UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Course Description

Title of Course: Computer Architecture & Systems Software
Course Code: BCA201
L-T-P Scheme: 3-1   **Course Credits:4**

Introduction: The processor is truly the computer --- it is wired to compute arithmetic and related operations on numbers that it can hold in its data registers. A processor is also called a Central Processing Unit (CPU).

- Basic Computer Architecture
- Computer Organization
- Instruction Set Architecture
- Memory Management

Objective:

To learn the fundamental aspects of computer architecture design. The course focuses on processor design, pipelining, superscalar, out-of-order execution, caches (memory hierarchies), virtual memory, storage systems, and simulation technique.

Learning Outcomes:
Knowledge:

1) Basic Computer system architecture

2) Know about computer performance, instruction set architecture design and implementation

3) Know about uni-processor implementation alternatives (single- cycle, multiple-cycle, and pipelined implementations)

Application:

1) Implement Pipeline
2) Implementation of computer systems
3) Micro-architecture design
4) Instruction set architecture design

Course Contents:

Unit –I: Introduction to Computer Architecture

Microprocessors (8085 features), Bus structure, Data representation, Register transfer and Central processing unit.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Course Description

Unit –II: Parallel Processing

Basic concepts, instruction and arithmetic pipeline, Array processing, Vector processing.

Unit –III: Memory Management

Memory organization, CPU architecture, Instruction format, addressing mode, stacks and handling of interrupts

Unit –IV: CPU Organization

Computer arithmetic, Input-output organization, Basic computer organization and design, Programming the computer with assembly language (same basic applications),

Unit –V: System Software

micro-operations, Micro-programmed control, Firewall, Anti-virus.

Text Book

1. M.Morris Mano, "Computer System Architecture", PEARSON

2. John L. Hennessy and David A. Patterson, "Computer Architecture A Quantitative Approach" , MK Publisher.

References

1. C. Hamacher, Z.Vranesic, "Computer Organization", McGraw-Hill
2. William Stallings, "Computer Organization & Architecture", PEARSON

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Course Description

Title of Course: Information System Analysis & Design
Course Code: BCA202
L-T Scheme: 3-1   **Course Credits: 3**

Introduction:
The objectives of the course include the enabling of learner to identify the Software projects in an organization after studying various functionalities in the organization. The course covers requirements analysis and design techniques for information systems. Requirements analysis consists of two phases: a feasibility study and a requirements specification phase. For design, the topics covered include architectural design, database design, and user interface design.

Objectives:
The objectives of the course include the enabling of learner to identify the Software projects in an organization after studying various functionalities in the organization. Also, they should be able to structure various requirements, do the design and select the best method to develop the system. They should be able to implement and maintain the system. The learners should also get acquainted with different quality standards as well as learn about Management Information Systems.

Learning Outcomes:
Knowledge:
1. Different type of methodologies, analysis and design techniques.
2. Understand the information systems, feasibility study and a requirements specification phase.
3. Architectural design, database design, and user interface design.
4. Database design, user interface design.
5. Development technique, decision making for system.
6. Testing technique like unit, integration.

Application:
1. To develop, implement methodologies.
2. To develop, implement architectural design.

Course Contents:
Unit 1: **Overview of System analysis and design**
Introduction to System analysis and design. Development life cycle. Requirements determination, Logical design, Physical design, Program design. Risk and feasibility analysis, prototyping.

Unit 2: Information requirement analysis
Process modeling with physical and logical data flow diagrams. Data modeling with entity relationship diagrams. Normalization up to 3NF.

Unit 3: System design
Process descriptions, Input/output controls, Object modeling, Database design, User Interface design, Documentation, Data Dictionary.

Unit 4: Development methodologies
Top down, bottom up, structured chart, Decision table, decision tree, CASE productivity tools.

Unit 5: Testing
Unit, integration testing, System, Acceptance testing, decision tree

Unit 6: Case studies

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Course Description

Test Case generation Case studies, Use of CASE tools by organizations, Definition of CASE Tools, Use of CASE tools by Organizations, Role of CASE Tools, Advantages of CASE Tools, Disadvantages of CASE Tools, Components of CASE, Types of CASE Tools, Classification of CASE Tools, Reverse and Forward Engineering, Visual and Emerging CASE tools, Traditional systems development and CASE based systems development, CASE environment, Emerging CASE Tools, Objected oriented CASE tools, Creating documentation and reports using CASE tools, Creating

Text Books

1. Elias M. Awad " System Analysis and Design" Galgotia Publications Pvt. Ltd.

2. System Analysis & Design, Parthasarathi, EPH

References

1. Information Systems: Analysis and Design,Ram Bansal 'Vigyacharya',New Age International
2. Analysis, Design & Implementation of Information System, Sharma, VIKAS

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Course Description

Title of Course: Computer Programming
Course Code: BCA203
L-T Scheme: 3-1   **Course Credits: 4**

Introduction:
   1. Learn basics of computer programming
   2. Learn how to solve a given problem
   3. Learn to use various paradigms of programming and user interface designing.
   4. Learn Visual Basic as a programming language
   5. Learn how to implement data structures and functions available in Visual Basic tosolve problems

Objectives:
   - Students will learn to evaluate engineering problems, formulate one or more solution techniques or algorithms, and code the solution using Microsoft Visual Basic for Applications (VBA) software and connect database with Microsoft Access.
   - Professionalism in completing and presenting laboratory exercises is emphasized.

Learning Outcomes:
Knowledge:
   - Student learns about Visual Basic's Integrated Development Environment (IDE).
   - Student write Visual Basic programs using object-oriented programming techniques including classes, objects, methods, instance variables, composition, and inheritance, and polymorphism.
   - Understand windows applications using forms, controls, and events.
   - Understand design, create, build, and debug Visual Basic applications.
   - Understand database design, connectivity with backend tool.
   - Create one and two dimensional arrays for sorting, calculating, and displaying of data.
   - Write and apply procedures, sub-procedures, and functions to create manageable code.
   - Write and apply decision structures for determining different operations.
   - Analyze a given problem and implement an algorithm to solve the problem.
   - Improve upon a solution to a problem.
   - Implement the Visual Basic language constructs in the right way.
   - Design, develop and test Applications written in Visual Basic.

Course Contents:
Unit 1: Introduction – Installing Visual Basic, First Application, Toolbox, Property Editor, VB Forms, buttons, Events, Adding Code, Dealing with Errors, Project Explorer, Saving and Reopening Applications.

Unit 2: Controls Explained – Controls and Methods, Using Buttons, Labels, Text Boxes, Picture Boxes, Check Boxes, Option Buttons, Frames, Lines and Shapes, Images, List Boxes, Flex Grids, Common Dialog Control, Combo Boxes, Timers, OLE Control, Setting Tab Order.

Unit 3: Basics – Variables and Scope, Data Types, Using If…Then…Else, For…Next, Do…Loop, Case…Else, With…End With, Input Box, API, Printing. VB Tools – Menus, Toolbars, Code Editor, ActiveX Controls, Reference Manager, Project Templates.

Unit 4: Introduction to Databases, Visual Data Manager, Designing Table, Adding Data, Adding Records, Deleting Records, Viewing Records, Searching Records, Showing Records in Grid, Copying Record to Clipboard.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Course Description

Unit 5: VB and Internet – Basics of Web Scripting.

Text Books
1. Greg Perry, SnajayaHettihewa, "SAMS Teach Yourself Visual Basic 6 in 24 Hours", Pearson Education.
2. Tim Anderson, "Visual Basic 6 in Easy Steps", Dreamtech Press.

References
1. Steven Holzner, "Visual Basic 6 Programming Black Book", Dreamtech Press.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Course Description

Title of Course: Mathematics
Course Code: M201
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:
Differential Equations
Series
Algebra

Course Objectives:
The objective of this course is to introduce the basic principles and techniques of Linear Algebra 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 applying differential Equations in engineering problems.

Learning Outcomes:
Knowledge:
1. Students explore the following topics: systems of linear equations, real vector spaces, linear transformations.
2. They are introduced to basic concepts of vector spaces, linear transformations and fundamental subspaces.
3. Convergence of the infinite series is taken into account.
4. Solving Differential Equations.

Application:
1. Demonstrate ability to work within vector spaces and to distill vector space properties.
2. Infinite series is used in harmonic analysis. Some differential equations cannot be solved using just one function, but can be approximated as an infinite series (of powers of x).
3. Understand the concepts of subspaces, linear span, linear independence, dimension and basis, linear transformation as a mapping from one vector space to another & calculate its matrixrepresentation with respect to standard & nonstandard bases.
4. Know how to calculate the rank of a matrix and be a master of the connection between the rank and the dimensions of the fundamental subspaces of a matrix.
5. The development of nonlinear analysis, dynamical systems and their applications to science and engineering has stimulated renewed enthusiasm for the theory of Ordinary Differential Equations (ODE).

Course Contents:

Unit   1:
Differentialequations:order,degree,solutionandformationofadifferentialequation,standardtechniquesofsol vingalineardifferential equation with constantcoefficients, Cauchy's andLagrange'slinear differentialequationswithvariablecoefficients.

Unit 2: Linear algebra: Vectorspace,subspaces, bases anddimensions,co-ordinates,linear transformation,algebraoflinear transformations, isomorphism, and representationof transformationby matrices.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Course Description

Unit 3: Sequence and series: Bounded and unbounded sequences, convergence or divergenceofa sequence,behaviorofmonotonesequences,algebraofconvergent sequences, Cauchy'ssequence, Cauchy'sgeneralprincipleofconvergence,infiniteseries– itsconvergenceandsum,serieswithpositivetermsandstandardtestsofconvergence(without proof),alternatingseries,Leibnitz test,absolute convergence,rearrangementofabsolutely convergentseries,testofconvergenceofAbeland Dirichlet(withoutproof).

Text Books
1. Engineering Mathematics-I (B.K Pal and K.Das) [Chapter 4]
2. Engineering Mathematics-II (B.K Pal and K.Das) [Chapter 1 and chapter 2]
3. Engineering Mathematics, Vol:1&Vol:2,Sastry,PHI [All course]

Reference Books
1.   Higher Engineering Mathematics,Vol.2,Rathore,EPH

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Course Description

Title of Course: English Language & Technical Communication-I
Course Code: HU201
L-T Scheme: 3-1   **Course Credits: 4**

Introduction:
This course can enhance the drafting and understanding skills of engineering students.
Objectives:
1. This Course has been designed to impart advanced skills of Technical Communication in English through Language Lab. Practice Sessions to 1ST Semester UG students of Engineering &Technology.
2. To enable them to communicate confidently and competently in English Language in all spheres.

Learning Outcomes:
Knowledge:
1. This course will help the students to learn English very easily. Even the Hindi medium students can translates easily.
2. The technical communication will help the students to improve their speaking skills and drafting skill for engineering students.

Course Contents:
Unit 1: ENGLISH LANGUAGE GRAMMAR-Correction of Errors in Sentences Building Vocabulary Word formation Single Word for a group of Words Fill in the blanks using correct Words Sentence Structures and Transformation Active &Passive Voice Direct &Indirect Narration (MCQ Practice during classes).

Unit 2: READING COMPREHENSION-Strategies for Reading Comprehension Practicing Technical & Non Technical Texts for Global/Local/Inferential/Referential comprehension; Précis Writing

Unit 3: TECHNICAL COMMUNICATION-the Theory of Communication–Definition & Scope Barriers of Communication Different Communication Models Effective Communication (Verbal/Nonverbal) Presentation / Public Speaking Skills (MCQ Practice during classes)

Unit 4: MASTERING TECHNICAL COMMUNICATION- Technical Report (formal drafting) Business Letter (formal drafting) Job Application (formal drafting) Organizational

Unit 5: GROUP DISCUSSION–Principle & Practice

Text Books
1. Board of Editors: Contemporary Communicative English for Technical Communication Pearson Longman, 2010
2. Technical Communication Principle sand Practice by Meenakshi Raman, Sangeeta Sharma (Oxford Higher Education)
3. Effective Technical Communication by Barun K. Mitra (Oxford Higher Education).
4. P C WREN & H.MARTIN (English language & grammar)

References
 1. D.Thakur: Syntax Bharati Bhawan, 1998
 2. Longman Dictionary of Contemporary English (New Edition) for Advanced Learners
 3. Internet

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR
Course Description

Title of Course: Programming Lab (Visual Basic)
Course Code: BCA293
L-T-P scheme: 0-0-3   **Course Credit: 2**

Objectives:
- Students will learn to evaluate engineering problems, formulate one or more solution techniques or algorithms, and code the solution using Microsoft Visual Basic for Applications (VBA) software and connect database with Microsoft Access.
- Professionalism in completing and presenting laboratory exercises is emphasized.

Learning Outcomes: Student learns about Visual Basic's Integrated Development Environment (IDE).
- Student write Visual Basic programs using object-oriented programming techniques including classes, objects, methods, instance variables, composition, and inheritance, and polymorphism.
- Understand windows applications using forms, controls, and events.
- Understand design, create, build, and debug Visual Basic applications.
- Understand database design, connectivity with backend tool.
- Create one and two dimensional arrays for sorting, calculating, and displaying of data.
- Write and apply procedures, sub-procedures, and functions to create manageable code.
- Write and apply decision structures for determining different operations.
- Analyze a given problem and implement an algorithm to solve the problem.
- Improve upon a solution to a problem.
- Implement the Visual Basic language constructs in the right way.
- Design, develop and test Applications written in Visual Basic.

Course Contents:
Exercises that must be done in this course are listed below:
i. Controls & Properties. Idea about Labels, Buttons, Text Boxes.
ii. Data basics, Different type variables & their use in VB,
iii. Sub-functions & Procedure details, Input box () & Msgbox ().
iv. Making decisions, looping
v. List boxes & Data lists, List Box control, Combo Boxes, data Arrays.
vi. Frames, buttons, check boxes, timer control,
vii. Programming with data, ODBC data base connectivity.
viii. Data forms Wizard, query, and menus in VB Applications,
ix. Graphics.

Text Book:
1. Greg Perry, Snajaya Hettihewa, "SAMS Teach Yourself Visual Basic 6 in 24 Hours", Pearson Education.
2. Tim Anderson, "Visual Basic 6 in Easy Steps", Dreamtech Press.

Recommended Systems/Software Requirements:
1. Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space.
2. Turbo C or TC3 complier in Windows XP or Linux Operating System.

Course Description

Title of Course: Business Presentation & Languages Lab
Course Code: HU291
L-T-P Scheme: 0-0-3   **Course Credits: 2**

Introduction:
This course teaches the students on the basic English communication within a workplace. It talks about the varied ways of communication in forms of Verbal, nonverbal and written.
   • Business communication
   • Verbal, Non-verbal Communication
   • Written Communication
   • Barriers of Communication
   • How to overcome barriers of communication
   • Report writing
   • Internal communication
   • External communication

Objectives:
The objective includes teaching students in the different forms of verbal and non-verbal communication and how to overcome barriers. This module further teaches how to carry on with different forms of internal and external communication within a workplace.

Learning Outcomes:
Knowledge:
1. Understand the theory and logic behind the forms of communication.
2. Analyzing the factors responsible for poor communication
3. Communication channels and how they help to improve
4. Become more efficient in terms of workplace communication
5. Handling different forms of written communication
6. Learn to use tools properly to execute work at workplace.
7. Reports, Memos and MOMs with their proper utilization.

Course Contents:
Unit 1Verbal Communication – Target group profile, Barriers of Communication, Listening, Feedback

Presentation Skills,Use of Aids, Public Speaking, Practice Presentation, Non Verbal Communication

Written Communication – Stages of Writing, Composing Business Messages, Preparing Notes, Style, Punctuation,

Using simple words, Proof Reading
Report Writing – Report Planning, Types of Reports, Developing an outline, Nature of Headings, Ordering of Points,

Logical Sequencing, Graphs, Charts, Executive Summary, List of Illustration

Unit 2Internal Communication – Circulars, Notices, Memos, Agenda and Minutes

External Communication – Resume/CV, Using Facsimiles (Fax), Electronic Main, Handling Mail
Writing Business Letters – Formats, Styles Types – Request, Enquiry, Placing Order, Instruction,

Action, Complaint, Adjustment, Sales, Reference, Good News & Bad News, Acknowledgement