluate alternative business application environments that enable business systems

4. Demonstrate a good understanding of architectural options for implementing and facilitating business systems and management

5. Research and evaluate interdependencies between business systems and the rest of the enterprise management environment

6. Critically analyze the impact of business systems and applications on enterprise performance and development of society.

7. Demonstrate interpersonal skills and the ability to work effectively with others to achieve common goals.

Course Contents:

UNIT-1: Use of computers for managerial applications, Technology issues and data processing in organisations, Introduction to Information Systems, shift in Information system thinking, latest trends in Information Technology.

UNIT-2: Computer Based Information Systems- office automation systems. Decision making and MIS, transaction processing systems.

UNIT-3: Decision support system, Group Decision Support, Executive Information systems, DSS generator.

UNIT-4: Introduction to: Artificial Intelligence Based Systems, End user computing, Distributed data processing.

UNIT-5: Deciding on IS architecture, IT leadership & IS strategic planning.

UNIT-6: Introduction to: IS strategy and effects of IT on competition.

UNIT-7: Introduction to: ERP, re-engineering work processes for IT applications, Business Process Redesign.

UNIT-8:Knowledge engineering and data warehouse.

Books:

1.Management Information System, O'Brien, TMH
2. Management Information System: A Concise Study,Kelkar,PHI

3.Decision support Systems, Janaki Raman, PHI

4 Business Information Systems, Munish Kumar, VIKAS

5.Business Application of Computers, M.M. Oka, EPH

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Digital Electronic
Course Code: BCA102
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

This course examines about Digital Electronics circuit. The Topics to be covered (tentatively) include:

- Data and Number System
- Boolean algebra
- Combinational Circuit
- Sequential Circuit
- A/D converter and D/A converter
- Memory system

Objectives:

1. To acquire knowledge on basics of digital circuits and its applications.
2. This course deals with the basics of Boolean algebra, Digital principles and circuits.
3. The course starts with the basics of Boolean algebra and Boolean expression minimization techniques. Then it explains simple combinational networks like Multiplexers, decoders etc.
4. Sequential and combinational digital circuits are the building blocks of
5. any processor, irrespective of its application.
6. After this the difference between the combinational technologies and sequential circuits is dealt with. Finally, it gives the method to realize the basic gates using different technologies.

Learning Outcomes:

Once the student has successfully completed this course, he/she will be able to answer the following questions or perform following activities:

1. Able to explain the basic concepts of digital electronics circuits
2. Able to describe different types of logics, complexity, circuit specifications.
3. On successful completion of this Course, the students would be able to minimize functions using any type of minimizing algorithms (Boolean algebra, Karnaugh map).
4. Define the problem (Inputs and Outputs), write its functions. Implement functions using digital circuit (Combinational or Sequential) and knowledge in analyzing and designing procedures of Combinational and Sequential circuits.
5. To be able to differentiate electronic from electrical systems and identify the basic blocks in any electronic system

Course Contents:

1. Data and number systems; Binary, Octal and Hexadecimal representation and their conversions; BCD, ASCII, EBDIC, Gray codes and their conversions; Signed binary number representation with 1's and 2's complement methods, Binary arithmetic [5]

2. Venn diagram, Boolean algebra; Various Logic gates- their truth tables and circuits; Representation in SOP and POS forms; Minimization of logic expressions by algebraic method, K-map method [6]

3. Combinational circuits- Adder and Subtractor circuits; Applications and circuits of Encoder, Decoder, Comparator, Multiplexer, De-Multiplexer and Parity Generator. [8]

4. Memory Systems: RAM, ROM, EPROM, EEROM; Design of combinational circuit using ROM, Programming logic devices and gate arrays. (PLAs and PLDs) [5]

5. Sequential Circuits- Basic memory element-S-R, J-K, D and T Flip Flops, various types of Registers and counters and their design, Irregular counter, State table and state transition diagram, sequential circuits design methodology.[9]

6. Different types of A/D and D/A conversion techniques; Logic families- TTL, ECL, MOS and CMOS, their operation and specifications. [6]

Text Books

1. A.Anand Kumar, Fundamentals of Digital Circuits- PHI
2. A.K.Maini- Digital Electronics- Wiley-India
3. Kharate- Digital Electronics- Oxford

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: PC SOFTWARE
Course Code: BCA103
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

This course examines operating system design concepts, internet technologies, and software and hardware basics. The Topics to be covered (tentatively) include:

- Computer and operating system structures
- Process and working of computer
- Software
- Hardware
- Memory
- File system and management
- I/O devices management
- Selected examples in networking, protection and security

Objectives:

This course in Computer Science for the BCA students; therefore, it deals with the basic concepts of computers. It discusses about the computer hardware, its components and basic computer architecture. The course also deals with the basic computer software including the operating system and its concepts. This course also highlights some of the open source software technologies. Finally the course highlights the applications of computers that include web applications, social networking and wiki.

Learning Outcomes:

Knowledge:

1. Understand the theory and logic behind the design and construction of operating systems.
2. You will differentiate between various operating systems functionalities in terms of performance.
3. Become aware of the issues in the management of resources like processor, memory and input-output.
4. Know the problems in the design of operating system and study the probable solutions.
5. Learn File systems and methods of accessing
6. Understanding various security

Application:

1. To implement, Microsoft Office Application

Course Contents:

MODULE 1: Basics of Computer Hardware

Unit 1: Computer their Origin and Applications A bit of history highlighting the concepts, Abacas, Difference Engine, Electro-magnetic Computers, Discrete components, IC circuits, Current hardware Platforms, Description of current applications of computer highlighting role of computers, Limitations of Computers

Unit 2 : Functioning of a Computer Components of a computer and their role, Number system, Codes ASCII Unicode Concept of Instruction – a simple example, Role of ALU and CU with the help of an example

Unit 3: Memory System Type of memories and their characteristics, what is the need of memory hierarchy? Memory Hierarchy with examples of each level, Current trends in memory

Unit 4: I/O devices and their functions I/O devices, Current trends in I/O

Course Description

Unit 5: My Personal Computer Explain the configuration of PC and its components in respect of identification of various components so that a student can relate all the terms discussed in Unit 1 to 4 to this configuration.

MODULE 2: Basics of Computer Software

Unit 1: Software Evolution Different type of software and its evolution, System and application software, Utility software, perverse software, Open Source software

Unit 2: Operating System Concepts Need and Functions, Type of OS starting from Batch, Multi-programming and real time Network and distributed OS, Web OS, Examples of OS and their features

Unit 3: Concept of Programming Languages Some basic constructs, Editors, Compilers and interpreters, Assemblers 17

Unit 4: Computer Applications Concepts of Open Source Software, Philosophy – licensing, copyright Project Management Software, Timesheet system, Office Applications, Word Processing – Creating a Memo for a number of people, Spreadsheet – Creating a sheet of Income & deduction and calculation of IT Database – a small application with data records, a form, a query and a report Email – Sending mail to a number of people in a group.

MODULE 3: Internet Technologies

Unit 1: Networking and Internet Basic of Networking Concepts, Advantages of Networking, Basic model of Networks, Network Devices, TCP/IP, Web addresses, DNS, IP addresses

Unit 2: Web Applications I Browsing, E-mail, Messenger/Chat

Unit 3: Web Applications II Blogging, E-Learning and wiki, Collaboration, Social Networking

Text Books

1. Ramesh Bangia, “PC Software Made Easy (SIXTEEN-IN-ONE)”, Khanna Publishing.

References

1. Sinha P K, Computer Fundamentals, Bpb Publications-New Delhi.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Introduction to Programming
Course Code: BCA104
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

Computers are so widely used in our day-to-day lives that imagining a life without them has become almost impossible. Learning computer fundamentals is a stepping stone to having an insight into how these machines work. Once the student is aware of the basic terminology that is commonly used in computer science, he/she can then go on to develop useful computer programs that may help solve a user's problem. Since computers cannot understand human languages, special programming languages are designed for this purpose. C is one such programming language. Being the most popular programming language, it is used in several different software platforms such as system software and application software. A few other programming languages such as C++ and JAVA are also based on C. Hence, mastering the C is prerequisite to become a successful computer engineer.

Objectives:
1. Learn how to solve common types of computing problems.
2. Learn data types and control structures of C
3. Learn to map problems to programming features of C.
4. Learn to write good portable C programs

Learning Outcomes:
Upon successful completion of the course, a student will be able to:
1. Appreciate and understand the working of a digital computer
2. Analyze a given problem and develop an algorithm to solve the problem
3. Improve upon a solution to a problem
4. Use the 'C' language constructs in the right way
5. Design, develop and test programs written in 'C'

Course Contents:
Unit 1: Introduction to Computers – Generations, Classifications, Applications, Basic Organization. Input and output devices. Basic concept of Computer memory, Computer software and networks.

Unit 2: Number system – Decimal, Binary, Octal, Hexa-decimal. Conversion of numbers, Addition and subtraction of two numbers. Two's compliment, Multiplication and division of binary numbers. Working with fractions, signed number representation in binary form, Logic gates.

Unit 3: Introduction to C – compiling and executing C programs, using comments, keywords, identifiers, Data type, variables, constants, input/output statements in C, operators in C, type conversion and type casting.

Unit 4: Decision Control and looping statements – conditional branching statement, iterative statements, nested loops, break and continue statements, goto statement.

Unit 5: Arrays – Declaration, accessing elements of array, storing values, calculating the length of array, two dimensional arrays. Strings – reading and writing strings, suppressing input, string taxonomy, string operations – using and without using library function, array of strings.

Unit 6: Functions – Declaration, prototype, definition, function call, return statement, passing parameters to the function, scope of variable, storage classes, recursive functions.

Unit 7: Pointers – introduction, declaration, Pointer expression and arithmetic, null pointer, generic pointer, passing arguments to functions using pointer, pointers and arrays, passing an array to function, difference between array name and pointer, pointers and strings, array of pointers, function pointers, pointers to pointers, dynamic memory allocation, drawbacks of pointers.

Unit 8: Structure, nested structure, array of structure, union, array of union variable, unions inside structure. Files – Reading –writing etc. Preprocessor directives.

Text Books

1. Brian Kernighan and Dennis Ritchie, The C Programming Language, 2nd Edition, Prentice Hall PTR, 1988.
2. Reema Thareja, Computer fundamentals and Programming in C, oxford university press, 2012.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Mathematics
Course Code: BCA105
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

The goal of this mathematics course is to provide high school students and college freshmen an introduction to basic mathematics and especially show how mathematics is applied to solve fundamental engineering problems. The Topics to be covered (tentatively) include:

Matrix
Calculus
Algebra
Dimensional geometry

Course Objectives:

The objective of this course is to introduce the basic principles and techniques of Calculus and its engineering applications. It lays the required foundation and skills that can be repeatedly employed in subsequent courses at higher levels. Students will acquire the skills and techniques of:

1. Applying matrix in engineering problems.
2. Change of variables using Jacobians.
3. Computing an average value of a function using mean value theorems and their applications to engineering problems.

Learning Outcomes:

Knowledge:

1. Solve systems of linear equations using matrix transformations and interpret the nature of solutions.
2. At the end of second unit student will be able to differentiate function of more than one variable.
3. After the completion of the third unit, student will be able to trace, find the length of a given curve by studying its characteristics.
4. At the end of this course the student should be able to apply the above-mentioned concepts to engineering problems.

Application:

1. Matrices can be used to solve physical related applications and one applied in the study of electrical circuits, quantum mechanics and optics, with the help of matrices, calculation of battery power outputs, resistor conversion of electrical energy into another useful energy can be done.
2. Partial differential equations are used in wave and heat equations.
3. Algebra can be applied to solve various real life engineering problems.

Course Contents:

Unit 1:Algebra: Sets,Union, intersection,complement,mapping,notionofgroup, ring,fieldwithsimple examples;Polynomials,divisionalgorithm, fundamental theoremofclassical algebra(withoutproof),Descartesrule ofsignandtheir application,relationbetweenrootsandcoefficients, symmetricfunctionof roots,transformationofpolynomialequations,Cardan'ssolution of cubicequation.

Unit 2: Matrices,additionandmultiplicationofmatrices, inversematrix,solution oflinearequationsinthreevariablesby Cramer'srule,solutionof three line linear equationsbymatrix inversionmethod.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Unit 3: Differential calculus:Limitsoffunctionand continuity,fundamental propertiesofcontinuous

functions (without proof),geometricmeaningof derivative anddifferential,rulesofdifferentiation,successive differentiation,Rolle'stheorem,meanvaluetheorem,Taylor'sandMaclaurin'stheoremswithCauchy'sandLagrange'sformsofreminder,Taylor'sseries,functionofseveralvariables,partial derivatives,total differential, Euler's theoremonhomogeneousfunctionsof two variables.
Integralcalculus:Rulesofintegrationofindefiniteintegrals,solutionof definiteintegralsandtheirelementary properties,ideaofimproper integrals.

Unit 4: Dimensional geometry: Transformationofrectangular axes,invariants,general equationofsecond degree –reduction tostandardformsand classification,planepolar equationofastraightline,circleand conic.

Text Books

1. Engineering Mathematics-I (B.K Pal and K.Das) [Chapter 1 and chapter 3].
2. Engineering Mathematics, Vol:1&Vol:2,Sastry,PHI [All course]

Reference Books

1. UniversityAlgebrathrough 600 SolvedProblems,N.S.Gopalakrishnan, New AgeInternational.
2. Higher Engineering Mathematics, Vol.2,Rathore, EPH

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: PC Software Lab
Course Code: BCA194
L-T-P scheme: 0-0-3 **Course Credit: 2**

Objectives:
The main objectives of PC Software Lab course are to familiarize with basic operations of:
1. Operating systems such as Windows and Linux.
2. Word Processor such as Open Office and MSWord.
3. Workbook, worksheet, graphics and Spreadsheets.
4. PowerPoint including animation and sounds.
5. Address book, Spam and Filtering in E-mail.
6. Browsing, Search, Discussion forum and Wiki's.

Learning Outcomes: The students will have a detailed knowledge of the concepts of process and memory, learn the basics behind file systems and input output systems and understand the fundamentals of network and operating systems. Upon the completion of Operating Systems practical course, the student will be able to:

- **Understand** and implement basic services and functionalities of the operating system using system calls.
- **Use** modern operating system calls and synchronization libraries in software/ hardware interfaces**.**
- **Understand** the benefits of thread over process and implement synchronized programs using multithreading concepts.

Course Contents:
Exercises that must be done in this course are listed below:

Section 1 : Operating System
- Session 1: Familiarization (Keyboard, Memory, I/O Port),
- Session 2: Windows (2 Session)
- Session 3: Linux (2 Session)

Section 2: Word Processor (Open Office and MS Word)
- Session 1: Basic Operations (Font selection, Justification, Spell check, Table, Indentation),
- Session 2: Table of Contents, Track Changes and Commenting.
- Session 3: Mail Merge, Printing, Practice session.

Section 3 : Spread sheet (Concept of Worksheet, Workbook and cell)
- Session 1 : Data entry, Data editing and Formula
- Session 2 : Functioning
- Session 3 : Graphics and Practice session

Section 4 : PowerPoint
- Session 1 : Basics operation
- Session 2 : Animation and Sounds

Section 5 : E-mail
- Session 1 : Basic Operation,
- Session 2: Address Book, Spam and Filtering

Section 6 : Browsing and Discussion Forum
- Session 1 : Browsing and Search (2 Sessions)
- Session 2 : Discussion Forum, Wiki and Google Doc (3 Sessions)

Text Book:
1. Ramesh Bangia, "PC Software Made Easy (SIXTEEN-IN-ONE)", Khanna Publishing.
2. Sinha P K, Computer Fundamentals, Bpb Publications-New Delhi.

Recommended Systems/Software Requirements:
1. Microsoft Office 2007, 2010.
2. Windows XP or Linux Operating System.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Basic Programming Lab(C/Pascal)
Course Code: BCA193
L-T-P scheme: 0-0-3 **Course Credit: 2**

Introduction:
This course is designed to familiarize students with the basic components of a computer, so as to be able to operate it and be able to interact with it, and carry out simple tasks. In addition, it will initiate the students into the discipline of Programming. It aims to start off the development of problem solving ability using computer programming. This course teaches not only the mechanics of programming, but also how to create programs that are easy to read, maintain, and debug. Students are introduced to the design principles for writing good programs regardless of the hardware and the software platforms.

Objective:
Students will develop their ability to design, develop, test and document structured programs in C language.

Learning Outcomes: Students should be able to
1. Understand the basic terminology used in computer programming
2. Write, compile and debug programs in C language.
3. Use different data types in a computer program.
4. Design programs involving decision structures, loops and functions.
5. Explain the difference between call by value and call by reference
6. Understand the dynamics of memory by the use of pointers.
7. Enhance programming skills through problem solving and code development of small-size software applications.
8. Improve self-learning, teamwork and communication skills through project development practices.
9. Engage in continuing professional development under minimal guidance.

Course Contents:
Exercises that must be done in this course are listed below:
1 Introduction to C programming
2 Structured Program Development in C
3 Flowchart and Algorithm
4 C Program Control
5 C Functions
6 C Arrays
7 C Pointers
8 C Characters and Strings
9 C Structures, Unions, Bit Manipulations and Enumerations

References
1. Yale N. Patt and Sanjay J. Patel, Introduction to Computing Systems, from bits & gates to C & beyond, 2nd Edition, 2004.
2. Deitel and Deitel, C How to Program, 7th Edition, 2013.
3. Venugopal Prasad, Mastering C, Tata McGraw Hill.
4. Complete Reference with C, Tata McGraw Hill.
5. Drmey, How to solve it by Computer, PHI.
6. Kerninghan and Ritchie, The C Programming Language.