

Course Title: **Microprocessor and Computer Architecture (3 Cr.)**

Course Code: **CACSI55**

Year/Semester: **I/II**

Class Load: **6 Hrs. / Week (Theory: 3 Hrs, Tutorial: 1 Hr., Practical: 2 Hrs.)**

Course Description

This course is an introduction to microprocessor and computer architecture. It covers topics in both the physical design of the computer (organization) and the logical design of the computer (architecture).

Course Objectives

The course has following specific objectives:

- To explain the microprocessor.
- To explain the assembly language programming.
- To explain the overview of computer organization.
- To explain the principle of CPU system.
- To explain the principle of memory system
- To explain the principle of data flow.

Course Contents

Unit 1 Fundamental of Microprocessor

5 Hrs.

Introduction to Microprocessors, Microprocessor systems with bus organization, Microprocessor architecture and operation, 8085 Microprocessor and its operation, 8085 instruction cycle, machine cycle, T states, Addressing modes in 8085, Introduction to 8086.

Unit 2 Introduction To Assembly Language Programming

10 Hrs.

Assembly Language Programming Basics, Classification of Instructions and Addressing Mode, 8085 Instruction Sets, Assembling, Executing and Debugging the Programs, Developing Counters and Time Delay Routines, Interfacing Concepts

Unit 3 Basic Computer Architecture

4 Hrs.

Introduction: History of computer architecture, Overview of computer organization, Memory Hierarchy and cache, Organization of hard disk.

Instruction Codes: Stored Program Organization-Indirect Address, Computer Registers, Common bus system, Instruction set, Timing and Control-Instruction Cycle

Unit 4 Microprogrammed Control

10 Hrs.

Basic Computer Design of Accumulator: Control of AC Register, ALU Organization; Control Memory-Address Sequencing; Conditional Branching, Mapping of Instruction-Subroutines; Micro Program: Symbolic Micro

Program, Binary Micro Program; Design of Control Unit: Basic Requirement of Control Unit, Structure of Control Unit, Micro Program Sequencer.

Unit 5 Central Processing Unit

10 Hrs.

General Register Organization: Control Word, Stack Organization and Instruction; Formats-Addressing Modes.

Data Transfer and Manipulation: Data Transfer Instructions, Data Manipulation Instructions, Arithmetic Instructions, Logical and Bit Manipulation Instructions, Shift Instructions.

Program Control: Status Bit Conditions, Conditional Branch Instructions, Subroutine Call and Return, Program Interrupt, Types of Interrupts

Unit 6 Pipeline, Vector Processing and Multiprocessors

6 Hrs.

Parallel Processing, Pipeline Examples: Four Segment Instruction Pipeline, Data Dependency, Handling of Branch Instructions; Vector Processing: Vector operations, Matrix Multiplication;

Laboratory Works

8085 Assembly Language program

1. Multi byte Addition & Subtraction, Multi byte decimal addition & subtraction.
2. Adder and subtractor circuit.
3. Study of 8259 programmable interrupt controller - Development of interrupt service routine.
4. Keyboard/display controller - Keyboard scan - blinking and rolling display.
5. Parallel data transfer
6. Study of Microcomputer development system.

Teaching methods

The general teaching pedagogy includes class lectures, group works, case studies, guest lectures, research work, project work, assignments (theoretical and practical), tutorials and examinations (written and verbal). The teaching faculty will determine the choice of teaching pedagogy as per the need of the topics.

Evaluation

| Examination Scheme | | | | |
|---------------------|----------------|---------------------|-----------|-------|
| Internal Assessment | | External Assessment | | Total |
| Theory | Practical | Theory | Practical | |
| 20 | 20 (3 Hrs.) | 60 (3 Hrs.) | - | 100 |

Text Book

1. Morris Mano.M., Computer System architecture, PIII.

Reference Books

1. Hamacher.V.C., Vranesic.Z.G and Zaky.S.G., "Computer Organisation", McGraw Hill, New York.
2. Hayes, "Computer System Architecture", Mc Graw Hill.



Course Title: **Mathematics II (3 Cr.)**

Course Code: **CACS154**

Year/Semester: **I/II**

Class Load: **5 Hrs. / Week (Theory: 3 Hrs, Tutorial: 1 Hr., Practical: 1 Hrs)**

Course Description

This course includes the topics from calculus and computational methods such as limits and continuity, differentiation & its applications, integration and its applications, differential equation and different computational techniques which are essential as mathematical foundation for computing.

Course Objectives

This course makes students able to cognize the concept Calculus, Computational methods and their applications in the area of Social Science and Computer Application.

Course Contents

Unit 1 Limits and Continuity

6 Hrs.

Limit of a function, Indeterminate forms, Algebraic properties of limit (without proof), Theorems on Limits of Algebraic and Transcendental Function. Continuity of a function, types of discontinuity. Exercises on evaluation of limits and test of continuity. (Mathematica)

Unit 2 Differentiation

6 Hrs.

Ordered Pairs, Cartesian Product, Relation, Domain and Range of a Relation, Inverse of a Relation; Types of Relations: Reflective, Symmetric, Transitive, and Equivalence Relations. Definition of Function, Domain and Range of a Function, Inverse function, Special Functions (Identity, Constant), Algebraic (Linear, Quadratic, Cubic), Trigonometric and Their Graphs. Definition of Exponential and Logarithmic functions, Composite Function. (Mathematica)

Unit 3 Application of Differentiation

8 Hrs.

The derivatives and slope of the curve; Increasing and decreasing function; convexity of curves; maximization and minimization of a function; Differentiation and marginal analysis; price and output; Competitive equilibrium of firm, Illustrations. Drawing graphs of algebraic function by using first and second order derivatives. (Mathematica)

Unit 4 Integration and Its Applications

8 Hrs.

Riemann Integral; Fundamental Theorem (Without Proof); Technique of Integration; Evaluation and Approximation of Definite Integrals; Improper Integrals; Applications of Definite Integrals; Quadrate, Rectification; Volume and Surface Integral. Trapezoidal and Simpson's Rules of Numerical Integration. (Mathematica)

Unit 5 Differential Equations**7 Hrs.**

Differential Equation and its Order and Degree, Differential Equations of First Order and First Degree; Differential Equations with Separable Variables, Homogeneous and Exact Differential Equations.

Unit 6 Computational Method**10 Hrs.**

Linear Programming Problem (LPP), Graphical Solution of LPP in Two Variables, Solution of LPP by Simplex Method (up to 3 variables), Solution of System of Linear Equations by Gauss Elimination Method, Gauss Seidel Method and Matrix Inversion Method, Bisection method, Newton- Raphson Method for Solving Non-linear Equations. (Excel/Matlab)

Laboratory Works

Mathematica and/ or Matlab should be used for above mentioned topics.

Teaching Methods

The general teaching pedagogy includes class lectures, group works, case studies, guest lectures, research work, project work, assignments (theoretical and practical), tutorials and examinations (written and verbal). The teaching faculty will determine the choice of teaching pedagogy as per the need of the topics.

Evaluation

| Examination Scheme | | | | |
|---------------------|----------------|---------------------|-----------|-------|
| Internal Assessment | | External Assessment | | Total |
| Theory | Practical | Theory | Practical | |
| 20 | 20 (3 Hrs.) | 60 (3 Hrs.) | - | 100 |

Text Book

1. Thomas, G. B, Finney, R. S., "*Calculus with Analytic Geometry*", Addison - Wesley, 9th Edition.

Reference Books

1. Monga, G. S., "*Mathematics for Management and Economics*", Vikas Publishing House Pvt. Ltd., New Delhi.
2. Upadhayay, H. P., Paudel, K.C & et al, "*Elements of Business Mathematics*", Pinnacle Publication.
3. Budnick, F. S., "*Applied Mathematics for Business, Economics, and the Social Sciences*", McGraw-Hill Ryerson Limited.

4. Paudel, K. C., GC. F. B., and et al, "*Higher Secondary Mathematics*", Asmita Publication & Distributors Pvt. Ltd, Nepal.
5. Bajracharya D. R., Shreshtha, R. M. & et al, "*Basic Mathematics I, II*", Sukunda Pustak Bhawan, Nepal
6. Sthapit, A.B., Bajracharya, P. M. and et al, "*Fundamentals of Business Mathematics*", Buddha Academic Publisheres & Distributors Pvt. Ltd., Nepal
7. Yamane, T. "*Mathematics for Economist*", Prentice-hall of India.
8. Snedden. I., "*Elements of Partial Differential Equation*", Hill Book Company-McGraw.



Course Title: **Financial Accounting (3 Cr.)**

Course Code: **CACS152**

Year/Semester: **I/II**

Class Load: **5 Hrs. / Week (Theory: 3 Hrs, Tutorial: 1 Hr., Practical: 1 Hr.)**

Course Description

This course includes both theoretical as well as practical concept of financial accounting so that students can understand working principle of financial accounting and hence can use the concept in developing application related to financial sector.

Course Objectives

The general objective of this course is to develop conceptual understanding of the fundamentals of financial accounting system.

Course Contents

Unit 1 Theoretical Framework

4 Hrs.

Meaning and Scope of Accounting: Meaning of Accounting, Procedural Aspects of Accounting, Evolution of Accounting as a Social Science, Objectives of Accounting, Functions of Accounting, Sub-fields of Accounting, Users of Accounting Information, Relationship of Accounting with Other Disciplines, Limitation of Accounting, Role of Accountant in the Society.

Accounting Concepts, Principles and Conventions: Accounting Concepts, Principles & Conventions – an Overview, Qualitative Characteristics of Financial Statements, Fundamentals Accounting Assumptions.

Accounting Standards: Concepts, Objectives, Benefits & An Overview of Nepal Accounting Standards

Accounting Policies: Meaning, Selection of Accounting Policies and Changes in Accounting Policies

Unit 2 Accounting Process

10 Hrs.

Books Of Accounts Leading to The Preparation of Trial Balance, Journal Entries, Double Entry System, Advantage of Double Entry System, Concepts of Transaction and Events, Classification of Accounts, Golden Rules of Accounting, Advantages of Journal, Ledger, Trial Balance, Subsidiary Books Including Cash Books, Capital and Revenue Expenditures and Receipts, Contingent Assets and Contingent Liabilities, Errors Including Rectifications Thereof.

Unit 3 Bank Reconciliation Statement

4 Hrs.

Introductions, Ascertaining the Causes of Differences of Bank Balance in Bank. Column of the Cash-Book and in Pass- Book, Procedure for Reconciling the Cash- Book Balance with the Pass-Book Balance, Importance of Bank Reconciliation Statement.

Unit 4 Depreciation Accounting**4 Hrs.**

Concepts of Depreciation, Objectives for Providing Depreciation, Methods for Providing Depreciation, Accounting for Depreciation

Unit 5 Inventories**4 Hrs.**

Meaning, Basis and Technique of Inventory Valuation, Inventory Recording System, Stock Taking

Unit 6 Preparation of Final Accounts for Sole Proprietors**10 Hrs.**

Concept of Closing Entries in respect of Trading and Profit & Loss Account, Concept of Accrual Basis of Accounting, Matching Concept and Dual Aspects, Concept on Manufacturing Account, Preparation of Balance Sheet, Arrangement and Classification of Assets and Liabilities

Unit 7 Introduction to Company Accounts**9 Hrs.**

Meaning of Company, Salient Features of Company, Types of Company, Preparation of Financial Statements, Share Capital and its types, Debentures and its types, Distinction between Debentures and Shares, Issue of Shares and Debentures, Redemption of Preference Shares

Laboratory Works

Laboratory works should be carried out using any accounting packages (such as Tally, Fact etc.) to implement the concepts discussed in the above mentioned topics.

Teaching Methods

The general teaching pedagogy includes class lectures, group discussions, case studies, guest lectures, research work, project work, assignments (theoretical and practical), tutorials and examinations (written and verbal), depending upon the nature of the topics. The teaching faculty will determine the choice of teaching pedagogy as per the need of the topics.

Evaluation

| Examination Scheme | | | | |
|---------------------|----------------|---------------------|-----------|-------|
| Internal Assessment | | External Assessment | | Total |
| Theory | Practical | Theory | Practical | |
| 20 | 20 (3 Hrs.) | 60 (3 Hrs.) | - | 100 |

Text Book

1. Andrew Thomas & Anne Marie Ward, "*Introduction to Financial Accounting 7/e*", Mc Graw Hill 2012 ISBN: 9780077132682

Reference Books

1. Narayanaswamy, R., "*Financial Accounting: A Managerial Perspective*", Prentice Hall of India, New Delhi.
2. Porter, Gary A. Norton, Curtis L., "*Financial Accounting: The Impact on Decision Makers*", The Dryden Press, USA.



Course Title: **English II (3 Cr.)**

Course Code: **CACS103**

Year/Semester: **I/II**

Class Load: **4 Hrs. / Week (Theory: 3 Hrs., Tutorial: 1 Hr.)**

Course Description

The course consists of literary reading, business communication skills along with critical reasoning to inculcate cognitive ability and workplace communicative competence in the students. It consists of science fiction stories, business writing and exercises based on critical reasoning. The course aims to enhance language proficiency and stimulate creative and critical thinking and analysis.

Course Objectives

The course has following specific objectives:

- To impart reading skills in students and make them comprehend and analyze literary texts.
- To frame students' logical capability including analyzing reasoning, assessing credibility, making sound decisions and solving dilemmas.
- To help students to develop confidence and expertise in composing effective professional documents.

Course Contents

Unit1 Science Fiction Stories

10 Hrs.

1. H. G. Wells: "The Land Ironclads"
2. Jack Williamson: "The Metal Man"
3. Brian Aldiss: "Who can Replace a Man?"
4. J. G. Ballard: "Billenium"
5. William Gibson: "Burning Chrome"

Unit2 Business Communication

9 Hrs.

1. Rules of Good Writing
2. Fax Message and Electronic Mails
3. Memos, Reports and Meetings

Unit3 Persuasive Communication

3 Hrs.

1. Notices, Advertisements and Leaflets

Unit4 Oral Communication

3 Hrs.

1. Oral Presentation Skills

Unit5 Critical Reasoning

20 Hrs.

1. Analyzing Reasoning
2. Evaluating Reasoning

3. Reasoning Implications
4. Evaluating Evidence and Authorities
5. Two Skills in the Use of Language
6. Exercising the skills of Reasoning
7. Constructing Reasoning

Teaching Methods

The course expects students' effective participation and instructors' proper guidance to fulfill the objectives of the course. The teacher should engage students in language activities and minimize lectures. Student centered teaching method will engage students in the pursuit of learning and bring about positive results.

Evaluation

Internal Evaluation: 40%

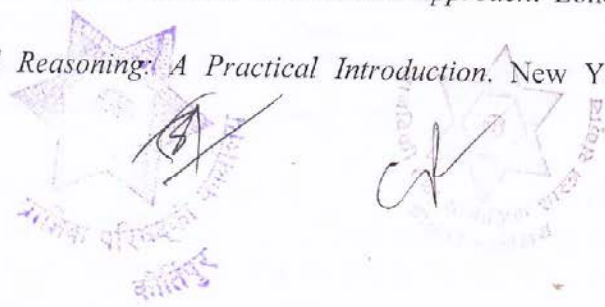
- Attendance - 5
- Presentation/classroom participation- 5
- Writing sample- 15
- Mid-term test- 15

Final Evaluation: 60%

- Critical response on stories
- Business writing tasks
- Logical reasoning activities

Text Books

1. Shippey, Tom. *The Oxford Book of Science Fiction Stories*. London: OUP, 2003.
2. Taylor, Shirley. *Communication for Business: A Practical Approach*. London: Longman, 2005.
3. Thompson, Anne. *Critical Reasoning: A Practical Introduction*. New York: Rutledge, 2009.



Course Title: **C Programming (4 Cr.)**

Course Code: **CACS151**

Year/Semester: **I/II**

Class Load: **8 Hrs. / Week (Theory: 4 Hrs, Tutorial: 1 Hr., Practical: 3 Hrs)**

Course Description

This course includes both theoretical as well as practical concept of programming. Practical skill of programming are provided using C language which includes basic concept of C, operators and expressions, basic input/output function, control structures, array & string, function, pointer, structure and union, file handling and graphics in C.

Course Objectives

The general objectives of this course are to provide fundamental concepts of programming language, programming technique and program development using C programming language.

Course Contents

Unit 1 Programming Language

10 Hrs.

Introduction to Programming Language, Types of Programming Language, Language Processor, Program Errors, Features of Good Program, Different Programming Paradigm, Software Development Model, Program Development Life Cycle, System Design Tools.

Unit 2 Programming Technique

5 Hrs.

Introduction to Programming Technique, Top down & Bottom up Approach, Cohesion and Coupling, Structured Programming, Deterministic and Non-deterministic Technique, Iterative and Recursive Logic, Modular Designing & Programming.

Unit 3 Basic Concept of C

5 Hrs.

Introduction, History, Features, Advantages and Disadvantages, Structure of C program, Compiling Process, C Preprocessor and Header Files, Library Function, Character Set, Comments, Tokens and its types, Data types, Escape Sequences, Preprocessors Directives.

Unit 4 Operators and Expressions

3 Hrs.

Arithmetic Operator, Relational Operator, Logical Operator, Assignment Operator, Increment/decrement Operator, Conditional Operator, Bitwise Operator, Comma Operator, sizeof Operator, Operator Precedence and Associativity, Expressions and its Evaluation, Type Casting in Expression, Program Statement.

Unit 5 Input and Output**3 Hrs.**

Input/Output Operation, Formatted I/O (scanf, printf), Unformatted I/O (getch-putch, getche, getchar-putchar and gets-puts)

Unit 6 Control Structure**6 Hrs.**

Introduction, Type of Control Structure (Branching:if, if else, if elseif and switch case, Looping: while, do while and for and Jumping: goto, break and continue), Nested Control Structure.

Unit 7 Array**6 Hrs.**

Introduction, Declaration, Initialization, One Dimensional Array, Multi Dimensional - Array, Sorting (Bubble, Selection), Searching Sequential), String Handling.

Unit 8 User Defined Function**5 Hrs.**

Introduction, Components, Function Parameters, Library Function vs. Users Defined Function, Different Forms of Function, Recursion, Passing Array to Function, Passing String to Function, Accessing a function (Call By Value & Call By Reference), Macros, Storage Class.

Unit 9 Pointer**6 Hrs.**

Introduction, The Address(&) and Indirection(*) Operators, Declaration & Initialization, Pointer to Pointer, Pointer Expressions, Pointer Arithmetic, Passing Pointer to a Function, Pointer and Array, Array of Pointer, Pointer and String, Dynamic Memory Allocation.

Unit 10 Structure**5 Hrs.**

Introduction, Declaration, Initialization, Nested Structure, Array of structure, Array within Structure, Passing Structure & Array of Structure to function, Structure & Pointer, Bit Fields, Union and Its Importance, Structure vs. Union.

Unit 11 Data File Handling**4 Hrs.**

Introduction, Types of File, Opening & Closing Data File, Read & Write Function, Writing & Reading Data To and From Data File, Updating Data File, Random Accessing Files, Printing a File.

Unit 12 Introduction to Graphics**2 Hrs.**

Initialization, Graphical Mode, Graphical Functions.

Laboratory Works

Laboratory works should be done covering all the topics listed above and a small project work should be carried out using the concept learnt in this course only. Project should be assigned on individual basis.

Teaching Methods

The general teaching pedagogy includes class lectures, group discussions, case studies, guest lectures, research work, project work, assignments (theoretical and practical), and examinations (written and verbal), depending upon the nature of the topics. The teaching faculty will determine the choice of teaching pedagogy as per the need of the topics.

Evaluation

| Examination Scheme | | | | |
|---------------------|----------------|---------------------|-----------|-------|
| Internal Assessment | | External Assessment | | Total |
| Theory | Practical | Theory | Practical | |
| 20 | 20 (3 Hrs.) | 60 (3 hrs.) | - | 100 |

Text Books

1. Brain W. Kerighan & Dennis Ritchie, "*The C Programming Language*", Second Edition, Prentice Hall, 1988, ISBN: 978-0131103627
2. Byrons S. Gotterfried, "*Programming with C, 3/e*", McGraw Hill Education India, 2013, ISBN: 978-0-07-014590-0

Reference Books

3. Al Kelley, Ira Pohl, "*A Book on C*", 4th Edition, Pearson Education, 1998, ISBN: 978-0201183993
4. Deitel & Deitel, "*C: How to program*", 7th Edition, Pearson Education, 2012, ISBN: 9780273776840
5. E Balagurusamy, "*Programming in ANSI C, Sixth Edition*", Tata Mc GrawHill, 2012 ISBN: 9781259004612
6. Yeshvant Kanetkar, "*Let us C*", 13th Edition, BPB Publication, 2013, ISBN: 978-81-8333-163-0
7. Ramesh Rimal & et. al., "*Computer Science-II, Revised Edition*", Buddha Academic Publishers and Distributors Pvt. Ltd. Nepal, 2013

