

**SEMESTER – I**  
**BASIC COMPUTER SKILLS**

**1. Course Description:****Programme: BA/B.Sc./B.Com./BMS****Max. Hours: 30****Course Code: U24/BCS/AECC/101****Hours per week: 2****Type of course: AECC****Max. Marks: 50****No. of credits: 2****2. Course Objectives:**

To impart a basic level understanding of working of a computer and its usage.

**3. Course Outcome:**

On completion of the course the student will be able to:

**CO1: *Interpret* basics of computers and *Use* word processing software**

(Cognitive levels – 3)

**CO2: *Define* Internet Technologies and *Use* Spreadsheets and Presentation Software**

(Cognitive level – 3)



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**4. Course Content:****MODULE I: BASICS OF COMPUTERS AND WORD PROCESSING (15 Hrs)**

**Understanding Of Computer:** Introduction to computers - functions, features, classification; Computer Architecture - components; Computer Hardware - input devices, output devices; Computer Memory -primary memory, secondary memory, cloud; Computer Software - system software, application software, special purpose software, system utilities, open-source software, and proprietary software; Operating Systems - functions, types, real time operating systems,

**Windows Ui And Word Processing:** Windows desktop – icons, task bar, start menu, understanding of local system drives, folders and files – creating, viewing, renaming, deleting; MS-Word - opening , closing, saving of documents, title bar, ribbon and tabs, ruler; text creation and manipulation – insert, delete, select, cut, copy and paste, find and replace, correct errors - spell; formatting text – font size, size, colour, bold, underline, italic, changing text case, text alignment; creating first line indent of paragraphs; formatting page – inserting header and footer, page breaks; modifying page layout - changing page orientation , page size, page margins; tables – inserting, adding and deleting rows and columns, converting text to table, working with lists, using symbols as bullets, printing documents

**MODULE II: INTRODUCTION TO INTERNET TECHNOLOGY, SPREADSHEETS AND PRESENTATION SOFTWARE (15Hrs)**

**Overview of Internet and Future Technology:** Internet – advantages and disadvantages of internet; Terms related to internet – WWW, web page, website, web browser, web address and URL, blog, search engine; Services of Internet – chatting, e-mail, video- conferencing, e-learning, e-banking, e-shopping, e-reservation; Social networking sites – LinkedIn, Facebook, Instagram; Computer Security – sources of cyber-attack, malware, threats to computer security, solutions to computer security threats; Future Technology – Internet of Things(IoT), Big Data Analytics, Virtual Reality, Artificial Intelligence,

**Spreadsheet and Presentation Software:** Spreadsheets - Workbook, worksheet, MS Excel vs Google sheets; basics of spreadsheet – enter, select, delete, move, copy and paste data, fill numbers, text, date; adding borders to cells, functions – count, sum, average; formulas – simple, relative reference, absolute reference, printing worksheet; Presentation – introduction to slide, placeholder, notes, adding slides, changing layouts of slides, applying styles and background, adding text box and pictures, adding animations, setting slide transitions, saving single slide as image, saving presentation in different formats (ppt, pdf, video)

**5. References:**

1. Microsoft Office Step by Step (Office 2021 and Microsoft 365), Joan Lambert, 1<sup>st</sup> edition, 2022
2. Computer Basics with Office Automation, Archana Kumar, Wiley publications, 2019
3. Introduction to Computers, Peter Norton, McGraw-Hill , 2012.
4. Fundamentals of Computers, Reema Thareja, 2<sup>nd</sup> Edition 2019.

**6. Syllabus Focus**

**a) Relevance to Local, Regional, National and Global Development Needs**

<b>Local /Regional/National /Global Development Needs</b>	<b>Relevance</b>
GLOBAL DEVELOPMENT	Basic computer skills such as word processing, spreadsheets, presentations, and the internet, are essential for most jobs and are considered valuable skills in the workforce. Good computer skill aligns with an individual's career goals and enhances productivity and effectiveness in the workplace.

**b) Components on Skill Development/Entrepreneurship Development/Employability**

<b>SD/ED/EMP</b>	<b>Syllabus Content</b>	<b>Description of Activity</b>
SD, EMP	Module 1	Assignment
SD, EMP	Module 2	Skill practical test

**7. Course Assessment Plan**

**a) Weightage of Marks in Formative and Summative Assessments**

<b>Formative Assessment - FA (40%)</b>	<b>Summative Assessment - SA (60%)</b>
<b>CIA-20 marks Mini project/Assignment/ Problem solving/Case studies</b>	<b>End Semester Exam-30 Marks</b>

  
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## b) Model Question Paper - End Semester Exam

**BASIC COMPUTER SKILLS**

**Course Code: U24/BCS/AEEC/101**  
**Credits: 2**

**Max Time: 1 Hr**  
**Max. Marks: 30**

**Answer any 5 of the following:**

**5 X 6 = 30 M**

1. Explain Computer Architecture.
2. Differentiate between Primary and Secondary Memory.
3. Explain functions of an Operating System.
4. Define types of Software.
5. Write a short note on the Internet.
6. List and explain the services of the Internet.
7. Explain with example the concept of IoT.
8. Explain various threats to computer systems.

Prepared by	Checked & verified by	Approved by
 <b>Ms. Prabhmeet</b> <b>Teaching Faculty</b>	 <b>Ms. D. Sowjanya</b> <b>HOD</b>	 <b>Dr. Uma Joseph</b> <b>Principal</b>



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DIFFERENTIAL AND INTEGRAL CALCULUS

1. Course Description

Programme : B. Sc  
 Course Code : U24/MAT/DSC/101  
 Course Type : DSC I  
 No. of credits : 4

Max. Hours : 60  
 Hours per week : 4  
 Max. Marks : 100

2. Course Objectives

- To acquaint the students with concepts of Differential Calculus.
- The notion of instantaneous rate of change finds applications in Geometry, Mechanics other branches of Theoretical Physics and also to Social Sciences like Economics and Psychology.

3. Course Outcomes

On completion of the course the student will be able to:

- CO 1: Interpret the successive differentiation, Partial derivatives, total derivatives of the given functions of two variables. (INTERPRET)
- CO 2: Apply the concepts to find maximum and minimum values of functions and to expand functions as power series. (APPLY)
- CO 3: Examine the concepts of Curvature and its derivation. (EXAMINE)
- CO 4: Evaluate the length of plane curves and volume of surfaces of revolution. (EVALUATE)



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4. Course Content

MODULE I:

(15 HRS)

SUCCESSIVE DIFFERENTIATION:

Higher order derivatives, Calculation of the nth derivative, some standard results.

PARTIAL DIFFERENTIATION :

Introduction, Functions of two variables, Neighbourhood of a point (a, b), Continuity of a function of two variables, Continuity at a point, Limit of a function of two variables, Partial Derivatives, Geometrical representation of a function of two variables, Homogeneous functions, Theorem on total differentials, Composite Functions, Differentiation of Composite functions, Implicit functions.

Sections: 5.1, 5.2 11.1 to 11.9.

Pg No's: 166-172, 356-385.

MODULE II:

(15 HRS)

PARTIAL DIFFERENTIATION

Equality of  $f_{xy}(a,b)$  and  $f_{yx}(a,b)$  , Taylor's theorem for a function of two variables

MAXIMA AND MINIMA:

Maximum value of a function, minimum value of a function, A necessary condition for extreme values, Sufficient condition for extreme value, Maxima and Minima of function of two variables, Lagrange's method of undetermined multipliers.

Sections: 9.1 to 9.3, 9.6, 9.7, Pg No's 281-286, 310-333,

Sections: 11.10, 11.11, Pg No's 386-392

MODULE III:

(15 HRS)

CURVATURE AND EVOLUTES:

Introduction, Definition of Curvature, Radius of Curvature, Length of Arc as a function, Derivative of Arc, Radius of Curvature, Cartesian equations, Newtonian method, Centre of Curvature, Chord of Curvature, Evolutes and Involutives, Properties of the Evolutes.

Sections: 14.1 to 14.8

Pg No's 421-453

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## MODULE IV:

(15 HRS)

**LENGTHS OF PLANE CURVES**Introduction-Expression for the Lengths of the curves  $y=f(x)$ Expressions for the Length of arcs  $x=f(y)$ :  $x=f(t)$ ,  $y=\varphi(t)$ ;  $r=f(\theta)$ **VOLUMES AND SURFACES OF REVOLUTION**

Introduction- Expression for the Volume obtained by revolving about either axis, Expression for the Volume obtained by revolving about any line.

Sections: 8.1 to 8.3 Pg. No's 183-189

Sections: 9.1 to 9.3 Pg No's 196-208.

**5. References**

1. Shanti Narayan, Dr. P.K. Mittal, *Differential Calculus*, S. Chand Publications, 2016 Reprint.
2. Shanti Narayan, *Integral Calculus*, S.Chand, New Delhi
3. William Anthony Granville, Percy F Smith and William Raymond Longley;  
Elements of the differential and integral calculus
4. Joseph Edwards, *Differential calculus for beginners*
5. Smith and Minton, *Calculus*
6. Elis Pine, *How to Enjoy Calculus*
7. Hari Kishan, *Differential Calculus*
8. B.Sc. First Year Mathematics published by Telugu Akademi.



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## 6. Syllabus Focus

## a) Relevance to Local , Regional , National and Global Development Needs

Local /Regional/National /Global Development Needs	Relevance
Global	Differential equations find widespread application in modelling various phenomena in physics, chemistry, and biology, as well as in computer applications such as algorithms and data structures

## b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
Skill Development	Module 1: Successive Differentiation	Plotting a graph using Sage Software
Employability	Module 2: Taylor Series	Calculation of functions involving exponential, logarithmic, trigonometric etc.
Skill Development	Module 3: Involutes	Tracing curves using Maple Software

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## 7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Participative Learning	Skill Tests
2.	Experiential Learning	Quiz
3.	Problem solving	Group Discussions, Assignments

## 8. Course Assessment Plan

## a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

CO	Continuous Internal Assessments CIA - 40%	End Semester Examination-60%
CO1	CIA-I(Written Exam)	End Semester Examination
CO2	CIA-I(Written Exam)	
CO3	CIA-II (Skill Tests)	
CO4	CIA-II (Assignments)	

  
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b) Model Question Paper- End Semester Exam

DIFFERENTIAL AND INTEGRAL CALCULUS

Course code: U24/MAT/DSC/101  
No. of credits: 4

Max. Marks: 60M  
Time: 2 Hrs

SECTION-A

I. Answer the following

4 x 10 = 40 M

1. If  $x^x y^y z^z = c$ , show that at  $x = y = z$ ,  $\frac{\partial^2 z}{\partial x \partial y} = -(x \log(ex))^{-1}$

OR

2. If  $z = xyf(y/x)$ , show that  $x \frac{\partial z}{\partial x} + y \frac{\partial z}{\partial y} = 2z$  and if  $z$  is a constant then  $\frac{f'(y/x)}{f(y/x)} = \frac{x(y+x \frac{dy}{dx})}{y(y-x \frac{dy}{dx})}$

3. Expand the function  $f(x, y) = x^2 + xy - y^2$ , by Taylor's theorem in power of  $(x - 1)$  and  $(y + 2)$ .

OR

4. Find a point within a triangle such that the sum of the squares of its distances from the three vertices is a minimum.

5. Apply Newton's formula to find the radius of curvature at the origin for the cycloid  $x = a(\theta + \sin\theta)$ ,  $y = a(1 - \cos\theta)$ .

OR

6. Find the evolute of parabola  $y^2 = 4ax$ .

7. Find the length of the arc of the curve  $y = \log(\sec x)$  from  $x = 0$  to  $x = \pi/3$ .

OR

8. Find the volume of the solids obtained by revolving the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  about the axis of  $X$ .

SECTION-B

II. Answer any FOUR

4 x 5 = 20 M

9. If  $u = \sin^{-1}(\frac{x^2+y^2}{x+y})$ , prove that  $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \tan u$ .

10. Verify Euler's theorem for  $z = ax^2 + 2hxy + by^2$ .

11. If  $H = f(y - z, z - x, x - y)$ , prove that  $\frac{\partial H}{\partial x} + \frac{\partial H}{\partial y} + \frac{\partial H}{\partial z} = 0$ .

12. Find  $\frac{ds}{dt}$  given that  $x = ae^t \sin t, y = ae^t \cos t$ .

13. Find the radius and centre of curvature of  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ .

14. Find the perimeter of the cardioid  $r = a(1 - \cos\theta)$ .

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**DIFFERENTIAL AND INTEGRAL CALCULUS**  
**PRACTICAL**

**Programme : B.SC**

**Max. Hours : 30**

**Course Code : U24/MAT/DSC/101/P**

**Hours per week : 2**

**Course Type : DSC I**

**Max. Marks : 50**

**No. Of Credits : 1**

**Course Outcomes:**

**CO 1:** Solve problems on differentiation and integration of functions of two variables.

**CO 2:** Calculate the extreme values, radius of curvature, lengths of Curves, volumes of surfaces of revolutions.

**PRACTICAL SESSIONS**

1. Limits and Continuity of Functions of two Variables.
2. Partial Derivatives.
3. Homogeneous Function.
4. Maxima and minima of functions of two Variables.
5. Lagrange's Method of Multipliers.
6. Radius of Curvature.
7. Centre of Curvature, Chord of Curvature.
8. Evolutes and Involutives.
9. Lengths of Plane Curves.
10. Volumes and Surfaces of Revolution.

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**MODEL QUESTION PAPER**  
**PRACTICAL**

Course Code: U24/MAT/DSC/101/P

Max. Marks : 30

No. Of Credits: 1

Time: 2 Hrs

I. Answer any SIX

6 x 5 = 30 M

1. (a) Show that  $\lim_{(x,y) \rightarrow (-1,2)} (x^3 + y^3 / x^2 + y^2) = 7/5$ .  
(b) Show that  $\lim_{(x,y) \rightarrow (1,2)} (3x + 2y) = 7$ .
2. If  $z = f(x+ay) + \phi(x-ay)$  then prove that  $\partial^2 z / \partial y^2 = a^2 \partial^2 z / \partial x^2$ .
3. Verify Euler's theorem for (i)  $Z = ax^2 + 2hxy + by^2$  (ii)  $Z = (x^2 + xy + y^2)^{-1}$ .
4. Find the radius of curvature for the curve  $r = a(1 - \cos\theta)$ .
5. Find the co-ordinates of the centre of curvature at a point  $(x, y)$  of the parabola  $y^2 = 4ax$ .
6. Find the length of the arc of the curve  $y = \log(\sec x)$  from  $x=0$  to  $x=\pi/3$ .
7. Find the evolute of parabola  $y^2 = 4ax$ .
8. Find the volume generated by revolution of an arc of the catenary  $y = c \cosh(x/c)$  about the axis of X between  $x=a$  and  $x=b$ .

  
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**SEMESTER –I**  
**MECHANICS AND OSCILLATIONS**

**1. Course Description****Programme : B.Sc.****Course Code: U24/PHY/DSC/101****Type of course: DSC 1****No. of credits: 4****Max.Hours : 60****Hours per week:4****Max.Marks : 60****2. Course Objectives**

- To study the fundamentals of Mechanics.
- To understand the significance of Oscillations.

**3. Course Outcomes**

After the successful completion of the course, the student will be able to:

**CO1:** Interpret the analogy between translational and rotational dynamics, and their applications.

**CO2:** Apply Central forces in planetary motion and examine Frames of reference.

**CO3:** Summarise simple harmonic motion and interpret it's applications.

**CO4:** Analyse damping of oscillations and explain Ultrasonics.

**4. Course Content****MODULE-I MECHANICS OF PARTICLES AND RIGID BODIES**

(15 Hrs)

Laws of motion, motion of variable mass systems, motion of a rocket, multi-stage rocket, conservation of energy and momentum. Collisions in two and three dimensions, concept of impact parameter, scattering cross-section.

Definition of Rigid body, rotational kinematic relations, equation of motion for a rotating body, angular momentum and inertia tensor. Euler's equation, precession of a top, Gyroscope.

**MODULE-II CENTRAL FORCES AND SPECIAL THEORY OF RELATIVITY (15 Hrs)**

Central forces – definition and examples, conservative nature of central forces, conservative force as a negative gradient of potential energy, equation of motion under a central force, motion under inverse square law, derivation of Kepler's laws, Coriolis force and its expressions.

Galilean relativity, absolute frames, Michelson-Morley experiment, Postulates of special theory of relativity. Lorentz transformation, time dilation, length contraction, addition of velocities, mass-energy relation.

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**MODULE-III OSCILLATIONS****(15 Hrs)**

Simple harmonic oscillator and solution of the differential equation– Physical characteristics of SHM, torsion pendulum, measurements of rigidity modulus, Compound pendulum, measurement of g, combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies, Lissajous figures.

**MODULE-IV DAMPED OSCILLATIONS AND ULTRASONICS****(15 Hrs)**

Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy considerations, logarithmic decrement, relaxation time, quality factor.

Ultrasonics, properties of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostriction methods, detection of ultrasonics, determination of wavelength of ultrasonic waves, application of ultrasonics waves.

**5. Reference Text Books**

1. **Fundamentals of Physics.** Halliday/Resnick/Walker *Wiley India Edition 2007.*
2. **First Year Physics -Telugu Academy.**
3. **Introduction to Physics for Scientists and Engineers.** F.J. Ruche. *McGraw Hill.*
4. **Berkeley Physics Course. Vol.1, Mechanics** by C. Kittel, W. Knight, M.A. Ruderman
5. **Fundamentals of Physics** by Alan Giambattista et al *Tata-McGraw Hill Company Edition, 2008.*

**6. Syllabus Focus**

a) Relevance to Local, Regional, National and Global Development Needs

S. No	Student Centric Methods Adopted	Type/Description of Activity
1.	National	Advances in this subject contribute to space exploration, satellite communications, and national security.
2.	Global	Indispensable for driving innovation across a wide range of sectors critical for global development.

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b. Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
Skill Development	Module 3 & 4	Hands on Practicals

### 7. Pedagogy

S. No	Type/Description of activity	Student Centric Methods Adopted
1.	Seminar Presentation	Participative Learning
2.	Quiz	Experiential Learning
3.	Group Discussion	Participative Learning

### 8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

COs	Continuous Internal Assessments– CIA( 40%)	End Semester Examination (60%)
CO1	CIA-1	End Semester examination
CO2	CIA-1	
CO3	CIA-2- Assignment/ MCQ	
CO4	CIA-2 – Presentation/ Q&A	

  
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**b) Question Paper Pattern**

Course Code: U24/PHY/DSC/101

Time: 2 hours  
Max Marks: 60**SECTION-A****I. Answer the following**

4X10=40 M

1. Build an equation for the velocity on a rocket moving under the influence of earth's gravitational field.

OR

2. Derive Euler's equations of rotational motion of a rigid body fixed at one end and prove the law of conservation of angular momentum using Euler's equations.

3. Define central force. Show that the central force is (1) conservative and (2) negative Gradient of potential energy.

OR

4. Demonstrate the working of Michelson- Morley experiment and derive an equation for fringe shift. What is the significance of null result?

5. Derive an equation for measurement of rigidity modulus using torsional pendulum.

OR

6. Discuss the effect of combining two simple harmonic motions of the same frequency acting at right angles to each other.

7. a) Describe any one method of producing ultrasonics with a neat sketch.

b) A Piezo electric X- cut crystal of quartz has a thickness 0.002m. If the velocity of sound wave in the crystal is  $5750 \text{ ms}^{-1}$ . Calculate the fundamental frequency of the crystal.

OR

8. What is a damped harmonic oscillator? and derive the solution of the differential equation of damped oscillator.

**SECTION-B****II. Answer any FOUR**

4x5=20 M

9. Explain the working of gyroscope.

10. Build a note on Coriolis force.

11. Evaluate the speed of a clock if it moves relative to an observer; so that it may lose 4 minutes in 24 hours. When it actually keeps correct time.

12. Explain impact parameter and scattering cross section

13. List out applications of ultrasonics.

14. Outline the characteristics of simple harmonic oscillator.

## c) Question Paper Blueprint

Modules	Hours Allotted in the Syllabus	CO Addressed	Section A (No. of Questions)	Total Marks	Section B (No. of Questions)	Total Marks
1	15	CO-1	2	4x10=40	6	4x5=20
2	15	CO-2	2		(By taking at least one question from each Module)	
3	15	CO-3	2			
4	15	CO-4	2			

## 9. CO-PO Mapping:

CO	PO	Cognitive Level	Class room sessions (hrs)
1	1, 2	Analyze	15
2	2, 5	Understand	15
3	1, 2	Apply	15
4	1, 2	Understand	15

**MECHANICS AND OSCILLATIONS  
PRACTICAL  
SEMESTER -I**

## 1. Course Description:

Programme : B.Sc.  
Course Code : U24/PHY/DSC/101/P  
Type of course : DSC-1  
No. of credits : 1

Max. Hours: 30  
Hours per week: 2  
Max. Marks: 50

## 2. Course Objectives

- Evaluate elastic constants of solids and viscosity of fluids.

## 3. Course Outcomes:

**CO 1:** Analyse basics of the kinematics and dynamics in linear and rotational motion..

**CO 2:** Prepare a technical record on the experiments carried.

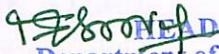
DEPARTMENT OF PHYSICS, ST. FRANCIS COLLEGE FOR WOMEN, HYDERABAD

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1. Study of a compound pendulum determination of 'g' and 'k'.
2. Determine 'Y' by uniform Bending
3. Determine 'Y' by Non-uniform Bending.
4. Determine moment of Inertia of a fly wheel.
5. Measurement of errors –simple Pendulum.
6. Determine rigidity modulus by torsion Pendulum.
7. Determine surface tension of a liquid through capillary rise method.
8. Determination of Surface Tension of a liquid by different methods.
9. Determine of Viscosity of a fluid.

#### 4. Reference Books

- a. D.P. Khandelwal, "A laboratory manual for undergraduate classes"  
(Vani Publishing House, New Delhi).
- b. S.P. Singh, "Advanced Practical Physics" (Pragati Prakashan, Meerut).
- c. Worsnop and Flint- **Advanced Practical physics for students.**
- d. "Practical Physics" R.K Shukla, AnchalSrivastava

  
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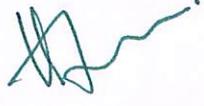
**MECHANICS AND OSCILLATIONS**  
**PRACTICAL MODEL QUESTION PAPER**  
**SEMESTER –I**

**Programme : B.Sc.**  
**Course Code : U24/PHY/DSC/101/P**  
**Type of course : DSC-1**  
**No. of credits : 1**

**Max. Hours: 30**  
**Hours per week: 2**  
**Max. Marks: 50**

**Answer any ONE of the Following:**

1. Study oscillations of compound pendulum determination of “g” and “k” .
2. Determine “Y” by uniform Bending.
3. Determine “Y” by Non-uniform Bending.
4. Determine moment of Inertia of a fly wheel.
5. Measure errors involved in simple Pendulum.
6. Determine rigidity modulus by torsion Pendulum.
7. Determine surface tension of a liquid through capillary rise method.
8. Determination of Surface Tension of a liquid by different methods.
9. Determine of Viscosity of a fluid.

Prepared by Course Teacher [Name & Signature]	Checked & Verified by HoD / Programme Coordinator [Name & Signature]	Approved by the Principal
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**SEMESTER - I**  
**PROGRAMMING IN C**

**1. Course Description****Programme: B.Sc.****Course Code: U24/CSC/DSC/101****Course Type: DISCIPLINE SPECIFIC CORE****No. of credits: 4****Max. Hours: 60****Hours per week:4****Max. Marks: 100****2. Course Objectives**

- To understand the art of writing programs using C
- To apply all the concepts learnt in C programming in developing programs and applications in C.
- To practice writing codes efficiently.

**3. Course Outcomes**

On completion of the course the student will be able to:

**CO1: *Illustrate* and *explain*** basic computer concepts such as binary number system, algorithms and flowcharts (Cognitive level – 2)

**CO2: *Apply*** programming principles of C language (Cognitive level – 3)

**CO3: *Choose* and *apply*** the correct type of branching/looping construct to solve common problems (Cognitive level - 5)

**CO4: *Design*** C programs that illustrate how derived data types, including arrays, strings, and functions, are utilized. (Cognitive level – 6)

#### 4. Course Content

##### **MODULE I: NUMBER SYSTEM, ALGORITHMS AND FLOWCHART (15 Hrs)**

Binary number system – Binary arithmetic, conversion to/from binary number, binary coding system; algorithms and flowcharts – types of algorithms, properties of good algorithm, pseudocode, flowcharts; software – software in information technology, computer programming – steps, planning, procedure, methods, testing; C-language – benefits, execution of program, development of C-language.

##### **MODULE II: BASICS OF C PROGRAMMING AND DECISION MAKING (15 Hrs)**

Basic structure of C programs, constants, variable and data types, operators and expressions, managing input and output operations, Decision Making and branching: If statements - simple if, if..else, nesting of if..else, else if ladder; switch statement, conditional operator, goto statement; Decision making and looping: while statement, do statement, for statement, jumps in loops.

##### **MODULE III: ARRAYS, STRINGS AND USER-DEFINED FUNCTIONS (15 Hrs)**

Arrays: one-dimensional arrays, two-dimensional arrays, character arrays and strings - declaring, initializing, reading and writing of strings, arithmetic operations on characters, String manipulation functions; need for user-defined functions, structure of a multi-function program, functions – elements, definition, return values and their types, function calls, function declaration, categories of functions, recursion

##### **MODULE IV: STRUCTURES, UNIONS, POINTERS AND FILES (15 Hrs)**

Structures - declaring, accessing, initializing, copying and comparing structure variables, arrays of structures, arrays within structures, structures and functions, unions; pointers – accessing the address of a variable, declaring pointer variables, initializing pointer variables, accessing a variable through its pointer; file management in C -opening, closing, input and output operations on files.

#### 5. References

1. Programming with C, by Byron S. Gottfried, Schaum's Outline Series, 2E
2. Let Us C, by Yashwant Kanetkar, BPS Publications, 13E,
3. Programming in ANSI C, by Balaguruswamy, McGraw Hill Education, 7E
4. C Programming Language, by Brian W. Keringhan, Dennis M Ritchie, Pearson Publications, 2E

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**6. Syllabus Focus****a) Relevance to Local, Regional, National and Global Development Needs**

Local /Regional/National /Global Development Needs	Relevance
Global Development	C is an adaptable, effective, and performance-driven language and is widely employed in everything from system software to game development.

**b) Components on Skill Development/Entrepreneurship Development/Employability**

SD/ED/EMP	Syllabus Content	Description of Activity
SD	Modules 1 and 2	Designing algorithms, flowcharts and writing C programs for given algorithm
EMP	Modules 3 and 4	Testing programming skills in C, including using its libraries and troubleshooting code

**7. Pedagogy**

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Participative	Seminars
2.	Experimental	Quiz
3.	Problem solving	Case Studies

  
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**8. Course Assessment Plan****a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination**

<b>CO</b>	<b>Continuous Internal Assessments CIA -40%</b>	<b>End Semester Examination-60%</b>
CO1	CIA 1 – Written Test	Written Exam
CO2	CIA 2 – Written Test	
CO3	CIA 2 – Written Assignment	
CO4	CIA 3 – Lab Test	

  
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**b) Model Question Paper- End Semester Exam****PROGRAMMING IN C****Course Code: U24/CSC/DSC/101****Max. Time:2hrs****Credits:4****Max.Marks:60****Section A****I: Answer any Four:****4 x 10 = 40 M**

1. What are the different symbols used in flow charts? Design a flow chart to find the maximum of three numbers

OR

2. Distinguish between pseudocode and algorithms. Write an algorithm to display the multiplication table of a given number

3. Explain the following operators used in C programming with examples.

a) Arithmetic Operators b) Logical Operators c) Conditional Operators

OR

4. Differentiate between if else if and switch case. Write a program to read marks in one subject and print grade

5. What are arrays? Explain two-dimensional array with an appropriate program

OR

6. Elaborate the need for recursion. Write a program to print factorial of a number using recursion.

7. Explain the difference between structure and union with an example.

OR

8. What is meant by opening a data file? How is this accomplished?

**Section B****II. Answer any Four:****4 x 5 = 20M**

9. Explain the difference between decimal and binary number systems. Convert the numbers 125 and 342 to binary

10. What are format specifiers? Explain the printing of different data type elements using format specifiers

11. What is the purpose of the scanf function? How is it used within a C program?

12. Differentiate while loop and do-while loop?

13. Write a program to accept and print single dimensional array

14. What are strings? Write a C program to combine two strings

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**PROGRAMMING IN C  
PRACTICAL**

**1. Course Description****Programme: B.Sc.****Max. Hours: 30****Course Code: U24/CSC/DSC/101/P****Hours per week: 2****Course Type: DISCIPLINE SPECIFIC CORE****Max. Marks: 50****No. of credits: 1****2. Course Objective:**

- To Introduce the Fundamental Concepts of Programming through C Language.

**3. Course Outcomes:****CO1: To Design Simple Algorithms for Arithmetic and Logical Problems.****CO2: To Understand Conditional Branching, Iteration, Recursion, Arrays, Structures and Unions**

**PRACTICAL SESSIONS**

1. Program to display Area, Perimeter of circle.
2. Program to calculate Simple Interest by accepting data
3. Program to display all Data types supported by C
4. Program to find Greatest of 3 numbers using Relational operator
5. Program to swap two numbers i) using third variable ii) without using third variable
6. Program to find Minimum of 3 numbers using Ternary operator (conditional Operator)
7. Program to find Sum of first “n” Even numbers using While loop.
8. Program to find out whether given number is palindrome or not using do while
9. Program to find the Factorial of given number using for loop
10. Program to perform Arithmetic operations using Switch case
11. Program to generate Fibonacci series.
12. Program to read an array, display the elements in the in reverse order
13. Program to find maximum number in an array
14. Program to find the Factorial of given number using recursion
15. Program to illustrate all String functions

**PROGRAMMING IN C  
PRACTICAL MODEL PAPER**

Course Code: U24/CSC/DSC/101/P

Time: 2Hrs

No. of Credits:1

Max Marks:50

Answer any two:

1. Write a C Program to find the greatest of three numbers.
2. Write a C program to find the factorial of a given number using recursion
3. Write a C program to add two matrices.

**c) Question Paper Blueprint**

Modules	Hours Allotted in the Syllabus	COs Addressed	Section A (No.of Questions)	Total Marks	Section B (No.of Questions)	Total Marks
I	15	1	2	10	1	5
II	15	2	2	10	1	5
III	15	3	2	10	2	5
IV	15	4	2	10	2	5

**9. CO-PO Mapping**

CO	PO	Cognitive Level	Classroom sessions(hrs)
1	1	2	15
2	2	3	15
3	2	5	15
4	1	6	15