



BACHELOR OF COMPUTER SYSTEM AND INFORMATION TECHNOLOGY (BCSIT)

CURRICULUM

**Faculty of Management Studies
Pokhara University**

2023



POKHARA UNIVERSITY
BACHELOR OF COMPUTER SYSTEM AND INFORMATION TECHNOLOGY (BCSIT)

Program Objectives

The Bachelor of Computer System and Information Technology (BCSIT) which was previously named as Bachelor of Computer Information System (BCIS) program of Pokhara University provides students with foundational knowledge and practical skills needed in various areas of information systems, computer technology, and management. The program aims to develop students' intellectual ability, technical skills, and managerial applications through an appropriate blending of computer, information technology, and business courses.

The objectives of the Bachelor of Computer Systems and Information Technology (BCSIT) program are as follows:

- To develop a strong foundation in computer systems, hardware, software, and information technology, ensuring that students grasp fundamental principles and technologies.
- To foster problem-solving abilities, enabling students to analyze complex technical issues, identify solutions, and effectively implement strategies to address them.
- To provide students with the knowledge and skills to design, develop, and maintain software applications using relevant programming languages and methodologies.
- To teach students how to manage information systems, including database management, network administration, and cybersecurity, ensuring data security and availability.
- To equip students with the ability to collect, process, and analyze data, enabling meaningful insights and data-driven decision-making.
- To develop strong written and verbal communication skills, allowing students to convey technical information to diverse audiences and foster collaboration.
- To offer a foundation in business and management principles, helping students understand how IT aligns with organizational goals within a business context.
- To align the curriculum with industry-recognized certifications to enhance employability and industry competitiveness.

Curricular Structure

The coursework gives students a broad and holistic view of the complexity of issues in today's information management and business environment. This program provides the basis for career growth, and also prepares for higher studies. The curriculum comprises the following five distinct components:

- **Foundation Courses:** These courses develop students' communication skills and provide them with a strong foundation in economics, statistics, mathematics, and the legal environment of business and technology.
- **Management Core Courses:** These courses will help students understand the basic principles and practices in the functional areas of management.
- **CIS Core Courses:** These courses will help students to understand principles and practices in the functional areas of computer information management specifically.
- **Concentration Courses:** The elective courses will help students to develop specialized and focused skills in the areas of their choice.



- **Project Work and Internship:** Students are required to undertake an independent capstone project that involves fieldwork and empirical analysis of the information collected from the field. After that, they will prepare a project report in a prescribed format. The internship provides students with an opportunity to gain real-life experience by working in an organization for six to eight weeks.

Program Features

The BCSIT is a four-year program structured in eight semesters. A student needs to complete 127 credit hours of coursework, project work and internship for graduation.

Besides lectures, the classes are facilitated by case studies, group discussions, project assignments, field visits, class presentations and other teaching methods. In order to develop communication and interpersonal skills, students are emphasized to participate in class activities, group discussions and individual presentations.

The medium of instruction and examination for this program will be English, and a student is expected to have good English language proficiency with acceptable communication skill.

The Semester System

The prominent feature of the semester system is the continuous evaluation of a student's performance, and flexibility given to the students to progress at a pace suited to his/her individual ability as per the credit requirements.

The credit hour assigned to each course of this program varies depending on its lecture, tutorial and practical work hours in a week. One lecture/contact hour per week per semester is assigned one credit. That is, a three credit hours course has 48 class hours. A faculty member is assigned to teach each of the courses. If the course is taught by more than one faculty member, then one of the members are designated as the coordinator of that course.

Entry Requirements and Admission Procedures

▪ **Eligibility**

The entry requirement for a new student in BCSIT will be Intermediate or Higher Secondary level (10+2) or Proficiency Certificate Level (PCL) with second division or equivalent as recognized by Pokhara University. In addition, the student must pass the entrance test conducted by the concerned colleges.

▪ **Documents Required**

The applicant is required to submit the following documents with the application form made available by the concerned college/school by paying a predetermined fee:

- I. Completed and signed BCSIT application form.
- II. Official transcripts from the academic institutions previously attended.

Certificates of all degrees should be photocopied and submitted with proper attestation. Enrolment is conditional upon completion of all admission formalities including payment of all fees as determined by the college. Incomplete applications shall not be processed.



- **Admission Procedures**

A notice inviting applications for admission is publicly announced. Application forms and information brochures are provided, on request, after the payment of the prescribed fee. The concerned college scrutinizes the application. The eligible candidates are informed to take the entrance test. The date and time for the entrance test are informed to the applicants by the concerned colleges. The college may also interview the candidates for the final selection for admission.

The candidates who are given provisional admission under special conditions are required to submit all necessary documents within a month after their regular classes begin. A student who fails to do so will have his/ her admission canceled.

- **Academic Schedule and Course Registration**

An academic session consists of two semesters. The Fall Semester starts in September and Spring Semester starts in March. Students are normally admitted to the program in the Fall semester.

Students are required to register the courses by themselves from the concerned college at beginning of each semester. Registration in absence may be allowed only in rare cases at the discretion of the principal. In normal cases, a student's nominee will not be allowed for course registration of the concerned student, but he/she may complete other formalities.

- **Addition and Withdrawal from the Course**

A student will have the option to add or drop from the course. This can, however, be done only during the first three weeks of the semester. A student wishing to withdraw from a course should apply on the prescribed form within one month of the start of the semester.

- **Attendance Requirements**

A student must attend every lecture, tutorial, seminar, and practical class. However, to accommodate for late registration, sickness and other contingencies, the attendance requirements will be a minimum of 80% of the classes actually held. If a student is absent in the class for more than four weeks without the permission of the concerned authority, his/her name will be removed from the college roll.

- **Normal and Maximum Duration of Study**

The duration for the completion of the program is as follows:

- Normal duration: 4 Years (8 Semesters)
- Maximum Duration: 8 Years

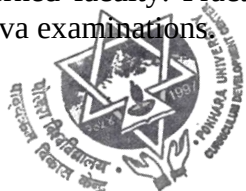
A full-time student has to take a minimum of 12 credits.

Evaluation System

External evaluation 50 Marks plus internal evaluation 50 Marks

Internal evaluation is again divided into two - Theory 30 Marks + Practical 20 Marks

- The internal evaluation comprises quizzes, tutorials, lab work, home assignments, class tests, class participation, term papers, formal internal examination etc. and will be evaluated by concerned faculty. Practical marks 20 will be evaluated through lab tests, project work and viva examinations.



- The external evaluation will be conducted by the Office of the Controller of Examinations through semester-end examinations.

▪ A fifty percent weightage is given to both internal and external evaluation (semester-end examination). A student is required to pass both internal and external evaluations independently. The final grade will be awarded on the basis of his/her consolidated performance in all three internal, lab test/ project work/viva and external evaluation.

A student will get NOT QUALIFIED (NQ) status in the internal evaluation if his/her performance falls below the minimum requirement. Such students will not be allowed to appear in the semester-end examination of that particular course.

Internal Evaluation Theory		
Evaluation	Full Marks	Weightage
Assessment	15	50%
Assignment	10	25%
Attendance	5	25%

Internal Evaluation Practical/Viva/Project		
	Full Marks	Weightage
Lab attendance	5	25%
Report	5	25%
Viva	5	25%
Problem Solving	5	25%

Assessment Evaluation	Full Marks	Weightage
Internal Evaluation Theory	30	30%
Internal Evaluation Practical/viva/project	20	20%
External/University Exam	50	50%

Evaluation of Concentration Courses

The concerned school/college will conduct internal and semester-end examinations of the elective courses following the rules and directives of the OCE. The school/college must properly preserve answer copies and other necessary documents of these examinations and submit these to the Office of the Dean as and when instructed. The school/college must forward final grades of students to the OCE within 3 weeks after completion of semester-end examinations and the results should not be disclosed to students till formal notification is received from the OCE. The answer sheets must be preserved in sealed bags at the respective school/college for a period of six months.

Grading System

Pokhara University follows a four-point letter grade system. The letter grades awarded to students will be as follows:



Grade	Grade Point	Description
A	4.0	Excellent
A-	3.7	
B+	3.3	
B	3	Good
B-	2.7	
C+	2.3	
C	2.0	Satisfactory
C-	1.7	
D+	1.3	
D	1	Minimum Requirement
F	0	Fail

In some rare and unusual circumstances, if a student is unable to complete all the required work for the course, he/she may be temporarily marked with an incomplete grade "I". If all the required works are not completed within the following semester, the letter "I" will be automatically converted into "F".

The performance of a student is evaluated in terms of the following two indices:

- The semester grade point average (SGPA) which is the grade point average for the semester and is given by:

$$SGPA = \frac{\text{Total honor points earned in a semester}}{\text{total number of credit hours taken in a semester}}$$
- The cumulative grade point average (CGPA) which is the grade point average for all completed semesters and is given by:

$$CGPA = \frac{\text{Cumulative total honor points earned}}{\text{cumulative total number of credit hours taken}}$$

Repeating a Course

A course may be taken only once for grade: Since passing all courses individually is a degree requirement, the student must retake the failing course when offered and must successfully complete the course. A student will be allowed to retake a maximum of two courses to achieve a minimum CGPA of 2.0. The grade earned on the retake examination will substitute the earlier grade earned by the student in that course. A student can retake a course only when it is offered by the college/University.

Credit Transfer and Withdrawal

Up to 25% of the total credit hours of the courses completed in an equivalent program of a recognized institution may be transferred/ waived for credit on the recommendation of the principal of the college. For the credit transfer, a student must receive a "B" or above grade in the respective course. Courses taken earlier than five years from the time of transfer may not be accepted for the credit transfer. However, a student transferring from one program to another program of Pokhara University may receive a credit transfer of all the compatible courses completed with at least a "C" grade.



A student may apply for withdrawal from the entire semester only on medical grounds. The principal will examine the application for semester withdrawal, and depending on the gravity of the case, he/she will make the decision. No partial withdrawal from the courses registered in a semester will be considered.

Project Work

Students are required to undertake two mini-projects and one independent and comprehensive capstone project that involves fieldwork and empirical analysis. At the end, the students must prepare a report of this work in the prescribed format and submit it to the authorized person/body. The objective of these project works is to develop students' skills in research, particularly in areas of data collection, processing, analysis, and report writing. These reports will be evaluated by the concerned authority.

Internship

Students need to do an internship as approved by the college. The purpose of the internship is to provide students with real-life on-the-job exposure and an opportunity to apply theoretical concepts in real-life situations. Students' interests and intended areas of concentration are taken into account while making the internship placement decisions.

Unfair Means

Students are strictly forbidden from adopting unfair means in class assignments, tests, report writing, and final examinations.

The following would be considered as the adoption of unfair means during examination:

- Communication with fellow students for help
- Copying from another student's script/report/paper.
- Copying from disk, palm of hand, mobile phone, or other incriminating documents.
- Processing from any incriminating documents, whether used or not.
- Any direct or indirect approach to influence teachers for the grade.
- Unruly behavior that disrupts academic programs.

If the instructor detects a student using unfair means, the student may be given an 'F' at the discretion of the Examination Board. Adoption of unfair means may further result in the expulsion of the student from the program, college and the University as well.

Provision for Re-totaling and Rechecking

Students may apply for re-totaling or rechecking of their grades as per university rules.

Dismissal from the Program

A student must obtain 2.0 CGPA at the undergraduate level. If his/her performance in the past semesters does not show the possibility of maintaining this CGPA, he/she may be dismissed from the program.

Degree Requirements

For graduation, a student should:

- Earn at least a 'D' grade in each course as specified in the grading system section,
- Complete the internship with a 'Pass' grade,



- Complete all the courses, project work, and internship as specified in the curricular structure,
- Section within the maximum time period mentioned in the duration of the study section,
- Maintain at least 2 CGPA.

Distinction and Dean's List

A student who obtains a 3.6 CGPA or above will receive the BCSIT degree with distinction. The Dean's list recognizes outstanding academic performances in the FMS. To qualify, a student must have 3.7 CGPA or above.

Curriculum Structure

Foundation Courses		(18 Credits)
Course Code	Course Title	Credit Hours
ENG 111	English	3
MTH 113	Mathematics I	3
ENG 112	Business Communication	3
MTH 114	Mathematics II	3
STT 220	Linear Algebra and Probability	3
ECO 322	Applied Economics	3
Management Courses		(27 Credits)
Course Code	Course Title	Credit Hours
MGT 222	Principles of Management	3
FIN 222	Fundamentals of Financial Management	3
MKT 351	Digital Marketing	3
MGT 322	Organizational Behavior	3
RCH 322	Research Methods	3
MGT 422	Strategic Management	3
MGT 423	Management of Human Resources	3
LAW 422	Legal Aspects of Business and Technology	3
MGT 424	Innovation and Entrepreneurship	3
Information Technology and Computing Courses		(57 Credits)
Course Code	Course Title	Credit Hours
CMP 173	Internet Technology I	3
CMP 171	Fundamentals of Computer Systems	3
CMP 172	Programming Language	3
CMP 174	Digital Systems	3



CMP 175	Object-Oriented Language (Java)	3
CMP 176	Data Structure and Algorithm	3
CMP 271	Database Management System	3
CMP 272	Object-Oriented Analysis and Design	3
CMP 273	Internet Technology II (Programming)	3
CMP 275	Computer Architecture and Microprocessor	3
CMP 274	Numerical Methods	3
CMP 276	Software Engineering and Project Management	3
CMP 277	Data Communication and Networks	3
CMP 381	Operating Systems	3
CMP 471	Artificial Intelligence	3
CMP 384	Computer Graphics	3
CMP 382	Cloud Computing	3
CMP 383	Digital Economy	3
CMP 472	Information System Security	3

Concentration Courses (12 Credits)

Course Code	Course Title	Credit Hours
	Concentration I	3
	Concentration II	3
	Concentration III	3
	Concentration IV	3

Project and Internship (13 Credits)

Course Code	Course Title	Credit Hours
PRJ 181	Project I	2
PRJ 281	Project II	2
PRJ 481	Major Project	4
INT 494	Internship	5

Summary Course structure

SN	Course	No. of Courses	Credit Hours	Percentage (%)
1.	Foundation Courses	6	18	14.17
2.	Management Courses	9	27	21.25
3.	Information Technology and Computing Courses	19	57	44.88
4.	Concentration Courses	4	12	9.44
5.	Project Work	3	8	6.29
6.	Internship	1	5	3.93
Summary of Total Courses		42	127	100



POKHARA UNIVERSITY
Bachelor of Computer System and Information Technology (BCSIT)
Semester-wise Curriculum Structure

Semester I			Semester II		
Code	Course Title	Credits	Code	Course Title	Credits
ENG 111	English	3	ENG 112	Business Communication	3
MTH 113	Mathematics I	3	MTH 114	Mathematics II	3
CMP 173	Internet Technology I	3	CMP 174	Digital Systems	3
CMP 171	Fundamentals of Computer Systems	3	CMP 175	Object-Oriented Language (Java)	3
CMP 172	Programming Language	3	CMP 176	Data Structure and Algorithm	3
			PRJ 181	Project I	2
Total Credits		15	Total Credits		17
Semester III			Semester IV		
Code	Course Title	Credits	Code	Course Title	Credits
STT 220	Linear Algebra and Probability	3	CMP 275	Computer Architecture and Microprocessor	3
CMP 271	Database Management System	3	CMP 274	Numerical Methods	3
CMP 272	Object-Oriented Analysis and Design	3	CMP 276	Software Engineering and Project Management	3
CMP 273	Internet Technology II (Programming)	3	CMP 277	Data Communication and Networks	3
MGT 222	Principles of Management	3	FIN 222	Fundamentals of Financial Management	3
			PRJ 281	Project II	2
Total Credits		15	Total Credits		17
Semester V			Semester VI		
Code	Course Title	Credits	Code	Course Title	Credits
MKT 351	Digital Marketing	3	CMP 384	Computer Graphics	3
CMP 381	Operating Systems	3	RCH 322	Research Methods	3
MGT 322	Organizational Behavior	3	CMP 382	Cloud Computing	3
CMP 471	Artificial Intelligence	3	ECO 322	Applied Economics	3
	Concentration I	3		. Concentration II	3
Total Credits		15	Total Credits		15



Semester VII			Semester VIII		
Code	Course Title	Credits	Code	Course Title	Credits
MGT 422	Strategic Management	3	LAW 422	Legal Aspects of Business and Technology	3
MGT 423	Management of Human Resources	3	MGT 424	Innovation and Entrepreneurship	3
CMP 383	Digital Economy	3	INT 494	Internship	5
CMP 472	Information System	3		Concentration IV	3
PRJ 481	Security	3			
	Major Project	4			
	Concentration III	3			
Total Credits		19	Total Credits		14

Concentration Computing			Concentration Data Science		
Code	Course Title	Credits	Code	Course Title	Credits
	Python Programming	3		Advance Database	3
	Advance Java	3		Data Analysis and Modeling	3
	Compiler Design and Construction	3		Data Warehousing and Data Mining	3
	Mobile Computing	3		Database Administration	3
	Dot Net	3		Artificial Intelligence and Machine Learning	3
	Software Project	3		Distributed Database Management	3
	Open-source Technology	3		Object Oriented Database Management	3
	more..			more..	

Concentration Networking and Cyber Security			Concentration Management Science and Systems		
Code	Course Title	Credits	Code	Course Title	Credits
	Advance Networking with IPV6	3		MIS and e-business	3
	Wireless Communication	3		E-governance	3
	Network Security	3		Social Entrepreneurship	3
	Embedded System	3		Financial Accounting	3
	Routing and switching	3		International Business Knowledge	3
	System Admin	3		Management	3
	Distributed System	3		Managerial Accounting	3
	Ethical Hacking	3		more..	



Concentration Multimedia Technology		
Code	Course Title	Credits
	Fundamentals of Animations	3
	3D Modeling	3
	Moving Images and VFX	3
	Multimedia Development Tools	3
	Sound and Music Production	3
	Advance Animation Techniques	3
	more..	



Pokhara University
Faculty of Management Studies

Course Code: ENG 111
Course Title: **English**
Nature of the course: Theory
Year: First, Semester I
Level: Bachelor

Full marks: 100
Pass marks: 45
Credit: 3Hrs
Total periods: 48 hours
Program: BCSIT

1. Course Description

This course comprises all aspects of the English language including speaking, pronunciation, listening, reading, and writing. The focus is on improving the students' capacity to communicate clearly and effectively. The syllabus for the lessons on the English language is based on the course books, while the faculty will also use other teaching tools and materials, including suggestions and input received from the students so the content of the class can be more interactive, useful, and interesting. Students are expected to participate as much as possible, which means they will work individually, in pairs, in groups, and with the whole class. The faculty will provide feedback on their spoken and written English and correct errors for the benefit of students at large. This includes basic understanding and use of everyday English phrases, the importance of language skills for information technology professionals, understanding spoken English in various contexts, and improving pronunciation, intonation, and fluency in spoken English and reading strategies like Skimming, Scanning, and Close reading

2. General Objectives

The general objectives of this course are;

- To increase and enhance the English language proficiency
- To develop and enhance communication skills
- To develop a culture and aptitude for literary appreciation
- To learn and improve grammar and syntax, with expansion of vocabulary
- To develop critical thinking skills
- To develop basic research and report-writing skills
- To improve writing skills and proficiency
- To learn and improve oral presentation
- To enhance independent and digital learning
- To promote peer collaboration and reflective writing
- To strengthen listening capabilities to understand discussions and presentations
- To improve writing skills for creating clear and concise reports, emails, and technical documentation.
- Acquire a comprehensive technical vocabulary and grasp industry-specific terminologies
- Participate and apply English communication in professional contexts

3. Method of Instructions

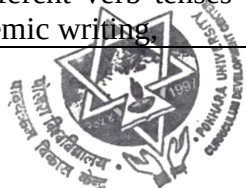
Generation Instructional Technique: Lecture, Discussion, Interactive Activities, Grammar and Vocabulary Exercises, Oral Presentations and Readings.

Specific Instructional Technique: Self-directed learning and Case Study.

4. Content in Detail with specific objective



Specific Objectives	Contents
- Provide an overview and highlight the importance of key language skills - To develop and enhance listening, speaking, reading, and writing skills - Understand and use basic everyday English phrases - Acquire a basic repertoire of words and phrases - Highlight the importance of language skills for information technology professionals	Unit 1: Introduction to Language Skills [2 Hrs.] 1.1 Overview of the four language skills - listening, speaking, reading, and writing; 1.2 Importance of language skills for professionals in information technology; 1.3 Introduction to language learning strategies to aid in comprehension
Specific Objectives	Contents
- Develop the ability to understand spoken English in various contexts - Develop the capacity to understand and conduct technical discussions and presentations - Improve note-taking skills in meetings and discussions - Capture key points and ideas from spoken English - Understand sentences and frequently used expressions related to immediately relevant areas	Unit 2: Listening Skills [6 Hrs.] 2.1 Understanding English language; Spoken English in various contexts; 2.2 Technical discussions and presentations; Note-taking skills; 2.3 Key points and ideas from spoken English.
Specific Objectives	Contents
- Develop the ability to communicate effectively in spoken English - Give presentations and participate in group discussions - Communicate effectively in simple and routine tasks - Describe in simple terms their immediate environment and matters of interest - Improve pronunciation, intonation, and fluency in spoken English	Unit 3: Speaking Skills [6 Hrs.] 3.1 Spoken English; Communications Skills; Presentation of Ideas; 3.2 Participation in Group Discussions; 3.3 Pronunciation, Intonation, and Fluency in English Language.
Specific Objectives	Contents
- Differentiate between academic and non-academic language - Understand pronouns, different types of pronouns and their usage in academic writing - Understand the different verb tenses and their usage in academic writing.	Unit 4: English Grammar for Accuracy [8 Hrs.] 4.1 Academic and Non-Academic Language; Pronoun Usage; 4.2 Understanding different types of pronouns and their usage in academic writing; Verb Tenses:



- Understand and make use of subject and verb agreement - Learn to maintain consistency in verb tense throughout a written work - Build an understanding of passive voice and transition words	4.3 Understanding the different verb tenses and their usage in academic writing; 4.4 Subject and Verb Agreement, Maintaining consistency in verb tense throughout 4.5 a written work; 4.6 Passive voice; 4.7 Transition words
Specific Objectives	Contents
- Develop reading strategies like skimming, scanning, and close reading - Develop the ability to read and comprehend technical and literary articles and materials in English. - Demonstrate grammatical control and manage short utterances Improve reading speed and comprehension through inference and interpretation skills	Unit 5: Reading Skills [8 Hrs.] 5.1 Reading Strategies; Skimming, Scanning, and Close Reading; 5.2 Reading and Comprehending Technical and Literary Works; 5.3 Reading Speed and Comprehension; Inference and Interpretation Skills
Specific Objectives	Contents
- Develop note-taking, summarizing, paraphrasing, and referencing skills to achieve language proficiency and precision. - Discourage and prevent plagiarism in academic writing - Develop strategies for promoting ethical integrity in higher education	Unit 6: Basic Research Skills [8 Hrs.] 6.1 Note-taking; Summarizing; 6.2 Paraphrasing; Referencing skills; 6.3 Precision for Proficiency; 6.4 Ethical Integrity in Academic Writing
Specific Objectives	Contents
- Develop the ability to write technical documents, such as business reports, emails and memos in clear, accurate, and concise English - Improve grammar, vocabulary, and sentence structure in written English	Unit 7: Writing Skills [10 Hrs.] 7.1 Grammar and Vocabulary; 7.2 Sentence Structure in Written English, Writing Papers; Writing Technical Documents; 7.3 Business Report Writing; 7.4 Email and Memo Writing

Additional Practical Works:

Below are some practical works and activities that can improve speaking and listening skills of the students of this course.

- Listening:** Various learning tools can be used to provide students with audio recordings of technical discussions, presentations, or interviews. Students can then listen to the recordings and practice their listening skills by answering questions or summarizing what they heard.
- Pronunciation:** Various learning tools can be used to provide students with audio recordings of words and phrases in English. Students can then practice their pronunciation skills by listening to and repeating the words and phrases.
- Role Play:** Various learning tools can be used to simulate real-life scenarios, such as job interviews or customer service interactions. Students can then practice their



speaking skills by role-playing the scenarios and receiving feedback from the instructor or other students.

- **Language Testing:** Various learning tools can be used to administer speaking and listening tests, or language proficiency tests. Students can then take the tests at the same time and receive instant feedback on their performance.

Note: Faculties can create a small portfolio of tasks for students by integrating all of the above skills.

5. Evaluation system and Student's Responsibilities

Evaluation System

In addition to the formal exam(s), the internal evaluation of a student may consist of quizzes, assignments, lab reports, projects, class participation, etc. The tabular presentation of the internal evaluation is as follows.

External Evaluation	Marks	Internal Evaluation	Weight	Marks
Semester-End examination	50	Theory		50
		Attendance & Class Participation	10%	
		Assignments	20%	
		Presentations/Quizzes	10%	
		Internal Assessment	60%	
Total External	50	Total Internal		50
Full Marks: 50 + 50 = 100				

7. Student's Requirements

Each student must secure at least 45% marks separately in both internal assessment and practical evaluation with 80% attendance in the class in order to appear in the Semester End Examination. Failing to get such a score will be given NOT QUALIFIED (NQ) to appear in the Semester-End Examinations. Students are advised to attend all the classes, formal exams, tests, etc. and complete all the assignments within the specified time period. Students are required to complete all the requirements defined for the completion of the course.

8. Prescribed Books and References

Prescribed Text Books:

1. Puchta, H., & Stranks, J. (2013). *English in Mind*. Cambridge University Press.
2. Eastwood. (2005). *Oxford Practice Grammar*. Karachi: Oxford University Press.
3. Elbaum, S. N. (2009). *Grammar in context: 1*. Heinle/Cengage Learning.

Reference Books:

1. Kissner, E. (2006). *Summarizing, paraphrasing, and retelling: Skills for Better Reading, Writing, and Test Taking*. Heinemann Educational Books.
2. Godfrey, J. (2018). *How to use your reading in your essays*. Bloomsbury Publishing.
3. Steele, W. R. (2009). *Presentation Skills 201: How to Take it to the Next Level as a Confident, Engaging Presenter*. Outskirts Press.



Pokhara University
Faculty of Management Studies

Course Code: MTH113
Course title: **Mathematics I**
Nature of the course: Theory
Year: First, Semester I
hours
Level: Bachelor

Full marks: 100
Pass marks: 45
Credit: 3 Hrs.
Total periods: 48
Program: BCSIT

1. Course Description

This course covers basic logic, set theory, the real number system, functions and graphs, limit and continuity, derivatives and their applications, integration, matrices and determinants, and permutations and combinations.

2. Course Objective:

The course is designed with the following objectives:

- To acquaint the students with fundamental mathematical concepts with a focus on how they apply to business, economics, and information technology.
- To develop skills among the students that they need to effectively apply mathematical techniques to real-world problems.

3. Method of Instructions

General Instructional Technique: Lecture, Discussion, Readings and Question Answer

Specific Instructional Technique: Self-Directed Learning and Case Study

4. Course Detail with Specific Objectives

Specific Objectives	Content
• Comprehend the idea of logic and able to use it to support mathematical claims as well as practical issues. • Use various set operations to solve the specific problem and determine the number of items in a given set.	Unit 1: Basic Concept [9 Hrs.] 1.1. Elementary Logic 1.2. Connectives, Quantifiers, 1.3. Basic laws of logic, 1.4. Quantifiers 1.5. Techniques of proof. 1.6. Sets, Types of sets, Venn diagram, 1.7. Set operations, Laws of the algebra of sets (without proof), 1.8 Real number system, Representation of real numbers on the Real line, 1.9 Properties of real numbers (without proof), ordered sets, Inequalities, 1.10 Intervals, Absolute value, Cartesian product, Relation.



Specific Objectives	Contents
- Identify the dependent and independent variables to find the domain and range of the function. - Explain the concept of limit and continuity and use it in real-life problems.	Unit 2: Functions, Limit, and Continuity [8 hrs.] 2.1. Constants and variables, Concept of functions, 2.2 Domain, and range of a function, Types of functions (algebraic, logarithmic, Trigonometric, and exponential functions), 2.3. Graphic representation 2.4 Application of functions to business and economics. 2.5 Limit of a function, properties of Limit, Indeterminate Forms, 2.6 Limits of Polynomial and Rational Functions, Limits at infinity, 2.7 Continuity, Continuity at a Point, 2.8 Business Application of Limit.
Specific Objectives	Contents
- Identify the rate change of a function at a particular point. - Find the derivative of algebraic, exponential, logarithmic, and trigonometric functions.	Unit 3: Derivative [6 Hrs.] 3.1 Derivative 3.2. Average rate of change 3.3. Derivative as a slope of the tangent to curves 3.4. Methods of differentiation (power rule sum rule, product rule, quotient rule and chain rule) 3.5 Differentiation of implicit and parametric functions 3.6 Derivative as a rate of change. Higher order derivatives.
Specific Objectives	Contents
- Establish the relationship between the derivative and concavity of the function. - Identify the increasing and decreasing function. - Find the maxima minima of a function, using the first and second-order derivative.	Unit 4: Application of Derivatives [6 Hrs.] 4.1. Increasing and decreasing functions 4.2. Critical point, Point of inflection 4.3. Maximum and minimum value of the function 4.4. Marginal analysis in Business and Economics 4.5. Concavity of the function, Marginal Profit Analysis 4.6. The mean value theorem, Optimization problem
Specific Objectives	Contents



• Use different Rules and techniques of integration to solve the related problems. • Identify the value of the function from the corresponding marginal value.	Unit 5: Integrals [6 Hrs.] 5.1 Indefinite Integral (algebraic, exponential, logarithmic, and trigonometric functions) 5.2 Techniques of Integration (Integration by simplification, Substitution method, Integration by parts) 5.3 Definite integral, 5.4 Properties of the definite integral
Specific Objectives	Contents
• Perform matrix operations and solve related problems • Evaluate the value of the determinant and use the concept of determinant for solving linear equations.	Unit 6: Matrices and Determinants [7 Hrs.] 6.1. Introduction 6.2. Types of matrices 6.3. Matrix operations 6.4. Transpose of a matrix, Determinant of a matrix, Minors, and cofactors of the matrix 6.5. Properties of determinants (Singular and non-singular matrix) 6.6. Solution of a system of linear equations having a unique solution of up to three variables (Cramer's rule).
Specific Objectives	Contents
• Identify the difference between permutation and combination. • Use the concept of permutations and combinations in real-life problems.	Unit VII: Permutations and Combinations [6 hrs] 7.1 Basic principles of counting, factorial notation, 7.2. permutation, Permutation of objects alike, 7.3. Permutation with restrictions, Circular permutation, 7.4 Combination, and Combination with restrictions.

5. Evaluation System and Student's Responsibilities

Evaluation System

In addition to the formal exam(s), the internal evaluation of a student may consist of quizzes, assignments, lab reports, projects, class participation, etc. The tabular presentation of the internal evaluation is as follows.



External Evaluation	Marks	Internal Evaluation	Weight	Marks
Semester-End examination	50	Theory		50
		Attendance & Class Participation	10%	
		Assignments	20%	
		Presentations/Quizzes	10%	
		Internal Assessment	60%	
Total External	50	Total Internal		50
Full Marks: 50 + 50 = 100				

6.Student's Requirement

Each student must secure at least 45% marks separately in both internal assessment and practical evaluation with 80% attendance in the class in order to appear in the Semester End Examination. Failing to get such a score will be given NOT QUALIFIED (NQ) to appear for the Semester-End Examinations. Students are advised to attend all the classes, formal exams, tests, etc., and complete all the assignments within the specified time period. ***Students are required to complete all the requirements defined for the completion of the course.***

7.Prescribed Books and References

Prescribed Books

1. Budnick, F. (2017). *Applied Mathematics for Business, Economics and the Social Sciences* (4 ed.). McGraw-Hill Higher Education.
2. Pahari, N. P., & Shrestha, R. M. (2013). *Fundamentals Of Mathematical Analysis* (1 ed.). Sukunda Pustak Bhawan.

References

1. Thomas, G. B., & Finney, R. L. (1995). *Calculus and Analytic Geometry* (9 ed.). Addison Wesley.



Pokhara University
Faculty of Management Studies

Course Code: CMP 171
Course title: **Fundamentals of Computer Systems**
Nature of the course: Theory + Practical
Year: First, Semester I
Level: Bachelor

Full marks: 100
Pass marks: 45
Credit Hrs: 3
Total periods: 48 hours
Program: BCSIT

1. Course Description

The course aims to provide a comprehensive understanding of computer systems, covering hardware-software interactions, operating systems, data communication, internet services, database management, multimedia, security, privacy, and current computing trends. The course includes study of computer components, CPU, memory, grasp data processing, interactions, software types, and system vs. application, enhance functionality, user experience OS functions, protection, installation multimedia, graphics, sound, image and demonstrate practical knowledge.

General Objectives

- To explore the historical evolution and significance of computers in modern society.
- To gain insight into computer hardware components, including CPUs, memory, storage, and I/O devices.
- To understand different types of software, such as operating systems and applications software.
- To examine the role of operating systems in managing hardware and user interactions.
- To learn about network protocols, transmission media, and architectures enabling seamless digital connectivity.
- To explore the structure, services, and transformative impact of the Internet on global communication and commerce.
- To acquire skills in designing, manipulating, and securing data using database management systems.
- To explore the world of multimedia, learn critical aspects of computer security and privacy, and gain insights into emerging technologies and their transformative impact on various industries.

3. Method of Instructions

General Instructional Technique: Lecture, Discussion, Readings, Question Answer

Specific Instructional Technique: Practical works, Project Based Learning, Self-Directed Learning, Industry Insights, Field Visit and Case Study

4. Content in Detail with Specific Objectives

Specific Objectives	Contents
▪ Explore computer's characteristics, history, and generational progression, highlighting their roles in modern society. ▪ Explain data representation and various computer applications across fields like business, communication, and research.	Unit 1: Introduction to Computer [6 Hrs.] 1.1 Introduction 1.2 Characteristics of Computer 1.3 History of Computing Devices 1.4 Generations of Computer 1.5 Classification of Computer 1.6 Data and Program Representation in Computer



	1.7 Applications of Computers
Specific Objectives	Contents
- Define digital computer components - ALU, CU, Memory, I/O. Illustrate functional block diagram, demonstrating their coordinated operation. - Explore into the significance of each component, their roles in data processing, and their collective contribution to overall computing.	Unit 2: Computer Hardware [4 Hrs.] 2.1 Introduction 2.2 Functional Block Diagram of Digital Computer System 2.2.1 ALU, CU, Memory Unit, Input and Output Units
Specific Objectives	Contents
- Differentiate between system (development, management) and application software (package, tailored), illustrating their vital roles. - Highlight software's diverse applications, from system control to tailored solutions addressing specific business needs.	Unit 3: Computer Software [2 Hrs.] 3.1 Introduction 3.2 Types of Software, (System Software (System Development, System Management), Application Software (Package, Tailored))
Specific Objectives	Contents
- Clarify OS objectives and types, including interactive, batch, real-time. Discuss their critical role in managing resources. - Detail OS functions - process, memory, file, device management, security, and user interface - driving efficient computing.	Unit 4: Operating System [6 Hrs.] 4.4 Introduction 4.5 Objective of Operating System 4.6 Types of OS 4.7 Functions of OS 4.8 Process Management 4.9 Memory Management 4.10 File Management 4.11 Device Management 4.12 Protection and Security) 4.13 User Interface
Specific Objectives	Contents
- Elaborate on communication media, modes (simplex, half-duplex, full-duplex), illustrating how networks facilitate information exchange. - Discuss various network types (LAN, WAN), topologies (star, mesh), and protocols (IP, TCP), crucial for modern interconnected systems.	Unit 5: Data Communication and Computer Network [5 Hrs.] 5.1 Introduction 5.2 Communication Media 5.3 Communication Mode 5.4 Computer Network 5.5 Advantage and disadvantage of Computer Network 5.6 Types of Networks 5.7 Network Topology 5.8 Communication Protocols (IP, TCP) 5.9 Networking Hardware
Specific Objectives	Contents



- Trace Internet's evolution, mechanics of data exchange via TCP/IP, and explain IP addressing and DNS systems. - Examine the structure of client-server architecture, key protocols (HTTP, SMTP, POP), and e-commerce, fostering global connectivity.	Unit 6: Internet and Internet Services [4 Hrs.] 6.1. Introduction 6.2. History of Internet 6.3. Working Mechanism of Internet 6.4. IP Address and Domain Name System (DNS) 6.5. Client-Server Architecture 6.6. Internet Protocols (HTTP, SMTP, POP, FTP, TELNET) 6.7. Static and Dynamic Web Pages 6.8. Search Engines 6.9. E-Commerce and M-Commerce 6.10. E-Governance
Specific Objectives	Contents
- Introduce databases and their attributes, highlight relational database management systems (RDBMS), and discuss data models. - Contrast databases with file systems, and reveal DBMS applications, underlining their pivotal role in efficient data management.	Unit 7: Database Management System [5 Hrs.] 7.1. Introduction to Database 7.2. Data Concepts and Characteristics 7.3. Database Vs. File System 7.4. Data Models 7.5. Database Management System 7.6. RDBMS 7.7. Database Applications
Specific Objectives	Contents
- Get insights into multimedia elements - graphics, sound, image formats, and how they compose immersive experiences. - Explore multimedia's applications, from web-based presentations to the emerging realms of augmented and virtual reality.	Unit 8: Multimedia [4 Hrs.] 8.1. Introduction 8.2. Elements of a multimedia system (Graphics, Sound, Image File Format) 8.3. Web Based Multimedia 8.4. Applications of Multimedia 8.5. Concept of Augmented and Virtual Reality.
Specific Objectives	Contents
- Address computer security concerns, access control mechanisms, unauthorized access prevention, and ethical considerations. - Explain countermeasures against software piracy, malware, and viruses, and delve into network security, encryption, and cyber law.	Unit 9: Computer Security and Privacy [6 Hrs.] 9.1. Computer Security 9.2. Access Control 9.3. Protecting Against Unauthorized Access 9.4. Software Piracy 9.5. Computer Viruses (Spyware, Malware, Ransom ware) 9.6. Anti-Virus 9.7. Ethical Issues 9.8. Cyber Law 9.9. Network Security 9.10. Hardware and Software Firewall 9.11. Data and Message Security 9.12. Encryption and Decryption



Specific Objectives	Contents
- Unpack contemporary trends: big data's impact, AI's applications, machine learning's growth, and the potential of cloud computing. - Introduce blockchain's decentralized paradigm, IoT's connected devices, and how GIS and BI empower data-driven decisions.	Unit 10: Current Trends in Computing [6 Hrs.] 10.1 Data Warehousing and Data Mining 10.2 Big Data 10.3 Data Science 10.4 Artificial Intelligence 10.5 Machine Learning 10.6 Cloud Computing 10.7 Block Chain Technology 10.8 Digital Marketing 10.9 Internet of Things 10.10 Geographical Information System 10.11 Business Intelligence

5. Laboratory Work

This unit encompasses hands-on tasks, from computer assembly to researching technology trends. Skills gained include word processing, spreadsheet manipulation, dynamic presentations, email management, operating system handling, file organization, and troubleshooting. Students develop practical proficiency and strategic insights for computer technology applications and future career planning.

- Hands-on lab tasks include building and disassembling a computer.
- Word Processing
Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Page Setup and Layout, references (Table of Content, Citation, Captions), Track Change.
- Spread Sheet
Basics of Spreadsheet; Manipulation of cells; Formulas and Functions (Math, Text, Statistical, LookUp), Pivot Table, Descriptive Analysis
- Presentation Tool
Hands-on lab tasks include creating and editing presentations, using templates and styles, and incorporating media and animation.
- Hands-on lab tasks include setting up and configuring email accounts, sending and receiving messages, and managing contacts.
- Hands-on lab tasks include installing and configuring an operating system, managing users and permissions, and troubleshooting common issues.
- Hands-on lab tasks include creating and organizing files and folders, using command line tools to navigate and manage files, and backing up and restoring data.
- Hands-on lab tasks include diagnosing and resolving common computer problems, performing regular maintenance tasks, and creating and restoring backups and remote login.
- Hands-on lab tasks include research and analysis of current and emerging trends in computer technology and the development of a career plan.

Note:

- Motivate students to create small project work integrating all of the above concepts.



2. Each of the above lab sessions should cover more than 4 hours of practical work.

6. Evaluation system and Student's Responsibility

In addition to the formal exam(s), the internal evaluation of a student may consist of quizzes, assignments, lab reports, projects, class participation, etc. The tabular presentation of the internal evaluation is as follows.

External Evaluation	Marks	Internal Evaluation	Weight	Marks
Semester-End examination	50	Theory		30
		Attendance & Class Participation	10%	
		Assignments	20%	
		Presentations/Quizzes	10%	
		Internal Assessment	60%	
		Practical		20
		Attendance & Class Participation	10%	
		Lab Report/Project Report	20%	
		Practical Exam/Project Work	40%	
		Viva	30%	
Total External	50	Total Internal		50
Full Marks: 50 + 50 = 100				

7. Student's Requirements

Each student must secure at least 45% marks separately in both internal assessment and practical evaluation with 80% attendance in the class in order to appear in the Semester End Examination. Failing to get such a score will be given NOT QUALIFIED (NQ) to appear in the Semester-End Examinations. Students are advised to attend all the classes, formal exams, tests, etc., and complete all the assignments within the specified time period. **Students are required to complete all the requirements defined for the completion of the course.**

8. Prescribed Books and References

Prescribed Text Books:

1. Thareja, R. (2019). *Fundamentals of computers*. Oxford University Press, USA.
2. Goel, A. (2010). *Computer Fundamentals*. Pearson Education India.

Reference Books:

1. Stallings, W., & Brown, L. (2018). *Computer security: Principles and Practice*. Pearson.
2. Norton. (2010). *Introduction To Computers (Sie)*. Tata McGraw-Hill Education.
3. Sinha, P. K., & Sinha, P. (2004). *Computer Fundamentals*. BPB publications.
4. Han, J., & Kamber, M. (2012). *Data mining: Concepts and Techniques*. Morgan Kaufmann.
5. Sosinsky, B. (2011). *Cloud Computing Bible*. John Wiley & Sons.



Pokhara University
Faculty of Management Studies

Course Code: CMP 173
Course title: **Internet Technology**
Nature of the course: Theory + Practical
Year: First, Semester I
Level: Bachelor

Full marks: 100
Pass marks: 45
Credit: 3Hrs
Total periods: 48 hours
Program: BCSIT

1. Course Description

This course introduces students to web technologies, encompassing HTML, CSS, and JavaScript. Students learn web basics, HTML structure, CSS styling, JavaScript programming, and advanced topics. The course emphasizes responsive design, DOM manipulation, asynchronous programming, and practical implementations. Practical sets reinforce skills in creating web content, styling layouts, and enhancing interactivity, culminating in a website project. The course includes understanding the fundamental concepts of web technology, including the Internet, Intranet, and World Wide Web (WWW), and demonstrating proficiency in designing and structuring web content using HTML, creating both static and dynamic web pages. The course explores advanced JavaScript topics, including scope, closures, error handling, DOM manipulation, and asynchronous programming, and develops hands-on experience by creating interactive web interfaces and responsive layouts through practical exercises.

2. General Objectives

- To understand the core concepts of web technology, including the Internet, Intranet, and World Wide Web (WWW).
- To acquire proficiency in designing and structuring web content using HTML, encompassing static and dynamic pages.
- To develop expertise in applying CSS for styling and layout, including typography, colors, backgrounds, and responsive design.
- To master the principles of client-side scripting with JavaScript, covering variables, control flow, functions, arrays, and objects.
- To explore advanced JavaScript topics, including scope, closures, error handling, DOM manipulation, and asynchronous programming.
- To gain hands-on experience with practical exercises to create interactive web interfaces and responsive layouts.
- To apply best practices in coding, optimization, and organization to enhance web development efficiency and performance.
- To cultivate a foundation in modern web technologies, enabling the creation of dynamic and engaging web applications.

3. Method of Instructions

General Instructional Technique: Lecture, Discussion, Readings, Question Answer



Specific Instructional Technique: Practical works, Project Based Learning, Self-Directed Learning, Industry Insights and Case Study

4. Content in Detail with Specific Objectives

Specific Objectives	Contents
- Explore internet essentials, differentiating between Internet, Intranet, and World Wide Web (WWW). - Distinguish between static and dynamic web pages, and comprehend the roles of web clients and servers. - Grasp the fundamentals of client-server architecture, including single-tier, two-tier, and multi-tier models. - Gain insight into HTTP, understanding request and response processes, and interpreting URLs. - Differentiate client-side scripting from server-side scripting, and recognize their significance in web development. - Trace the evolution of the web from Web 1.0 to Web 3.0, and understand the evolving nature of internet technologies.	Unit I: Introduction to web technology [3 Hrs.] 1.1 Web Basics: 1.1.1 Internet, Intranet, WWW 1.1.2 Static and Dynamic Web Page 1.1.3 Web Clients 1.1.4 Web Servers 1.2 Client Server Architecture: 1.2.1 Single Tier 1.2.2 Two-Tier 1.2.3 Multi-Tier; 1.3 HTTP: HTTP Request and Response 1.4 URL 1.5 Client Side Scripting 1.6 Server Side Scripting 1.7 Web 1.0, Web 2.0 and web 3.0
Specific Objectives	Contents
- Understand HTML's role in web development and its key components. - Comprehend the basic structure of HTML documents, including head and body sections. - Identify and use tags, elements, and attributes within HTML. - Apply proper HTML doctype declaration for consistent rendering. - Utilize meta tags to specify character encoding, viewport, and other metadata. - Format content using heading, paragraph, strong, em, underline, and strikethrough tags. - Implement line breaks, and horizontal rules, and create hyperlinks with anchor tags. - Establish navigation menus, and lists, and organize content effectively. - Insert images and multimedia elements, setting attributes like src, alt, width, and height. - Construct tables, including headers, data cells, merging cells, and adding captions. - Create interactive forms with input elements, validate user input, and handle form submission.	Unit 2: Hyper Text Markup Language [8 Hrs.] 2.1 Introduction to HTML 2.2 Document Structure 2.3 Text Formatting 2.4 Links and Navigation 2.5 Hyperlink 2.6 Images and Multimedia 2.7 Lists, Tables, Forms and Input 2.8 Semantic HTML



Specific Objectives	Contents
● Create graphics using the HTML5 canvas element. ● Explore new form input types, including email, URL, date, time, and range. ● Master form validation using built-in attributes and placeholder text. ● Adhere to proper code indentation, formatting, and consistent naming conventions.	Unit 3: HTML5 [7 Hrs.] 3.1 HTML5 APIs 3.2 HTML5 Forms 3.3 Responsive Web Design 3.4 HTML5 3.5 Semantic Markup 3.6 Best Practices and Optimization
Specific Objectives	Contents
● Understand CSS's role in web development and its syntax. ● Apply CSS rules inline, internally, and externally. ● Master various CSS selectors, including elements, classes, IDs, and pseudo-classes. ● Grasp the concept of the box model, dimensions, and box-sizing property. ● Style typography with fonts, sizes, colors, alignment, and decorations. ● Apply diverse color formats and configure backgrounds with images and properties. ● Control element positioning using static, relative, absolute, and fixed positioning. ● Implement floating elements and handle clearing and clearfix techniques. ● Utilize display property for versatile element presentation. ● Acquire skills in creating layouts and enhancing webpage aesthetics with CSS. ● Understand viewport Meta tags for responsive design. ● Implement media queries for diverse screen sizes and responsiveness. ● Design responsive layouts using CSS for optimal viewing on various	Unit 4: Cascading Style Sheets [8 Hrs.] 4.1 Introduction to CSS 4.2 CSS syntax 4.3 Using CSS with HTML 4.4 CSS Selectors 4.5 CSS Comments 4.6 CSS Properties 4.6.1 Backgrounds 4.6.2 Border, Margin 4.6.3 Padding 4.6.4 Height 4.6.5 width 4.6.6 color(color wheel) 4.7 Text 4.8 Font 4.9 Alignment 4.10 Line Height 4.11 Box Model 4.12 working with images 4.13 Layout and Positioning 4.14 Media query 4.15 CSS website Layout
Specific Objectives	Contents
● Develop advanced proficiency in CSS, covering flexbox, grid layouts, transitions, animations, responsiveness, specificity, units, preprocessors, and optimization. ● Master CSS Flexbox and Grid for versatile layout control. ● Apply transitions and animations using various properties and keyframes. ● Create responsive designs using media queries,	Unit 5: Advance Topics on CSS [7 Hrs.] 5.1 CSS Flexbox 5.2 CSS Grid 5.3 CSS Transitions and Animations 5.4 Responsive Web Design 5.5 CSS Specificity and Inheritance 5.6 CSS Units and Values 5.7 CSS Preprocessors 5.8 CSS Best Practices and



breakpoints, and the mobile-first approach. • Understand CSS specificity and inheritance principles for effective styling. • Utilize different CSS units and values, including relative and absolute units. • Explore CSS preprocessors, employing nesting, variables, mixins, and functions. • Implement CSS best practices, including efficient organization, vendor prefixes, and optimization techniques. • Enhance web development skills with advanced CSS techniques.	Optimization
Specific Objectives	Contents
• Understand JavaScript's role in web development and its syntax. • Declare variables and utilize data types: numbers, strings, Booleans, null, undefined, objects, and arrays. • Apply arithmetic, comparison, and logical operators to manipulate data. • Implement control flow through if statements, switch statements, and ternary operators. • Utilize loops such as while, for, and do-while for iterative processes. • Define, call, and manage functions, including parameters, arguments, and return values. • Create and manipulate arrays, using methods like push, pop, shift, unshift, splice, slice, and iteration techniques. • Work with objects, access properties, employ methods, and understand object constructors and prototypes. • Develop practical client-side scripting skills using JavaScript to enhance web interactivity and functionality.	Unit 6: Client Side Scripting with JavaScript [8 Hrs.] 6.1 Introduction to JavaScript 6.2 Using JS in HTML 6.3 JavaScript Output 6.4 JavaScript Comments 6.5 Variables and Data Types 6.6 Operators and Expressions 6.7 Control Flow and Conditionals 6.8 Loops 6.9 Functions 6.10 Arrays 6.11 Objects
Specific Objectives	Contents
• Grasp the intricacies of scope, variable visibility, and the concept of closures. • Manage errors using try-catch blocks, exceptions, and employ debugging techniques. • Manipulate the Document Object Model (DOM) to interact with HTML elements and handle events. • Master asynchronous programming, including callback functions, promises, and async/await. • Work with JSON data and make AJAX requests using fetch API or XMLHttpRequest. • Explore ES6 features like arrow functions, template	Unit 7: Advance Topics on JavaScripts [7 Hrs.] 7.1 Scope and Closures 7.2 Error Handling and Debugging 7.3 DOM Manipulation 7.4 Asynchronous JavaScript 7.5 JSON and AJAX 7.6 ES6 and Modern JavaScript 7.7 JavaScript Libraries



literals, let and const keywords, and destructuring assignments. • Understand modern JavaScript concepts, such as modules and import/export functionality. • Gain optional exposure to popular JavaScript libraries/frameworks like React, Angular, or Vue.js for building web applications. • Elevate your JavaScript skills to enable dynamic and interactive web development.	
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5. Laboratory Work

It builds the foundation for how to write a program using any high-level language. Hence, this course requires a lot of programming practice so that students will be able to develop good logic building and program developing capability which is essential throughout the course.

Some important contents that should be included in lab exercises are as follows:

1. Creating a simple static web site with 4 pages, using HTML5 (include all tags included in HTML and HTML 5)
2. Create a simple image gallery using CSS
3. Create a responsive web page using box model
4. Create a form with all the elements and validate it using client-side scripting
5. Using JavaScript create a simple calculator
6. Create a user registration form using HTML 5 and validate it using JavaScript
7. Creating jQuery Slider and Image Gallery
8. Use jQuery date picker and sort
9. Work with JSON data and make AJAX requests using fetch API or XMLHttpRequest
10. General concept of React, Angular, or Vue.js for building web applications

Note:

1. Motivate students to create small project work integrating all of the above concepts.
2. Each of the above lab session should cover more than 4 hours of practical work.

6. Evaluation system and Student's Responsibility

In addition to the formal exam(s), the internal evaluation of a student may consist of quizzes, assignments, lab reports, projects, class participation, etc. The tabular presentation of the internal evaluation is as follows.

External Evaluation	Marks	Internal Evaluation	Weight	Marks
Semester-End examination	50	Theory		30
		Attendance & Class Participation	10%	
		Assignments	20%	
		Presentations/Quizzes	10%	
		Internal Assessment	60%	
		Practical		20
		Attendance & Class Participation	10%	



		Lab Report/Project Report	20%	
		Practical Exam/Project Work	40%	
		Viva	30%	
Total External	50	Total Internal		50
Full Marks: 50 + 50 = 100				

7. Student's Requirements

Each student must secure at least 45% marks separately in both internal assessment and practical evaluation with 80% attendance in the class in order to appear in the Semester End Examination. Failing to get such a score will be given NOT QUALIFIED (NQ) to appear in the Semester-End Examinations. Students are advised to attend all the classes, formal exams, tests, etc., and complete all the assignments within the specified time period. ***Students are required to complete all the requirements defined for the completion of the course.***

8. Prescribed Books and References

Prescribed Text Books:

1. Robbins, J. N. (2018). *Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics*. O'Reilly Media.

Reference Books:

1. Holzner, S. (2000). *HTML Black Book*. John Wiley & Sons.
2. Inc, K. L. S. (2009). *Web Technologies: Html, Javascript, Php, Java, Jsp, Asp.Net, Xml And Ajax, Black Book (With Cd)*. Wiley India
3. Knuckles. (2006). *Web Applications: Concepts & Real World Design*. John Wiley & Sons.
4. Deitel, P. J., Deitel, H. M., & Deitel, A. (2012). *Internet and world wide web: How to Program*. Prentice Hall.



Pokhara University
Faculty of Management Studies

Course Code: CMP 172
Course title: **Programming Language**
Nature of the course: Theory + Practical
Year: First, Semester I
Level: Bachelor

Full marks: 100
Pass marks: 45
Credit: 3Hrs
Total periods: 48 hours
Program: BCSIT

1. Course Description

This course is designed to provide students with a comprehensive understanding of computer programming using the C language. Students will develop essential programming skills, ranging from foundational concepts to advanced techniques, enabling them to create efficient, reliable, and maintainable software applications. Through hands-on exercises, coding projects, and problem-solving activities, students will gain practical experience in writing, debugging, and optimizing C programs. The course includes developing the ability to analyze, design, implement, debug, and comprehensively document code within the C programming language. Likewise attaining mastery over pivotal programming concepts in C, encompassing data manipulation and conditional logic. Proficiently employ statements and logical structures for decision-making and program control. Elevate C programming prowess by effectively manipulating arrays and strings, harnessing library functions, crafting custom functions, managing prototypes, and controlling variable scope. Achieving mastery in essential data management skills within C programming, spanning diverse structures, memory optimization, and adept utilization of pointers to enhance efficiency.

2. General Objectives

- To understand the basic principles and concepts of computer programming.
- To gain proficiency in writing C programs and applying programming constructs.
- To develop problem-solving and logic building skills through programming exercises.
- To acquire knowledge of fundamental data structures and their implementation in C.
- To learn how to design and implement algorithms using C programming.
- To apply programming concepts and C programming skills to solve real-world problems.

3. Method of Instructions

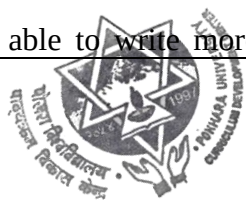
General Instructional Technique: Lecture, Discussion, Readings, Question Answer
Specific Instructional Technique: Practical works, Project Based Learning, Self-Directed Learning, Industry Insights and Case Study.

4. Content in Detail with Specific Objectives

Specific Objectives	Content
▪ To offer students a comprehensive understanding of the C programming language, including its historical context, problem-solving skills, coding techniques, debugging strategies, and best practices for testing and documenting code.	Unit 1: Problem Solving with Computer [6 Hrs.] 1.1 Problem analysis 1.2 Algorithms and Flowchart 1.3 History of C 1.4 Structure of C program 1.4.1 Debugging 1.4.2 Compiling a C program



These objectives collectively contribute to building a solid foundation in C programming.	1.4.3 Executing a C program 1.5 Testing and Documentation 1.6 Preprocessor and Macros
Specific Objectives	Content
- To provide student with a strong foundation in the essential elements of the C programming language. - To student will gain proficiency in constructing C code, manipulating data, and understanding the fundamental building blocks of C programs.	Unit 2: Elements of C [2 Hrs.] 2.1 C Character Set 2.2 Tokens 2.3 Escape sequence 2.4 Variables Declaration and Initialization 2.5 Data types 2.5.1 Basic, Derived, and User Defined 2.6 Constants/ Literals 2.7 Expressions 2.8 Statements 2.9 Comments
Specific Objectives	Content
- To equip learners with the skills necessary to effectively read and write data in C programs. - To learners will be able to interact with users, handle input data, and present output results in a controlled and organized manner.	Unit 3: Input and Output [2 Hrs.] 3.1 Unformatted and Formatted I/O 3.2 Conversion specifier 3.3 Character Input and Output 3.5 I/O operations
Specific Objectives	Content
- To learners with a deep understanding of various operators and their usage in C programming. - To learners will be able to manipulate data, create complex conditions, and optimize code for efficient execution.	Unit 4: Operators and Expression [4 Hrs.] 4.1 Operator, Operand and Expression 4.2 Types of Operators 4.2.1 Arithmetic operator 4.2.2 Relational operator 4.2.3 Logical or Boolean operator 4.2.4 Assignment Operator 4.2.5 Bitwise operator 4.2.6 Prefix and Postfix Increment and Decrement operator 4.2.7 Ternary operator 4.2.8 Special Operators (size of and comma) 4.3 Evaluation of Expression 4.4 Operator Precedence and Associativity
Specific Objectives	Content
- To provide learners with the skills to control program execution flow based on conditions, implement looping mechanisms for repetitive tasks, and manage loops with break and continue statements. - To learners will be able to write more	Unit 5: Control Statement [8 Hrs.] 5.1 Introduction to Control Structure 5.2 Sequential Control Statement 5.3 Decision Making Statement 5.3.1 if, if else, if else if, nested if and switch case 5.4 Iteration (Loop) Statement



dynamic and efficient programs that can adapt to different scenarios and perform iterative actions	5.4.1 for, while, do while, nested loops 5.5 Break and Continue statement
Specific Objectives	Content
- To provide learners with a solid understanding of arrays and strings in C programming - To learners will be able to store and process data using arrays, effectively handle textual information through strings, and utilize string library functions for various string operations	Unit 6: Arrays and string [6 Hrs.] 6.1 Introduction to Array 6.2 Declaration 6.3 Memory Representation of Array 6.4 Initialization of Array 6.5 Types of Arrays 6.5.1 Single Dimensional and Multidimensional 6.7 Character Array and Strings 6.8 Reading and Writing Strings 6.9 Null Character 6.10 Library Functions for String handling
Specific Objectives	Content
To equip learners with the skills to create modular, organized, and efficient programs using functions, while also understanding how variable scope and lifetime influence data management and program structure.	Unit 7: Functions [6 Hrs.] 7.1 Introduction to Functions 7.2 Types of Functions 7.2.1 Library Functions 7.2.2 User defined functions) 7.3 Components of Functions 7.3.1 Function prototype 7.3.2 Function call 7.3.3 Function Definition 7.4 Function Arguments and Return Types 7.5 Passing Arrays to Function 7.6 Passing Strings to Function 7.7 Storage Class (auto, register, static, extern) 7.8 Scope of Variables (Local and Global) 7.9 Recursive Function
Specific Objectives	Content
To declare, manipulate, and utilize pointers effectively, understand pointer arithmetic, work with arrays and character strings, use pointers as function arguments, and implement dynamic memory allocation.	Unit 8: Pointers[4hrs] 8.1 Introduction 8.2 The & and * operator, 8.3 Declaration of pointer 8.4 Chain of Pointers 8.5 Pointer Arithmetic 8.6 Pointers and Arrays 8.7 Pointers and Character Strings 8.8 Array of Pointers 8.9 Pointers as Function Arguments 8.10 Dynamic Memory Allocation 8.10.1 malloc() 8.10.2 calloc()



	8.10.3 realloc() 8.10.4 free() 8.11 Pass by value, Pass by reference
Specific Objectives	Content
- To provide learners with a deeper understanding of advanced data structures and their usage in C programming - To organize and manage complex data, efficiently pass and manipulate structured data within functions, and use pointers to navigate and modify structure instances	Unit 9: Structure and Union [4 Hrs.] 9.1 Introduction 9.2 Declaration and Initialization of Structure and 9.3 Structure Variable 9.4 Array of structure 9.5 Passing structure to function 9.6 Passing array of structure to function 9.7 Nested Structure 9.8 Pointer to structure 9.10 Union vs Structure
Specific Objectives	Content
- To read data from external files or write data to files as a means of input/output operations. - To store and retrieve information persistently, allowing data to be preserved even after the program terminates.	Unit 10: File Handling[6hrs] 10.1 Concept of File 10.2 File Operation Modes 10.3 Opening and Closing of File 10.4 Input Output Operations in File 10.5 Random access in File

5.Laboratory Work

It builds the foundation on how to write a program using any high-level language. Hence, this course requires a lot of programming practice so that students will be able to develop good logic building and program developing capability which is essential throughout the course.

Some important contents that should be included in lab exercises are as follows:

1. Introduction to C Programming – basic structure of C program.
2. To illustrate the use of Input, Output, Variable and Constants.
3. To illustrate the different operators-Arithmetic, Relational and Logical Operators in C.
4. To illustration of Control Structures (decision making) and processor directives.
5. To illustration of Control Structures (looping).
6. To illustrate the function programming- simple and recursive functions.
7. To illustrate the concept of Pointer and String.
8. To illustrate the function programming- Call by value vs. call by reference.
9. To illustrate the concept of Structure.
10. To illustrate the different file operations.

Note:

1. Motivate students to create small project work integrating all of the above concepts.
2. Each of the above lab session should cover more than 4 hours of practical work.



6. Evaluation system and Student's Responsibilities

Evaluation System

In addition to the formal exam(s), the internal evaluation of a student may consist of quizzes, assignments, lab reports, projects, class participation, etc. The tabular presentation of the internal evaluation is as follows.

External Evaluation	Marks	Internal Evaluation	Weight	Marks
Semester-End examination	50	Theory		30
		Attendance & Class Participation	10%	
		Assignments	20%	
		Presentations/Quizzes	10%	
		Internal Assessment	60%	
		Practical		20
		Attendance & Class Participation	10%	
		Lab Report/Project Report	20%	
		Practical Exam/Project Work	40%	
		Viva	30%	
Total External	50	Total Internal		50
Full Marks: 50 + 50 = 100				

7. Student's Requirements

Each student must secure at least 45% marks separately in both internal assessment and practical evaluation with 80% attendance in the class in order to appear in the Semester End Examination. Failing to get such a score will be given NOT QUALIFIED (NQ) to appear in the Semester-End Examinations. Students are advised to attend all the classes, formal exams, tests, etc., and complete all the assignments within the specified time period.

Students are required to complete all the requirements defined for the completion of the courses.

8. Prescribed Books and References

Prescribed Text Books:

1. Srivastava. (2009). *C - In Depth - 2Nd Revised Edition*. BPB Publications.
2. Kanetkar, Y. P. (2006). *Let us c*. BPB Publications.

Reference Books:

1. Balagurusamy, E. (2019). *Programming In Ansi C, 8Th Edition*. MC Graw Hill India.
2. Gottfried, B. S. (1996). *Programming with C Ind Adap ed*. Tata McGraw-Hill Education.
3. Deitel, P. J., & Deitel, H. M. (2016). *C: How to Program*. Prentice Hall.
4. Kelley, A., & Pohl, I. (1998). *A book on c: Programming in C*. Addison-Wesley Professional.
5. Mittal, A. (2010). *Programming In C: A Practical Approach*. Pearson Education India.

