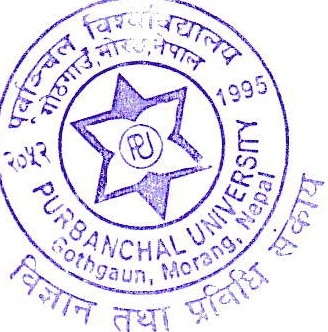


BACHELOR OF COMPUTER APPLICATION (BCA)



PURBANHAL UNIVERSITY (FACULTY OF SOENCE AND TECHNOLOGY)

BIRATNAGAR, NEPAL



REGULATIONS GOVERNING BCA PROGRAM

1. TITLE OF PROGRAM:

The programme shall be called BACHELOR OF COMPUTER APPLICATION (BCA).

1. ELIGIBILITY FOR ADMISSION:

Students seeking admission in BCA program:

* 1. Should have successfully completed twelve years of schooling in any stream.
  2. Should have achieved minimum D+ grade in each subject of grade 11 and 12 with CGPA 2.0 or more

or

Should have secured a minimum score of second division (45%) marks in 10+2, PCL or equivalent in any discipline.

Students who have passed grade 11 and are waiting for supplementary exam (PURAK PARIKSHA) of grade 12 can also apply. However, they have to submit all the required documents at the time of admission.

Students who appeared in the final exam and are waiting for the result and certificates can also apply for the entrance examination. However, they have to submit all the required documents at the time of admission.

* 1. In case of foreign certificate, student should submit equivalence certificate and each subject grading with CGPA or total percentage document from concerned authority.
  2. Should pass entrance examination as conducted by Purbanchal University.

1. DURATION OF THE PROGRAM:

The program of study shall extend over a period of eight semesters (FOUR ACADEMIC YEARS).

1. MEDIUM:

ENGLISH shall be the medium of instruction and examination in all the subjects of BCA Program.

1. ATTENDANCE REQUIREMENT:

A student must achieve, at least 80% attendance of lectures, tests, and tutorial classes in order to qualify for sitting for the final examination of any subject.

There are no unauthorized cuts from classes; persistent poor attendance may result m exclusion from classes.



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In the case of unavoidable absence such as for illness of the student or serious illness or death of a member of the family or similar compelling reasons for absence, all works missed must be satisfactorily made up and the responsibility for making up this work rests with the concerned students.

Teachers should also help them in making up this work.

1. EVALUATION PROCEDURES:
2. CONTINUOUS ASSESSMENT

All courses undertaken by students are evaluated during semester using an internal system of continuous assessment.

The student is evaluated on class and/or tutorial participation, assignment work, laboratory work, class tests and quizzes that contribute to the final grade awarded for the subject.

Students will be notified at the commencement of each course about the evaluation methods to be used for the course and the weightage given to the different assignments and evaluation activities.

1. COMBINED THEORYAND LABORATORY/PRACTICAL COURSES:

Some of the courses have combined theory and laboratory/practical portions. For these courses marks will be awarded as follows: 20% Internal Marks, 20% Practical Marks, 60% Final Examination Marks.

The type of each course is indicated in the following course descriptions.

1. THEORY:

The pure theory course marks will be awarded as follows:

20% Internal Marks and 80% Final Examination Marks.

1. LABORATORY:

The pure laboratory or practical course marks will be awarded as follows:

60% from continuous internal evaluation, 40% from final viva to be evaluated by the University.

1. END-SEMESTER EXAMINATION:

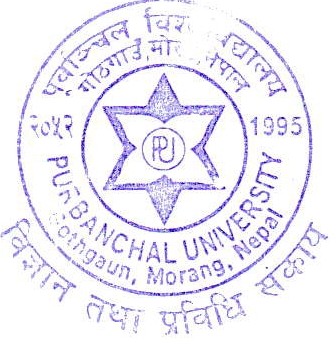
The examination at the end of the semester is set and evaluated by examiners.

1. OBJECTIVE OF SEMESTER COMPUTER PROJECTS:

The concepts of project work will begin in the first semester and it will continue in the last Seven semesters. Students will be expected to apply the theory and principles they have learned from other courses in a practical way in order to complete a project each semester. They will develop skills in goal setting, planning, research, team work, implementation, assessment, report writing and presentation is they work on their chosen project.

Student will work in a group of upto three students under the guidance of group adviser. The group will decide on a project and set out their aims and objectives.



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1. EVALUATIONS AND GRADING SYSTEM:

The performance of students is evaluated through a system of continuous testing spread over the entire period of study. At the end of each semester, students are awarded letter grades based on grades and marks obtained in various segments of the course evaluation.

In students rating eight grades A+,A,B+, B, C, D ,F and I.are used.

Letter grades are used to show the academic standing of a student, with the following values, equivalent marks % and remarks:

|  |  |  |  |
| --- | --- | --- | --- |
| EQUIVALENT MARKS% | LETTER GRADE | GRADE VALUE | REMARKS |
| 90 and Above | A+ | 4.00 |  |
| 80 and Below 90 | A | 3.75 |  |
| 70 and Below 80 | B+ | 3.50 |  |
| 60 and Below 70 | B | 3.00 |  |
| 50 and Below 60 | C | 2.50 |  |
| 40 and Belo"v 50 | D | 1.75 |  |
| Below 40 | F | 0.00 | Fail |
| Not Qualified(NQ)/Absent | I | - | Incomplete |

If a student fails to submit term paper, report, home assignment and laboratory assignment, which are requirements of a course, the teacher concerned may allow him the benefit of an "Incomplete." A student who is awarded as "Incomplete" in any course can get it removed within six weeks from the end of the semester. If the requirements are not met within this time limit, the student's grade in that course is converted into "Fail." On completion of the course, however, the student does not receive any further grade but is allowed the benefit of the numerical grade point weight of an "Incomplete."

1. **CUMULATIVE GRADE POINT AVERAGE (CGPA)**

A Cumulative Grade Point Average (CGPA) , Which is the grade point average of all the semesters, is computed at the end of the course for all students. Final later grades in each course are converted into grade points on the following basis:

A+------------------------------------------- 4.00 grade points

A---------------------------------------------3.75 grade points

B+ 3.50 grade points

B 3.00 grade points

C 2.50 grade points

D 1.75 grade points

F----------------------------------------------0.00 grade points

As the student complete different course, these points are accumulated and an average point score for each student called the CGPA in maintained.

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The CGPA shall be calculated using the for fonnula: I(Credit hoursXGrade points)

CGPA=

L(Credit hours)

A student must maintain a CGPA of 2.0 or above throughout the study period. The student failing to maintain the CGPA of 2.0 may be required to withdraw from the program.

## SCOPE FO FURTHER STUDIES:

After accomplishing this course, the student can enroll for graduate degree such as:

Master of Computer Application Maser oflnformation Technology

Master of Science in Computer Science

Master of Science in Computer Information Systems Master of Business Administration



##### THE DISTRIBUTION OF COURSE SHALL BE AS FOLLOWS:

Year:I Semester:!

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Course Code | Course Title | Credits | Lecture (Hrs.) | Tutorial (Hrs.) | Laborator y  (Hrs.) | Total (Hrs.) |
| BCA101C  0 | Computer System  Concepts | 3 | 3 | 1 | 2 | 6 |
| BCA102HS | Mathematics-I | 3 | 3 | 1 | - | 4 |
| BCA103HS | Technical English | 3 | 3 | 1 | - | 4 |
| BCA104C  0 | Computer  programming in C | 3 | 3 | 1 | 2 | 6 |
| BCA105C  0 | Digital Logic | 3 | 3 | 1 | 2 | 6 |
| BCA106C  0 | Computer  Prnject-1 | 2 |  |  | 3 | 3 |
|  | Totlll | 17 | 15 | 6 | 9 | 30 |

Year:I **Semester:11**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Course**  Code | Course Title | Credits | **Lecture (Hrs.)** | **Tutorial (Hrs.)** | **Laboratory (Hrs.)** | **Total**  (Hrs.) |
| **BCA151HS** | Mathematics-II | 3 | 3 | **2** | - | 5 |
| **BCA152MS** | Modern Business  Practices | 3 | 3 | **1** |  | **4** |
| **BCA153CO** | Microprocessor  **and** Assembly  Language | 3 | 3 | **1** | **2** | 6 |
| **BCA154CO** | Object-Oriented  Pro\!\_ramminl! | 3 | 3 | 1 | 2 | 6 |
| **BCA155HS** | SoritJlogy, Ethics  a11d Emotional Intellil,!cnce | 3 | 3 | **1** | - | **4** |
| **BCA156CO** | Computcr Project-  If | 2 | - | - | 3 | 3 |
|  | Tola! | 17 | **15** | 6 | 7 | **28** |





Year:11 **Semester:!**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | Course Title | **Credits** | **Lecture (Hrs.)** | **Tutorial (Hrs.)** | **Laboratory (Hrs.)** | **Total (Hrs.)** |
| **BCA201MS** | Financi;ll  Accounting | 3 | 3 | **1** | **1** | **5** |
| **BCA202CO** | Computer  Architecture | 3 | 3 | **1** |  | 4 |
| **BCA203CO** | **Data** Structure **and**  Alg,orithm | 3 | 3 | **1** | **2** | **6** |
| **BCA204CO** | 'stem Analysis and Ocsi n | 3 | 3 | **1** | - | 4 |
| **BCA205CO** | U,;-:r I1.tcrface  D('t..:i 1n | 3 | 3 | **1** | **2** | **6** |
| **BCA206CO** | C<,-n;,u:cr Project-  Ill | 2 | - | - | 3 | 3 |
|  | Tot:!I | **17** | **15** | **5** | **8** | **26** |

**Year:11** Semester:11

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | C',\11".\l'  Ti!:l' | | | | | | **Credits** | **Lecture (Hrs.)** | **Tutorial (Hrs.)** | **Laboratory (Hrs.)** | **Total (Hrs.)** |
| **BCA251MS** | Tl'rlinology and  ptr:itions  i\l•i:; ]"1.'lllCllt | | | | | | 3 | 3 | **1** | - | **4** |
| **BCA252CO** | j :1111,·riral  I ll't ,.,,1-; | | | | |  | 3 | 3 | **1** | **2** | **6** |
| **BCA253CO** | (; | h | - | ., ing System | | | 3 | 3 | **1** | **2** | 6 |
| **BCA254CO** | C | | | .iler Network | | | 3 | 3 | **1** | **2** | 6 |
| **BCA255CO** | ])a,;<basc  l\!'i ; ·mcnt  s -.,- | | | | | | 3 | 3 | **1** | **2** | 6 |
| **BCA256CO** | *C* •I  I.' | | | | t'r roject- | | 2 | - | - | 3 | **3** |
|  | T |  |  |  | | | **17** | **15** | **5** | **11** | **31** |





Year:111 Semester:!

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Course Code | Course  Tilie | | Credits | Lecture (Hrs.) | Tutorial  **(Hrs.)** | Laboratory (Hrs.) | Total  **(Hrs.)** |
| BCA301HS | Probability and  Statistics | | 3 | 3 | 1 | **1** | 5 |
| BCA302CO | i\lanagcment I II formation  S.\Sll'lll | | 3 | 3 | 1 | - | 4 |
| BCA303CO | t Oriented  \_1·sis and  *I. •* 'II | | 3 | 3 | 1 | - | 4 |
| BCA304CO | -- | ·,-l'dtnology | 3 | 3 | 1 | 2 | 6 |
| BCA305CO | ..-.. | nkr | 3 | 3 | 1 | 2 | 6 |
| t:r  .*C* | des |  |  |  |  |  |
| BCA306CO | 11"cr Project- | 2 | - | - | 3 | 3 |
|  |  |  |  |  |  |
|  | ' - |  |  |  |  |
|  |  |  | 17 | 15 | 5 | 8 | 28 |

Year:111 Semester:11

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BCA356CO

BCA355CO

BCA354CO

BCA353CO

BCA352CO

BCA351HS

Course Code

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Credits | Lecture (Hrs.) | Tutorial (Hrs.) | Laboratory (Hrs.) | Total (Hrs.) |
| l  ,logy | 3 | 3 | 1 | - | 4 |
| ·c  ring | 3 | 3 | 1 |  | 4 |
| t:curity | 3 | 3 | l | 2 | 6 |
| c Object  I  · iming | 3 | 3 | l | 2 | 6 |
| i  ce | 3 | 3 | 1 | 2 | 6 |
| er Project- | 2 | - | - | 3 | 3 |
|  | 17 | 15 | 5 | 7 | 27 |





Year:IV **Semester:!**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | Course  T;·•c | Credits | Lecture  **(Hrs.)** | **Tutorial (Hrs.)** | **Laboratory (Hrs.)** | **Total (Hrs.)** |
| **BCA401CO** | r1· in Banking | 3 | 3 | **1** | 2 | 6 |
| **BCA4\*\*** | :.,,Tialization-1 | 3 |  |  |  |  |
| **BCA4\*\*** | s,,•·l·ialization-2 | 3 |  |  |  |  |
| **BCA4\*\*** | Spn:ialization-3 | 3 |  |  |  |  |
| **BCA402CO** | !1.,t.:rnship | 3 |  |  |  |  |
|  | i | **15** |  |  |  |  |

**Year:IV Semester:II**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | C -c  i, .plion | | Credits | **Lecture (Hrs.)** | **Tutorial (Hrs.)** | **Laboratory (Hrs.)** | **Total (Hrs.)** |
| **BCA451CO** | ,.. ,1e Learning  ,\_-·j ·vthon  --- -  izalion-4 | | 3 | 3 | 1 | **2** | 6 |
| **BCA4\*\*** | 3 |  |  |  |  |
| **BCA4\*\*** |  | lization-5 | 3 |  |  |  |  |
| **BCA4\*\*** | ,. · : dization-6 | | 3 |  |  |  |  |
| **BCA452CO** | ·11tire Project | | 6 |  |  |  | 6 |
|  |  |  | **18** |  |  |  |  |

**\*\*Specializalit:'1**1 •·ea:

Specialization *:* · · 1 cours s have been designed in three major areas for in-depth knowledge in the area. Students , ·lc1p :;pc ialized expertise in their specialization area. Students are required to

take six speci:1' ,· m courses, three courses each in seventh and eighth semester, from a selected

area. Currently. :i·ree specialization areas (Information System Management, Networking and Cloud Computi .:,",md Digital Commerce and Business Analytics) are offered to the students.

1. Inform-·:-::,n Syste Management

Year :IV -,nd Semester :I ( Specialization **1, Specialization 2 and Specialization 3)**

BCA42 I CO: IT Entrepreneurship and Supply Chain Management

BCA427 O: Co puter based Financial Management BCA42::' 'J: Dat1 arehousing and Mining

**Year:** ! 'Tnd S,·mcster: **TT(Specialization 4, Specialization 5, Specialization 6)**

BCA471 0: Mauo and Micro Economics

BCA4T ): Func!amentals of Marketing and Business Strategy BCA47:: ): Information Security





1. Netw r ing and Cloud Computing

**Year: V and cmester** :I ( **Specialization 1, Specialization 2 and Specialization 3)**

BCA228CO: Cloud Computing and Big Data BCA229CO: Network System Administration BCA230 CO: Remote Sensing and GIS

**Year:** l -and S..-mcster: **II(Specialization 4, Specialization S, Specialization 6)**

BCA47'l CO: Do 1 1et Programming

BCA--!-7: \_:O: Wireless Network and Mobile Computing BC -1 .' \_ 0: l 1t.:met of Things

C: Digital o nn ere and Business Analytics

Year :1 *1* a d .'emcster :I ( **Specialization 1, Specialization 2 and Specialization 3)**

BCA"'- , ' . 'i· ;ii-Commerce

*BCP.* ,·· '·., .:1l and Cloud-Governance

BC/. · *,::.1.* ':·media and Application

Year :" s,,·•es er :II ( Specialization **4, Specialization 5 and Specialization 6)**

BCA48r CO: Big Data

|  |  |  |  |
| --- | --- | --- | --- |
| BCAI'' | *-r-* |  | l1ase Programming |
| BC/\ |  | : r. | >1ess Analytics |



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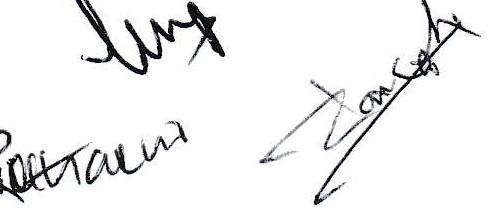
**Year: I**

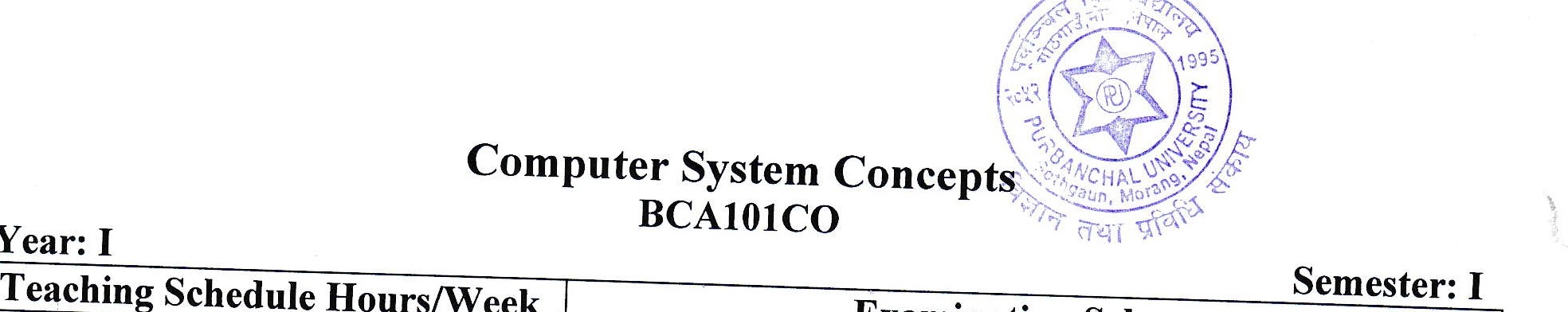
*BCA 4 Years I Purbanchal University*



**Semester: I**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Credits** | **Lecture**  **(Hrs.)** | **Tutorial (Hrs.)** | **Laboratory (Hrs.)** | **Total (Hrs.)** |
| BCA101CO | Computer System  Concepts | 3 | 3 | 1 | 2 | 6 ' |
| BCA102HS | Mathematics-I | 3 | 3 | 2 | - | 5 |
| BCA103HS | Technical English | 3 | 3 | 1 | - | 4 |
| BCA104CO | Computer programmmg  in C | 3 | 3 | 1 | 3 | 7 |
| BCA105CO | Digital Logic **0** | 3 | ,.,  *.)* | 1 | 2 | 6 |
| BCA106CO | Computer Project  - I | 2 | - | - | 3 | 3 |
|  | **Total** | **17** | **15** | **6** | **10** | **31** |

Note :- Each semester of BCA program spans over a period of 15 weeks of class work and one week of internal examinations, such as internal tests, quizzes, and mid-term examination.



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Teachinp Schedule Hours/Week** | | | **Examination Scheme** | | | | |
| **Theory** | **Tutorial** | **Practical** | **Internal Assessment** | | **Final** | | **Total** |
| **3** | **1** | **2** | **Theory** | **Practical** | **Theory** | **Practical** | **100** |
| **20** | **20** | **60** | - |

**Course Objective:** The main objective of this course is to provide basic knowledge of computer and its components, and their applications in various fields.

#### Course Contents:

###### Unit 1: Introduction to Computer (4 Hrs)

Characteristics and components of computer; History and generation of computers; Classification of computer based on purpose, size and technology; Applications of Computers - Computer in business and Industry, Computers in home, Computer in education and training, Computers in entertainment, science, medicine and engmeermg.

**Unit 2: Basic Computer Organization and Computer Peripherals (4 Hrs)** Block diagram of computer system; Input devices: Keyboard, mouse, and other types of input devices; Output devices: Monitor, printer, and other types of output devices.

###### Unit 3: Computer Storage (4 Hrs)

Concepts of memory and requirements of storage devices; Classification and types of storage devices; ROM and RAM with their types; Magnetic devices and Optical devices

###### Unit 4: Computer Software (4 Hrs)

Introduction and types of software; Definition and functions and types of operating system; Programming languages and their types.

###### Unit 5: Introduction to Database (4 Hrs)

Meaning of data and information; Concepts and characteristics of database and DBMS; Database Models; Data Warehouse & Data Marts, Data Mining; On-Line Analytical Processing (OLAP).

###### Unit 6: Networks and Internet (10 Hrs)

Introduction to communication system and computer network; Uses of computer network; Types and topologies of network; Network media and network software; Introduction, features and applications of Internet; Intranet and Extra-net; World Wide Web, E-mail, E-commerce, E-Learning, E-Govemance, E-Banking; Introduction to Network Protocols (TCP/IP, HTTP, HTTPs, FTP, SMTP, POP3, IMAP).

###### Unit 7: Information Security (2 Hrs)

Introduction to Information Security; Computer crime, viruses and threats; Cyber law and ethical issues.



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**Umt 8: Computer Hardware** *- \_-•un.*i,10•, **(7 Hrs)**

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Motherboard and its parts, slots, daughterboard, and expansion slo s; BIOS, SMPS,

CMOS, and Microprocessor.

**Unit 9: Technological trends in Information Technology (6 Hrs.)** Cloud Computing, Artificial Intelligence, BIG Data, IoT, Robotics, Virtual Reality, Augmented Reality, Blockchain Technologies,

#### Laboratory Works:

1. **Basics of Windows and User Interface**

Using mouse and moving icons on the screen

The My Computer icon, the Recycle Bin icon, Status Bar, Start button, Menu Bar Opening, closing and running an application

Using Windows Explorer to view files, folders and directories Creating and renaming files and folders

Windows settings: control panel, wallpapers, screen savers, date and time, sound Advanced features: using right mouse button, shortcuts, notepad, accessories

1. **Basic DOS Commands**

Comparison of DOS and Windows, switching between DOS and Windows

- Creating, renaming, copying, moving, and deleting files and directories

1. **Word Processing:**

Basics: opening and closing documents, savmg documents, page setup, printing, scrolling around a document

Text manipulation and formatting: text selection, cut, copy and paste, font, Bold, Italic and Underline, text alignment, line and paragraph setting, changing font, size and color, bullets and numbering, changing case

Table manipulation: drawing and inserting table, changing cell width and height, alignment of text in cell, inserting and deleting rows and columns, table borders

1. **Spreadsheets:**

Basics: opening and closing of spreadsheet, multiple sheets, Menu Bar, cell inputting, cell addressing

Manipulation of cells: entering texts, creating tables, setting cell width and height, copying of cells

Formulas: sum, average, percentage, and other basic functions

Preparing invoices/budgets, totaling of transactions, maintaining daily and monthly reports

1. **Presentations:**

Basics: opening a PowerPoint presentation, using Wizard to create a presentation

Slide presentation: title, text, picture, table, font color and font size, bullets and indenting, slide design, background, slide numbering, slide show, slide animation, slide sorting, printing slides

1. **Computer Communication and Internet:**

Basics of computer network, WWW, and websites Web browsing, net surfing, chatting, using e-mails

1. **Computer Hardware**

Assembling and disassembling of computer system

Installation of operating system, utilities and application software Installation of printer

Routine checks and troubleshooting Virus protection

Network cabling and Internet connectivity

#### References:

1.

2.

3.

4.

5.

6.

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12.

Peter Norton, "Peter Norton's Introduction to Computer", Tata McGraw-Hill Publishing Company Limited

Robert Cowart, "Mastering Windows-Premium Edition", BPB Publication Ron Mansfield, "Mastering Word", BPB Publication

Thomas Chester, "Richard A. Alden, Mastering Excel", BPB Publication Katherine Murray, "Mastering Power Point", BPB Publication

Shankar N. Adhikary, Ajay K. Shah, "Business Application of Computers", Buddha Publication

Winn L. Rosch, "The Hardware Bible", 3rd Edition, PHI

Mark Minasi, "The Complete PC Upgrade & Maintenance Guide" Scott Mueller, "Upgrading & Repairing PCs"

Alexis Leon & Mathews Leon, "Fundamentals of Information Technology", Leon Techworld

P. K. Sinha, "Computer Fundamentals", BPB Publication

V. Rajaraman, "Fundamentals of Computer"

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# Mathematics - I

**BCA102HS**

**Year: I**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Teachin Schedule Hours/Week** | | | **Examination Scheme** | | |
| **Theory** | **Tutorial** | **Practical** | **Internal Assessment** | **Final** | **Total** |
| **3** | **2** | - | **Theory** I **Practical** | **Theory** I **Practical** | **100** |
| **20** I - | **80** I |

**Course Objective:** The main objective of this course is to provide a sound knowledge of calculus and other related topics.

#### Course Contents:

**Unit 1: Sets and Functions (5 Hrs)**

Sets and Algebra of sets, Union, Intersection, Difference, Complement, Properties and Exercise, Venn Diagram, Real Number System, Intervals, Absolute Value of Real Number line Relations and functions Graphs of simple algebraic function.

**Unit 2: Limit and Continuity (3 Hrs)**

Concept of Limit, Left and right hand Limit. Existence of limits, Indeterminate forms, Infinity as Limit, Idea of x'-cx:. Continuity, definitions, properties. Exercises on evaluation of limits and test of continuity.

**Unit 3: Derivatives (6 Hrs)**

Definitions of Derivatives: Mathematical, Slope of a curve and Rate of change (relative); Derivative Rules: Power, Sum, Product, Quotient, Implicit, Chain, Parametric (Mainly algebraic); Trigonometric, Exponential, Logarithmic, Inverse trigonometric.

**Unit 4: Application of Derivatives (6 Hrs)**

Sign of f''(x) - Increasing, Decreasing functions; The Sign of (x), Concavity, Points of Inflexion; More about graphs, Simple curve tracing; Local & Absolute extrema; Indeterminate Forms, Use of L Hospital's Rule, Taylor's and Maclaurin's Series (Without Proofs); and their Expansions.

**Unit 5: Integral Calculus (6 Hrs)**

Indefinite integrals as reverse of differentiation; Integration rules - Integration Formulas, Substitutions, Trigonometric Substitutions, and Integration by parts; Standard Integrals ,Use of Partial Fractions.

**Unit 6: Definite Integrals (6 Hrs)**

Limit of a sum, Fundamental theorem of Integral Calculus, Evaluation of Integrals using Standard Integrals, Applications in Calculating Area, Length, Volume and Average Value, (Common Curves Only).

**Unit 7: Sequence and Series (7hrs)**

Notations, General terms, Limit of Sequence, Partial Sum of series, Convergent Sequences, Convergence of series, Important Series, Financial Series including their Validities, Tests of Convergences applications only Comparison, Ratio, Logarithmic, including Integral test., Series with non-negative terms, Alternating Series, Absolute Convergence, Conditional Convergence.

**Unit 8: Differential Calculus (6 Hrs)**

Function of two and three variables, Extension of ideas of limits and continuity, Partial derivatives, Theorem Exercises. Higher order derivatives, Leibnitz theorem.

**References:**

1.

### 2.

3.

4.

5.

6.

7.

8.

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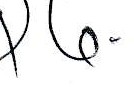
Basic Mathematics (Vol. I & II) - D R. Bajracharya et.al

Calculus: Different & Integral - R. K. Patnaik.

Calculus with Analytic Geometry - Leigthold, Harper & Row Calculus - Larson Hostetler, Health.

Integral Calculus - G.D. Pant and G.S. Shrestha. Algebra - G. D. Pant.

Differentials Calculus - M.B. Singh and B.C.B.

**Year: I**

# Technical English

**BCA103HS**

**Semester: I**

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| --- | --- | --- | --- | --- | --- |
| **Teaching Schedule Hours/Week** | | | **Examination Scheme** | | |
| **Theory** | **Tutorial** | **Practical** | **Internal Assessment** | **Final** | **Total** |
| **3** | **1** | - | **Theory** I **Practical** | **Theory I Practical** | **100** |
| **20** I **20** | **60** I - |

**Course objective:** The main objective of this course is to develop intensive and extensive skills needed for oral presentation and writing and presenting a seminar paper

#### Course Contents:

**Unit 1: Oral Communication (10 Hrs).**

**Oral Presentation Skills:** Introduction; Getting Started on Presentations; Planning; Organizing and Composing; Preparing; Rehearsing; Presenting; Organizing a Group Presentation; Writing and Presenting a Seminar Paper

**Unit 2: Reading: Intensive and Extensive (16Hrs) Intensive Reading:** How to Tackle Reading Materials; Practice on Contextual Grammar (Prepositions; Active Voice and Passive Voice; Tense based Practice; Direct Speech and Indirect Speech; Subject Verb Concord; Error Analysis; Stress); Reading Techniques (Skimming; Scanning; Note Making; Summary Writing.

**Extensive Reading:** How to Tackle Extensive Reading Materials; Practicing Extensive Reading.

**Unit 3: Writing (19Hrs)**

**Business Communication:** Rules of Good Writing; Fax Message and Electronic Mails; Memos; Meetings (Notice Preparation, Agenda Preparation and Minutes Preparation).

**Persuasive Communication:** Notices, Advertisements and Leaflets.

**Letters:** Official Letters (Standard Letter Format; Writing Letters for Asking and Giving Instruction, Letters of Request, Apology and Explanation, Complaint and Order); Letter of Application (Standard Format; Preparing CV, Bio-data and Resume; Writing Letters of Application).

**Proposals:** Introduction; What Is a Proposal?; Getting Started on Proposal; Composing Informal; Proposals; Composing Formal Proposals.

**Information Reports:** Introduction; Getting Started on Informative Reports; Summary and Abstract; Mechanism and Description; Periodic Reports; Progress Reports; News Releases.

**Recommendation Reports:** Introduction; What Is a Recommendation Report? Starting a Recommendation Report; Formatting and Organizing Recommendation Reports; Composing Recommendation Reports.

**Workshop/seminar(s)** should be conducted to enhance the reading, writing, listening and speaking skills.

#### References:

1. Taylor, Shirely. Communication for Business: A Practical Approach. London: Longman, 2005.
2. Smith-Worthington, Daelene and Sue Jefferson. Technical Writing fo-r

Success. 3rd ed.USA: Cengage Writing, 2011.

1. Adhikari, Usha, et al. A Course Book of Communicative English. Kathmandu: Trinity Publications, 2012
2. Mohan, Krishna and Banerji, Meera. (1990). Developing Communication Skills. Macmillan: New Delhi.
3. Gerson, S. J. and Gerson S. M. (2007). Technical Writing. Pearson Education: New Delhi.
4. Leech, G. And Svartvik, J. (1975). A Communicative Grammar of English. ELBS: England.
5. Sinha, R. P. (1991). How to Write Correct English. BharatiBhawan: India.
6. Swan, Michael. (1980). Practical English Usage. OUP: Oxford.
7. Thakur, K. P. (1989). A Practical Guide to English Grammar. BharatiBhawan: India.



**Year:** I

# Computer Programming in C

**BCA104CO**

**Semester:** I

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| **Teachin:• Schedule Hours/Week** | | | **Examination Scheme** | | | | |
| **Theory** | **Tutorial** | **Practical** | **Internal Assessment** | | **Final** | | **Total** |
| **3** | **1** | **3** | **Theory** | **Practical** | **Theory** | **Practical** | **100** |
| **20** | **20** | **60** | - |

**Course Objective:** The main objective of this course is to enable students familiarize with writing algorithms and developing programs using C language.

#### Course Contents:

**Unit 1: Problem s·olving with Computer (3 Hr )**

Problem analysis, Algorithms andFlowchart; History and Importance ofC; Structure of Cprogram; Coding, Compilation andExecution; Debugging, Testing andDocumentation.

**Unit 2: Elements of C (3 Hrs)**

C Tokens; Escape sequence; Variables; Data types; Constants/Literals; Expressions; Statements and Comments.

**Unit 3: Input and Output**

Conversion specification; *VO* operation; Unformatted and Formatted I/O.

**(4 Hrs)**

**Unit 4: Operators and Expression (3 Hrs)**

Arithmetic operator; Relational operator; Logical and Boolean operator; Assignment operator; Ternary operator; Bit-wise operator; Increment and Decrements operator.

**Unit 5: Control Statements (4 Hrs)**

Branching; Looping; Exit function, Break and Continue statement; Goto statement.

**Unit 6: Arrays (6 Hrs)**

Introduction; Declaration of array; Initialization of array; Sorting; Multidimensional array; String and String handling functions.

**Unit 7: Functions (5 Hrs)**

Local, global, static and Register variables; Library functions and User-defined functions; Pass by value and Pass by reference; Recursion; Use of array in function.

**Unit 8: Pointers (6 Hrs)**

Introduction and importance of Pointers; Reference and dereference operator; Pointer arithmetic; Pointer and array; Pointer with multidimensional array; Pointer and strings; Dynamic memory allocation.

**Unit 9: Structure and Union (5 Hrs)**

Introduction; Array of structure; Passing structure to function; Passing array of structure to function; Pointer to structure; Structure within structure (Nested structure); Union.

**Unit 10: Files and File Handling in C (4 Hrs)**

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Introduction and Importance of files; Opening and closing a file; File Opening Modes; Input/output function; Sequential and Random access in file.

**Unit 11: Introduction to Graphics**

Modes; Initialization; Graphics Function.

**(2 Hrs)**

**Laboratory:** Laboratory exercises are necessary to be done in different chapters. At the end of each chapter, laboratory reports are required to be submitted to teacher for evaluation.

**LABORATORY EXERCISE FOR BCA104CO**

**Lab class will cover all above mentioned topics and shall include at least the following lab exercises.**

1. Display messages as output
2. Simple interest calculation
3. Area and circumference of circle
4. Area and perimeter of rectangle
5. Character conversion from lower case
6. Character conversion from upper case to lower case and vice versa
7. Reading and writing a line of text
8. Averaging student exam scores
9. Compound interest calculation
10. Syntactic errors
11. Execution errors (Real root of a quadratic equation)
12. Debugging a program
13. Debugging with an interactive Debugger
14. Calculating total expenses
15. Calculating bonus
16. Calculating division of students
17. Generating consecutive integer quantities
18. Averaging a list of numbers
19. Converting Several lines of character to uppercase
20. Encoding a string of characters
21. Repeated compound interest calculations with error trapping
22. Solution of an algebraic equation
23. Calculating depreciation
24. Searching for palindromes
25. Largest of three integers quantities
26. Calculating factorials
27. Simulation of a game of chance
28. Printing backwards
29. The tower of Hanoi
30. Average length of several lines of text
31. Search for a maximum
32. Generating Fibonacci numbers
33. Deviation about an average
34. Reordering a list of numbers
35. A piglatin generator
36. Factors, prime Factors, LCM, HCF
37. Adding two tables of numbers

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1. Recording a list of strings
2. Analyzing a line of text
3. Displaying the day of the year
4. Future value of monthly deposit (compound interest calculations)
5. Updating customer records
6. Locating customer records
7. Raising a number to a power
8. Creating a data file (lower case to upper case text conversion)
9. Reading a data file
10. Creating a file containing customer records
11. Updating a file containing customer records
12. Creating an unformatted data file containing customer records
13. Graphic programming- Displaying different shapes

#### References:

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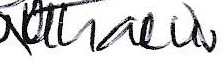
E. Balagurusamy "Programming in ANSI C", Tata Mc Graw-Hill Publishing. Deitel: C: How to program, 2/e(with CD), Pearson Education.

Al Kelley, Ira Pogl, "A Book on C", Pearson Education.

Brian W. Kernighan & Dennis M. Ritchie, "The C Programming Language", PH.

Byron S. Gottfried, "Programming with C, Tata Mc Graw-Hill Publishing.

Stephen G. Kochan, "Programming in C", CBS publishers & distributors. Yashvant Kanetker "Let Us C", BPB Publication.

## Digital Logic

**BCAlOSCO**

**Year** I

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| **Teachino- Schedule Hours/Week** | | | **Examination Scheme** | | |
| **Theory** | **Tutorial** | **Practical** | **Internal Assessment** | **Final** | **Total** |
| 3 | **1** | **2** | **Theory** I **Practical** | **Theory** I **Practical** | **100** |
| **20** I **20** | **60** I - |

**Course Objective:** The Main objective of this course is to familiarize students with principles of digital computer organization and design.

#### Course contents:

**Unit 1: Number Systems (5 Hrs)**

Introduction, Comparison between analog and digital system, Number system and conversion (Binary, Octal, Hexadecimal), signed and unsigned numbers, fraction conversion, Binary Arithmetic, Representation of Binary coded decimal, gray code, alphanumeric code and error detection and correction codes

**Unit 2: Boolean Algebra and Logic Gates (6 Hrs)** Introduction to Boolean algebra; Basic theory and properties of Boolean algebra; Boolean functions; Logic gates and operations.

**Unit 3: Simplification of Boolean Functions**

K-Map; Two and three variable maps; Product Simplification of NAND and NOR implementation.

**(6 hrs)**

of sums, sum of products;

**Unit 4: Combinational Logic (8 Hrs)**

Design procedure of Adders and Subtractors; Code conversion, Analysis procedure; Multilevel NAND gates; Multilevel NOR gates.

**Unit 5: Combinational Logic Circuits**

Binary parallel adder; Decimal adder; Magnitude comparator; Decoders; Multiplexers; Read only memory Programmable logic array (PLA).

**(8 Hrs)**

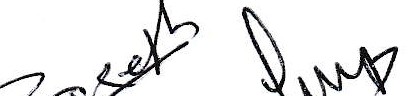
**Unit 6: Sequential Logic (6 Hrs)**

Difference between sequential and combinational circuit; Introduction and Design procedure of RS, JK, T, D and master-slave flip flops; Design with state equation and state reduction table.

**Unit** 7: **Registers and Counters** . **(6 Hrs)**

Introduction; Left and right shift register; Serial in serial out, Serial in parallel out, Parallel in serial out, Parallel in parallel out; Asynchronous and Synchronous counter; Asynchronous up and down counter; Decade counter, Ring counter; Application of counter.

## Laboratory:

1. Familiarization with logic gates
2. De Morgan's law
3. Multiplexer and de-multiplexer
4. Encoder and decoder
5. Half adder and half subtractor
6. Full adder and full subtractor
7. RS, JK, T,D and master slave flip flops
8. Shift registers, Sequential logic
9. Ripple counters and synchronous counters
10. Simulation using suitable software

#### References:

1.

2.

3.

4.

5.

Floyd T. L & Jain R. P, "Digital Fundamentals", 8th edition

Morris Mano, "Logic & Computer Design Fundamentals", Pearson education William I, Fletcher, "An Engineering Approach to Digital Design", Prentice Hall of India, New Delhi, 1990

A.P. Malvino & Jerald A. Brown, "Digital Computer Electronics", 1995

D. D. Hodegs & H.G. Jackson, "Analysis & Design of Digital Integrated Circuits", McGraw Hill, New York, 1983

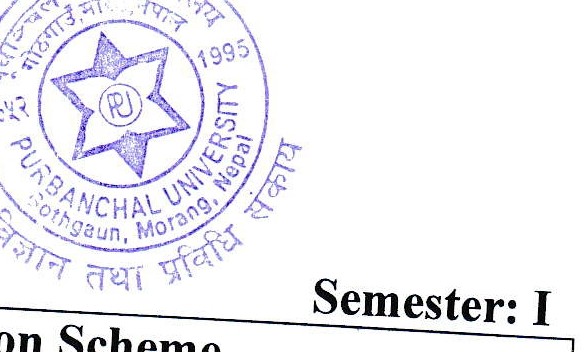
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**Year:** I

# Computer Project-I

**BCA106CO**

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| --- | --- | --- | --- | --- | --- |
| **Teachin Schedule Hours/Week** | | | **Examination Scheme** | | |
| **Theory** | **Tutorial** | **Practical** | **Internal Assessment** | **Final** | **Total** |
| - | - | **3** | **Theory** I **Practical** | **Theory** I **Practical** | **100** |
| - I **60** | - I **40** |



**Course Objective:** The main objective of this course is to enable students design and complete the software project by using high-level language (C-Programming).

#### Course Contents:

A Project group will be developing a software project by using high-level language (C­ Programming *I* BCA104CO). Every student of the group should work at least for 45 lab hours under the supervision of the assigned supervisor. Students must develop the assigned software,-submit written report, and give oral presentation.

**General Procedure:**

1. Information Gathering
2. System requirements specifications
3. Algorithms and Flowchart
4. Coding Techniques
5. Result
6. Documentation

**The Project document shall include the following:**

1. Technical description of Project
2. System aspect of the project
3. Implementation of project
4. Project tasks and time schedule
5. Project team members
6. Project Supervisor

**Project Evaluation Criteria for Internal assessment:**

The marks allocated for the project should be evaluated based on the following criteria:

* + Title identification and Proposal Writing- 10 Marks
  + Mid-term Presentation-20 Marks
  + Pre-final Submission and final Presentation - 30 Marks

**Project Evaluation Criteria for External assessment:**

The marks allocated for the project should be evaluated based on the following criteria:

* + Project Documentation- 20 Marks
  + Final Presentation - 10 Marks
* VIVA- 10 Marks

**Project Group Size: 2 to 3** students in one group.

