

## **ABOUT UNIVERSITY**

Dr. C.V. Raman University was established on 3 November, 2006, in the district of Bilaspur, Chhattisgarh by the “All India Society for Electronics and Computer Technology” (AISECT), the Sponsoring Body. The University was named after the first Nobel Laureate of the country in the field of science – Dr. C.V. Raman, an Indian physicist efforts influenced in the growth of science in our country. The University's principle goal is to evolve a new cadre of highly skilled technical professionals with deep academic insights and a strong sense of Indian ‘Values and ethics’, commemorating our forefathers who helped shape this nation.

The Sponsoring Body of the University-All India Society for Electronics and Computer Technology (AISECT) is an ISO 9001:2008 certified organization, established in 1985 and is today’s one of The India's most reputed and trusted Education Groups which houses private Universities, Engineering Colleges, Professional Institutions & Education Centres across the country. Till date, AISECT has transformed the lives of over 19 lakh students and has uplifted the lives of millions of people in the community. AISECT has been lauded for its exceptional work and has won awards from the World Bank, NASSCOM, TiE, Government of India, Government of Madhya Pradesh and several others on account of its commitment to high quality education over the last 28 years. AISECT is also a partner institution with Gol, GoMP and GoCG in their Common Service Centre Program and several other projects of state and national concern.

## **MAIN OBJECTIVES**

- Provide quality higher education and make provisions for research
- Create higher levels of intellectual abilities among our students
- Establish state-of-the-art facilities for education, training and examination, including online training
- Carry out teaching, research and offer comprehensive learning for a bright professional career
- Create centers of excellence for R&D to promote an environment of innovation and research
- Provide consultancy to public organizations and the Industry
- Award and maintain the standard of degrees, diplomas, certificates and other academic distinctions in accordance with the norms laid down by UGC, AICTE, BCI, MCI and other regulatory bodies.

## **RECOGNITIONS**

- The University is recognized under Section 2(f) of the UGC Act.
- Joint Committee Approval of DEB(UGC/AICTE/DEB)
- Other recognitions include AICTE, NCTE, BCI and DEB
- It is the first University in the state of Chhattisgarh to be awarded an ISO: 9001-2008 Certification.
- Membership of the Association of Indian Universities (AIU)
- NACC B+

## **THE FACULTIES OF STUDIES**

The University has wide range of faculties which offers the traditional as well as the new era job oriented courses. The main emphasis is on providing a wide choice of courses at different levels. The following faculties currently are in operation in the University:

- Faculty of Arts
- Faculty of Commerce
- Faculty of Management
- Faculty of Science
- Faculty of Engineering
- Faculty of Information Technology
- Faculty of Education
- Faculty of Law

## **ABOUT INSTITUTE OF OPEN AND DISTANCE EDUCATION (IODE), CVRU**

Education determines the quality of our life to a great measure, especially professional life. However, for many, in some circumstances, the path to education is ridden with many obstacles, including location, geographical inflexibility and lack of time. Fortunately, distance education is changing that scenario by providing an effective alternative platform to learn new skills and acquire a degree, such as distance education MBA, without having to attend traditional classes.

We, a UGC/DEB approved distance university (1 may 2009), offer various undergraduate and post-graduate degrees, along with a number of diplomas, which have benefitted many distance learners.

Our distance learning programmes are the shining light that many have been looking for; they unite conventional teaching approaches, including course materials in the form of books, and modern teaching methodologies, which include online access to the course. Our unique approach has made us the centre of distance education in Chhattisgarh, helping scores of professionals to obtain a degree and fly high in their careers.

With our distance learning programmes, we are bringing people into the fold of skilled workforce, which has changed the life of many.

What makes us a distinguished Chhattisgarh distance education university?

- Reaching various far-flung regions of the state through information technology
- Providing professional education, need- and knowledge-based
- Setting new national standards in distance education

### **IMPORTANT ACHIEVEMENTS**

- AN ISO 9001: 2008 Certified University
- NIRF Ranking Under Top 200 University
- World Education Award
- Largest Network for Learning Support System.
- Declaration of Term end result Time to Time.
- Best in Skill Development Award 2015
- Best University in Open Distance and online Award 2017

### **ACADEMIC PROGRAMMES OFFERED BY THE UNIVERSITY IN OPEN AND DISTANCE LEARNING MODE**

The University offers through the Institute of Open and Distance Education (IODE) both short term and long term programmes leading to Certificates, Diploma and Degrees, which are conventional as well as innovative. Most of these programmes have been developed after an initial survey of the demand for such Programmes in the job market. They are launched with a view to fulfil the learner's need for skill and employability.

- Certification,
- Improvement of skills,
- Acquisition of professional qualifications,
- Continuing education and professional development at work place,
- Self-enrichment,
- Diversification and updation of knowledge, and
- Empowerment.

### **PROMINENT FEATURES OF THE OPEN AND DISTANCE EDUCATION AT CVRU**

The open and distance education at the Dr. C. V. Raman University has certain unique features such as

- Individual study - flexible in terms of place, pace and duration of study.
- Use of latest information and communication technologies.
- Modular approach to programmes.
- Cost-effective programmes.
- Socially and academically relevant programmes based on students need
- Convergence of open and conventional education systems.
- Take higher-education to the unreached sections of the society through the use of information technology.
- Provide need and knowledge-based professional education.
- Set the national standards for Distance Education.

### **PROGRAMME DELIVERY MODE**

The methodology of instruction in the distance learning mode in the university is different from that of the conventional regular programs. The system adopted for this more learner oriented and the learner is an active participant in the pedagogical process. Most of the instructions are imparted through distance education methodology and face to face mode as per requirement. The programme delivery methodology used in the distance learning mode follows a multimedia approach for instructions, which comprises:

- **Self Instructional Written Material:** The printed study material (written in self instructional style) for both theory and practical components of the programs is supplied to the learners in batches for every course.
- **Audio-Visual Material Aids:** The learning package contains audio and video CDs which have been produced/adopted by the University for Better Clarification and enhancement for understanding of the course material given to the learners. A video programme is normally of 25-30 minutes duration. The video cassettes are screened at the learner support centre during specific sessions which are duly notified for the benefit of the learners.
- **Counseling Sessions:** Normally counseling sessions are held as per schedule drawn by the IODE DR. C. V. RAMAN UNIVERSITY. These are mostly held outside the regular working hours of the learner support centre.
- **Teleconferences:** Live teleconferencing sessions are conducted via Internet/ satellite through interactive Video Conferencing facility (available at some places) from the University studios, the schedule of which is made available at the learner support centre.
- **Industrial Training/Practical/Project work:** Some programmes have industrial training/practical/ project component also. Practical are held at designated institutions for which schedule is provided by the learner support centre. Attendance at practical is compulsory. For Project Work, comprehensive project guide, in the form of booklet, is provided to the student along with the study material.

- The printed study materials will be dispatched periodically to the enrolled students for each paper of study. These materials will be as guide for the students for effective learning. The assignment for internal assessment shall also be dispatched along with the study material. Online modules are also available for some courses. These are in progress and as and when available, these will be available on the website of the students for registered candidates.
- The counseling sessions will be of 30 days duration for a course in a year. The actual schedule and place of contact program shall be announced and communicated to students in – time.

### **EVALUTION SYSTEM**

The system of evaluation in open and distance learning system has a multi-tier system of evaluation.

1. Self-assessment exercise within each unit of study.
2. Continuous evaluation mainly through assignments which are tutor-marked practical assignments and seminar/workshop/extended.
3. The term-end examinations.
4. Project work.

The evaluation of learners depends upon various instructional activities undertaken by them. A learner has to write assignment responses compulsorily before taking term-end examination from time to time to complete an academic programme. A learner has to submit TMA responses to the learner support centre established by IODE Dr. C. V. Raman University. A learner should keep duplicate copies of assignments responses of TMA that may be required to be produced at Student Evaluation Division on demand. Term-end examination will be conducted at various examination centre approved by institute of open and distance education Dr. C. V. Raman university spread all over the Chhattisgarh. The weightage for Term End Examination will be 70% and weightage for Internal Assessment will be 30 % for this programme.

### **TERM-END EXAMINATION AND PAYMENT OF EXAMINATION FEE**

The University conducts Term-end Examination in semester system and held in the month of Nov/Dec and May/June every year. Students will be permitted to appear in term-end examination subject to the conditions that:

1. Registration for the courses, in which they appeared is valid,
2. Minimum Time to pursue these courses is elapsed.
3. Submission of required number of assignment in respective courses by the due date.

Students can also submit on-line examination form as per guidelines through website at [www.cvrु.ac.in](http://www.cvrु.ac.in). Examination fee is required to be paid online payment gateway as per the fee

table. Please do all correspondence regarding the course admission and other detail at the following address:

The Director

Institute of Open and Distance Education (IODE)

Dr. C. V. Raman University

Kargi Road, Kota, Bilaspur, Chhattisgarh

Phone: 07753253851, 8827920016, 8827920019

Email: [cvrusd@gmail.com](mailto:cvrusd@gmail.com)

**LEARNER SUPPORT DESK:**

Phone: 07753253872, 07753-253873, 8359050061

Email: [cvrusd@gmail.com](mailto:cvrusd@gmail.com)

# PROGRAMME GUIDE

## DISTANCE EDUCATION PROGRAMMES

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### BACHELOR OF SCIENCE (B. Sc.)-CS

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- **Scheme of Examination**
- **Detailed Syllabus, Practical & Reference Book**
- **Counseling and Study Structure**
- **Study Modules & Books Information**
- **Date Schedule & Instructions for Submitting Assignments**



**INSTITUTE OF OPEN AND DISTANCE EDUCATION (IODE)**  
**DR. C.V.RAMAN UNIVERSITY**

KARGI ROAD, KOTA, BILASPUR, CHATTISGARH

PHONE : 07753-253851, 8827920016, 8827920019 FAX : 07753-253728

E-mail: [cvruidd@gmail.com](mailto:cvruidd@gmail.com), Website: [www.cvrui.ac.in](http://www.cvrui.ac.in)

**BACHELOR OF SCIENCE (B.Sc.) –COMPUTER SCIENCE GROUP**

**Duration: 36 Months**

**Eligibility: 12<sup>th</sup> Pass from Maths Subjects**

**SCHEME OF EXAMINATION**

Subject Code	Subjects	Credit	Total Marks	Theory		Practical Marks		Assignments	
				Max	Min	Max	Min	Max	Min
<b>FIRST SEMESTER</b>									
1BSCCS1	Hindi Bhasha aur Sanrachna	2	50	35	12	-	-	15	5
1BSCCS2	Fundamentals of Entrepreneurship	2	50	35	12	-	-	15	5
1BSCCS3	Physics-I	4	150	70	23	50	17	30	10
1BSCCS4	Fundamental Of Computing	4	150	70	23	50	17	30	10
1BSCCS5	Mathematics-I	4	100	70	23	-	-	30	10
<b>Total</b>		<b>16</b>	<b>500</b>	<b>280</b>	<b>101</b>	<b>100</b>	<b>36</b>	<b>120</b>	<b>43</b>
<b>SECOND SEMESTER</b>									
2BSCCS1	English Language and Indian Culture	2	50	35	12	-	-	15	5
2BSCCS2	Development of Entrepreneur	2	50	35	12	-	-	15	5
2BSCCS3	Physics-II	4	150	70	23	50	17	30	10
2BSCCS4	Programing With C	4	150	70	23	50	17	30	10
2BSCCS5	Mathematics -II	4	100	70	23	-	-	30	10
<b>2Total</b>		<b>16</b>	<b>500</b>	<b>280</b>	<b>101</b>	<b>100</b>	<b>36</b>	<b>120</b>	<b>43</b>
<b>THIRD SEMESTER</b>									
3BSCCS1	Hindi Bhasha Avam Samvedena	2	50	35	12	-	-	15	5
3BSCCS2	Environmental Study-I	2	50	35	12	-	-	15	5
3BSCCS3	Physics-III	4	150	70	23	50	17	30	10
3BSCCS4	Data Structure	4	150	70	23	50	17	30	10
3BSCCS5	Mathematics -III	4	100	70	23	-	-	30	10
<b>Total</b>		<b>16</b>	<b>500</b>	<b>280</b>	<b>101</b>	<b>100</b>	<b>36</b>	<b>120</b>	<b>43</b>
<b>FOURTH SEMESTER</b>									
4BSCCS1	English Language and Scientific Temper	2	50	35	12	-	-	15	5
4BSCCS2	Environmental Study-II	2	50	35	12	-	-	15	5
4BSCCS3	Physics-IV	4	150	70	23	50	17	30	10
4BSCCS4	DBMS	4	150	70	23	50	17	30	10
4BSCCS5	Mathematics -IV	4	100	70	23	-	-	30	10
<b>Total</b>		<b>16</b>	<b>500</b>	<b>280</b>	<b>101</b>	<b>100</b>	<b>36</b>	<b>120</b>	<b>43</b>
<b>FIFTH SEMESTER</b>									
5BSCCS1	Bhasha Kaushal Avam Sanchar Sadhan	2	50	35	12	-	-	15	5
5BSCCS2	Introduction to Computer Systems and Cyber Law-I	2	50	35	12			15	5
5BSCCS3	Physics-V	4	150	70	23	50	17	30	10
5BSCCS4	Software Engineering	4	150	70	23	50	17	30	10
5BSCCS5	Mathematics -V	4	100	70	23	-	-	30	10
<b>Total</b>		<b>16</b>	<b>500</b>	<b>280</b>	<b>101</b>	<b>100</b>	<b>36</b>	<b>120</b>	<b>43</b>
<b>SIX SEMESTER</b>									
6BSCCS1	English Language and Aspects of Development	2	50	35	12	-	-	15	5
6BSCCS2	Introduction to Computer Systems and Cyber Law-II	2	50	35	12			15	5
6BSCCS3	Physics-VI	4	150	70	23	50	17	30	10
6BSCCS4	Java	4	150	70	23	50	17	30	10
6BSCCS5	Mathematics -VI	4	100	70	23	-	-	30	10
<b>Total</b>		<b>16</b>	<b>500</b>	<b>280</b>	<b>101</b>	<b>100</b>	<b>36</b>	<b>120</b>	<b>43</b>

### **Evaluation Scheme**

1. 33% in each theory, practical, project, dissertation & internal assessment but the total Aggregate for passing is 36%.



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**SEMESTER- 1<sup>st</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: HINDI BHASHA AUR SANRACHNA**  
**COURSE CODE: 1BSCCS1, CREDIT:2**

**THEO. MAX. M: 35 MIN. M: 12**  
**ASSIG. MAX. M: 15 MIN. M: 5**

**इकाई-1**

भारत वंदना (काव्य)	सूर्यकांत त्रिपाठी 'निराला'
जाग तुझको दूर जाना	सुश्री महादेवी वर्मा
स्वतंत्रता पुकारती (काव्य)	जयशंकर 'प्रसाद'
हम अनिकेतन (काव्य)	बालकृष्ण शर्मा 'नवीन'
भाषा की महत्ता और उसके विविध रूप	
भाषा-कौशल	

**इकाई-2**

करुणा (निबंध)	आचार्य रामचन्द्र शुक्ल
समन्वय की प्रक्रिया (निबंध)	रामधारी सिंह 'दिनकर'
बिच्छी बुआ (कहानी)	डॉ. लक्ष्मण विष्ट 'बटरोही'
अनुवाद	परिभाषा प्रकार, महत्व, विशेषताएं
हिन्दी की शब्द-संपदा	
परिभाषिक शब्दावली	

**इकाई-3**

विलायत पहुंच ही गया (आत्मकथांश)	महात्मा गांधी
अफसर (व्यंग्य)	शरद जोषी
तीर्थयात्रा (कहानी)	डॉ. मिथिलेश कुमार मिश्र
मकड़ी का जाला (व्यंग्य)	डॉ. रामप्रकाश सक्सेना
वाक्य-संरचना: तत्सम, तद्भव देशज विदेशी	

**इकाई-4**

अप्प दीपो भव (वक्तृत्व कला)	स्वामी श्रद्धानंद
भारत का सामाजिक व्यक्तित्व (प्रस्तावना)	जवाहरलाल नेहरू
पत्र मैसूर के महाराजा को (पत्र-लेखन)	स्वामी विवेकानंद
बनी रहेंगी किताबें (आलेख)	डॉ. सुनीता रानी घोष
पत्र-लेखन: महत्व और उसके विविध रूप	
सड़क पर दौड़ते ईहा मृंग (निबंध)	डॉ. श्यामसुन्दर दुवे

इकाई-5

योग की शक्ति (डायरी)

कोश के अखाड़े में कोई पहलवान नहीं उतरता(साक्षात्कार)

नीग्रो सैनिक से भेंट (यात्रा-संस्मरण)

यदि बा न होती तो शायद गांधी को

यह ऊँचाई न मिलती (साक्षात्कार) 5 कथाकार

सर-लेखन, भाव-पल्लवन साक्षात्कार और कौशल

डॉ. हरिवंशराय बच्चन

भाषाविद् डॉ. हरदेव बाहरी से प्रो.त्रिभुवननाथ शुक्ल

डॉ. देवेन्द्र सत्यार्थी

गिरिराज किशोर से सत्येन्द्र शर्मा

**TEXT AND REFERENCE BOOK**

- भारतीयता कें अमर स्वर, मध्य प्रदेश हिन्दी ग्रंथ अकादमी



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**SEMESTER- 1<sup>st</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**THEO. MAX. M: 35 MIN. M: 12**

**COURSE: FUNDAMENTALS OF ENTREPRENEURSHIP**

**ASSIG. MAX. M: 15 MIN. M: 5**

**COURSE CODE: 1BSCCS2, CREDIT:2**

**UNIT-I**

Entrepreneurship-Definition, Characteristics and importance, Types and functions of an entrepreneur, merits of a good entrepreneur motivational factors of entrepreneurship.

**UNIT-II**

Motivation to achieve targets and establishment of ideas. Setting targets and facing challenges. Resolving problems and creativity. Sequenced planning and guiding capacity, Development of self confidence. Communication skills, Capacity to influence, leadership.

**UNIT-III**

Project Report- Evaluation of selected process. Detailed project report - Preparation of main part of project report pointing out necessary and viability. Selecting the form of Organization: Meaning and characteristics of sole Proprietorship, Partnership and cooperative committees, elements affecting selection of a form of an organization. Economic management -Role of banks and financial institutions banking, financial plans, working capital-evaluation and management, keeping of accounts.

**UNIT IV**

Production management - Methods of purchase. Management of movable assets/goods. Quality management. Employee management. Packing. Marketing management Sales and the art of selling. Understanding the market and market policy. Consumer management. Time management.

**UNIT-V**

Role of regulatory institutions - district industry centre, pollution control board, food and drug administration, special study of electricity development and municipal corporation. Role of development organizations, khadi & village Commission/ Board, State Finance Corporation, scheduled banks, MP Women's Economics Development Corporation. Self-employment-oriented schemes, Prime Minister's Employment schemes, Golden Jubilee Urban environment scheme, Rani Durgavati Self-Employment scheme, Pt. Deendayal Self-employment scheme.

Various grant schemes - Cost-of-Capital grant, interest grant, exemption from entry tax, project report, reimbursement grant, etc. Special incentives for women entrepreneurs, prospects & possibilities. Schemes of Tribal Finance Development Corporation, schemes of Antyavasai Corporation, schemes of Backward Class and Minorities Finance Development Corporation.

#### **TEXT AND REFERENCE BOOK**

- Amrit Tiwana ,The Knowledge Management tool kit,Pearson Education.
- Lunlin Conlson, Knowledge Entrepreneur, Thomas Press.
- Catheriue L Mann, Knowledge entrepreneurship, Oxford.
- Heinke Robkern ,Knowledge entrepreneurship,.
- Bonnie Montano,Knowledge Management, , IRM Press, London.



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**SEMESTER- 1<sup>ST</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: PHYSICS-I**  
**COURSE CODE:1BSCCS3, CREDIT:4**

**THEO. MAX. M: 70 MIN. M: 23**  
**ASSIG. MAX. M: 30 MIN. M: 10**  
**PRACTICAL MAX.M:50 MIN.M:17**

**UNIT-I**

Mechanics: Laws of motion, centripetal acceleration, Coriolis force and its applications. Kepler's laws. Gravitational law and field,. Gauss & Poission's Equation of Gravitational self-energy System of. particles,, centre, of mass, equation of motion, conservation of linear and angular, momentum, conservation of energy, single stage and multistage rockets, elastic and inelastic collisions.

**UNIT-II**

Oscillations: differential equation and its solution, kinetic and potential energy, simple harmonic oscillations and its examples, spring and mass system, Vibrations of a magnet, moments of inertia and their products, principal moments and axes, Euler's equations simple and compound pendulum torsional pendulum, Helmholtz resonator,LC circuit.

**UNIT-III**

Superposition Of Harmonic Motion : Superposition of two simple harmonic motions of the same frequency along the same line, interference, superposition of two mutually perpendicular simple harmonic vibrations of the same frequency, Lissajous figures, damped harmonic oscillators, power dissipation, quality factor and their examples, driven harmonic oscillator.

**UNIT-IV**

Properties of matter: Elasticity, Hook's Law, elastic constants for an isotropic solid beams supported at both the ends, cantilever, torsion of a cylinder bending moments and shearing forces. Kinematics of moving fluids, equations of continuity Euler's equation, Bernoulli's theorem, viscous fluids, streamline and turbulent flow, Poiseulle's law, Capillary tube flow, Reynold's number, Stokes law Surface tension and surface energy. surface wetting.

**UNIT-V**

Motion of charged Particles in Electric and Magnetic Fields : E as an accelerating field, electron gun, case of discharge tube, linear accelerator. E as deflecting field- CRO, sensitivity

of CRO. Transverse B field;  $180^\circ$  deflection, mass spectrograph. principles of cyclotron. discovery of isotopes, elements of mass spectrographs, principle of magnetic focusing (lenses).

#### **TEXT AND REFERENCE BOOK**

- “Mechanics” J.C. Upadhyay, (Prgati Prakasan meerut)
- “Mechanics” D.S. Mathur, S. Chand & co. Delhi
- “Vibration and Waves” K.K. Srivastava, Anusandhan Prakashan Kanpur
- “Oscillations and Waves” Satya Prakash, Prgati Prakasan meerut
- “Unified Physics” R. P. Goyal, Shiv Lal Agrawal & co. Agra
- “Yugbodh Physics Patel & Verma” Yugbodh Prakashan Raipur



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**SEMESTER- 1<sup>st</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: FUNDAMENTAL OF COMPUTING**  
**COURSE CODE:1BSCCS4, CREDIT:4**

**THEO. MAX. M: 70 MIN. M:23**  
**ASSIG. MAX. M: 30 MIN. M:10**  
**PRACTICAL MAX.M:50 MIN.M:17**

**UNIT-I**

Introduction to Information Technology: Basic concepts of IT, Data Processing: Data and Information. Introduction to Computers: Classification, History, Types of Computers. Elements of a Computer System: Block Diagram of The Computer System.

**UNIT –II**

Introduction to various units. Hardware: CPU, Memory, Input and Output devices, Auxiliary storage devices. Software: System and Application Software, Utility packages, Configuration of Computer System Applications of Information Technology: Wide range of applications in: Home, Education and Training, Entertainment, Science, Medicine, Engineering etc.

**UNIT-III**

Introduction to Information Technology Tools : Operating System, Programming Languages, Features and trends. Introduction to MS-DOS/WINDOWS/LINUX/UNIX Office Automation Tools: MS-Office, Word, Powerpoint, Excel, Access, Working with PC PACKAGES. Translators: Assembler, Compiler and Interpreter.

**UNIT-IV**

Business Files: Concept of Character, Field, Record and File. Types of Data Files: Master File, Transaction File, Archival File. Keys: Primary Key, Secondary key, Foreign key etc. File Organization: Sequential file, Indexed Sequential file, Random files. Comparison of various type of file organization. Choice of Files Organization, Design of Computer Data Files, Files Security and Back-Up.

**UNIT-V**

Computers and Communication: Introduction to Computer Networks, Internet and World Wide Web, FTP, Electronic Mail.

Web Development Tools : FrontPage, HTML. Information Security and Integrity: Basic Concepts, Perverse Software.

Preventive Measures and treatments. Laboratory : Working with DOS, Linux/Unix and Windows O.S., MS-Office, Web Design using HTML and FrontPage.

## TEXT AND REFERENCE BOOK

- Sanders, D.H., "Computer Today ", Mc-Graw Hill, 1988.
- Suresh K. Basandra, "Computers Today", Galgotia Publications Pvt. Ltd.
- Microsoft Web Publishing Step by Step, Active Education.
- Bokhari& Ahmad "UNIX Operating System", DhanpatRai& Co.
- Raja Raman V., "Fundamental of Computers" (4th edition.), Prentice Hall of India, New Delhi.
- B. Ram, "Computer Fundamentals", New Age International Pvt. Ltd.
- S. Jaiswal, "Fundamental of Computer & IT", Wiley dreamtech India.



**Dr. C.V. RAMAN UNIVERSITY**  
**Institute of Open and Distance Education (IODE)**  
 Kargi Road, Kota, Bilaspur (C.G.)

**SEMESTER- 1<sup>st</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: MATHEMATICS – I**  
**COURSE CODE:1BSCCS5, CREDIT:4**

**THEO. MAX. M: 70 MIN. M:23**  
**ASSIG. MAX. M: 30 MIN. M:10**

**UNIT-I**

Rank of a matrix. Eigen values, eigen vectors. Characteristic equation of a matrix. Cayley Hamilton theorem and its use in finding inverse of matrix. Application of matrix to a system of linear ( both homogenous and non - homogenous) equations. Theorems on consistency and inconsistency of a system of linear equations. Solving the linear equations with three unknowns. Relation between the roots and coefficients of a general polynomial equation in one variable. Transformation of equations, Descartes's rule of signs.

**Unit-2** : De Moivre's theorem and its application. Direct and inverse circular and hyperbolic functions, Expansion of trigonometrical function. Gregory's Series, Summation of Series,

**Unit-3** : Definition and basic properties of group. Order of an element of a group. Subgroups, algebra of subgroups. Cyclic groups and their simple properties. Coset decomposition and related theorems. Lagrange's theorem and its consequences, Normal sub groups, quotient groups.

**Unit-4** : Homomorphism and isomorphism of groups, kernel of Homomorphism and fundamental theorem of Homomorphism of groups Permutation groups (even and odd permutations) Alternating groups  $A_n$ , Cayley's theorem. Introduction to rings, subrings, integral domains and fields, simple properties and examples.

**Unit-5** : General equation of second degree. Tracing of conics. Equation of cone with given base, generators of cone, condition for three mutually perpendicular generators, Right circular cone. Equation of Cylinder and its properties. Right circular cylinder, enveloping cylinder and their properties Central conicoids, Paraboloids. Plane sections of Conicoids.

**TEXT AND REFERENCE BOOK**

1. H.K. Pathak Algebra & Trigonometry, Geometry; Shiksha Sahitya a Prakashan, Meerut.
2. P.B. Bhattacharya, S.K. Jain & S.R. Nagpaul Abstract algebra, Cambridge University.
3. K.B. Dutta, Matrix & Linear algebra, Pvt. Lmt.
4. B.R. Thakur, Algebra & Geometry.





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**SEMESTER- 1<sup>st</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**PRACTICAL MAX.M:50 MIN.M:17**

**COURSE: FUNDAMENTAL OF COMPUTING LAB**

**LIST OF PRACTICAL'S**

- [MS-WORD] Creating, opening, closing, saving and editing a word Document.
- [MS-WORD] Insert header and footer in the document.
- [MS-WORD] Create a link between two files using Hyperlink.
- E- mail-merge and add data of 5 recipients.
- [MS-WORD] Protect a document.
- [MS-WORD] Implement macro.
- [MS-POWERPOINT] Create duplicate slides in PowerPoint. Give an example.
- [MS-POWERPOINT] Make a master slide.
- [MS-POWERPOINT] Design a chart of population.
- [MS-POWERPOINT] Insert Animation.
- [MS-POWERPOINT] Insert a background in PowerPoint.
- [MS-EXCEL] How you can filter your data.
- [MS-EXCEL] Sort data in ascending and descending order.
- [MS-EXCEL] To show the use of goal seek
- [MS-EXCEL] To show the use of scenarios.
- [MS-EXCEL] Perform any 5 Date and Time functions.
- [MS-EXCEL] Perform any 5 Math & Trig functions.

**TEXT AND REFERENCE BOOK**

1. Computer Fundamentals 6<sup>th</sup> Edition Pradeep Ku. Sinha & Priti Sinha, BPB Publications
2. MS-Office 2010 Training Guide Paperback, by Prof. Satish Jain (Author), M. Geetha (Author)



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**SEMESTER- 1<sup>st</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**PRACTICAL MAX.M:50 MIN.M:17**

**COURSE: PRACTICAL PHYSICS-I**

1. To determine the moment of inertia of fly-wheel about its own axis of rotation.
2. To determine the frequency of an electrically maintained tuning fork by Melde's method.
3. To study the variation of time  $t$  with length  $l$  for a compound pendulum ( Bar pendulum) and estimate the value of acceleration due to gravity.
4. To determine the value of acceleration due to gravity at a particular place by means of Kater's reversible pendulum.
5. To determine the surface tension of given liquid by using capillary rise method.
6. To verify the truth tables of various logic gates.
7. To determine the coefficient of viscosity of glycerin by falling sphere method.
8. Determination of moment of inertia using inertia table.
9. Determination of modulus of rigidity of given wire by torsional pendulum.
10. Study of Lissajous figures using cathode ray oscilloscope (CRO).

**TEXT AND REFERENCE BOOK**

1. Practical Physics, Dr. S.L. Gupta & Dr. V. Kumar, Pragti Prakashan Meerut
2. Degree level practical Physics, Sharma, Singh & Prashad, Bharti Bhawan Publication Patna-6.
3. Experiment in Engineering Physics-M.N. Awadhanulu, A.A. Dani & P.M. Pokle, S.Chand Pub. New Delhi.
4. Prabodh Prayogik Bhoutiki, Dr. P.K.Upadhayay, Yugbodh offset Pvt. Ltd. Raipur
5. A text book of Engineering Physics Practical Das, Robinson & Kumar University Science press New Delhi
6. Practical Physics, Chattopadhyay



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**SEMESTER- 2<sup>nd</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: ENGLISH LANGUAGE AND INDIAN CULTURE**  
**COURSE CODE: 2BSCCS, CREDIT:2**

**THEO. MAX. M: 35MIN. M:12**  
**ASSIG. MAX. M: 30 MIN. M:10**

**UNIT – I**

1. Amalkanti : Nirendranath Chakrabarti
2. Sita : Toru Dutt
3. Tryst with Destiny : Jawaharlala Nehru
4. Delhi in 1857 : Mirza Ghalib
5. Preface to the Mahabharata : C., Rajagopalachari
6. Where the Mind is Without Fear : Rabindranath Tagore
7. A Song of Kabir : Translated by Tagore
8. Satyagraha : M.K. Gandhi
9. Toasted English : R.K. Narayan
10. The Portrait of a Lady : Khushwant Singh
11. Discovering Babasaheb : Ashok Mahadevan

**Unit – II** Comprehension

**Unit – III** Composition and Paragraph Writing (Based on expansion of an idea).

**Unit – IV** Basic Language Skills: Vocabulary – Synonyms, Antonyms, Word Formation, Prefixes and Suffixes, Words likely to be confused and Misused, Words similar in Meaning or Form, Distinction between Similar Expressions, Speech Skills.

**Unit – V** Basic Language Skills: Grammar and usage – The Tense Forms, Propositions, Determiners and Countable/Uncountable Nouns, Verb, Articles, Adverbs.

**TEXT AND REFERENCE BOOK**

1. English Language and Indian Culture, published by M. P. Hindi Granth Academy
2. Essentials of English Grammar by Sultan Chand & Sons
3. English Grammar and Composition by Wren & Martin
4. Scholar's Senior English Grammar and Composition, T.R. Bhanot, H. Martin, Scholar Publishing House (P) Ltd.



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**SEMESTER- 2<sup>nd</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: DEVELOPMENT OF ENTREPRENEUR**  
**COURSE CODE:2BSCCS2,CREDIT:2**

**THEO. MAX. M: 35MIN. M:12**  
**ASSIG. MAX. M: 15MIN. M:5**

**Unit - I**

Entrepreneurship – Meaning, Concept, Characteristics of entrepreneur.

**Unit – II**

Types of entrepreneurship, importance and views of various thinkers (Scholars).

- Formation of goals, How to achieve goals.
- Problems in achieving targets and solution.
- Self motivation, elements of self motivation and development
- Views of various scholars, evaluation, solutions.

Leadership capacity : Its development and results.

**Unit – III**

Projects and various organizations (Govt., non-Govt), Govt. Projects, Non-Govt.projects.

Contribution of Banks, their limitations, scope.

**Unit – IV**

Functions, qualities, management of a good entrepreneur.

Qualities of the entrepreneur (Modern and traditional).

Management skills of the entrepreneur.

Motive factors of the entrepreneur.

**Unit – V**

Problems and Scope of the Entrepreneur:

- Problem of Capital

- Problem of Power
- Problem of registration
- Administrative problems
- Problems of Ownership.

**TEXT AND REFERENCE BOOK**

- Entrepreneurship development, K. Ramachandran, Publication- TMH Publishers.



**Dr. C.V. RAMAN UNIVERSITY**

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SEMESTER- 2<sup>nd</sup>

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**COURSE: PHYSICS – II**

**COURSE CODE: 2BSCCS3, CREDIT:4**

**THEO. MAX. M: 70MIN. M:23**

**ASSIG. MAX. M: 30 MIN. M:10**

**PRACTICAL MAX.M:50 MIN.M:17**

**Unit-1 Mathematical Background:** Scalars and vectors, dot and cross products, triple vector product, flux of a vector field, Gauss's divergence theorem. Green's theorem and Stoke's theorem. Functions of two and three variables, partial derivatives, definition of a double and triple integral, evaluation of double and triple integrals as repeated integrals, change of variables of integration, Jacobian applications.

**Unit-2 Electrostatics:** Coulombs law in vacuum expressed in vector forms, calculations of E for simple distributions of charge at rest, dipole and quadrupole fields. torque on a dipole in a uniform electric field and its energy, flux of the electric field, Gauss's law and its application. Capacitors, electrostatic field energy,. Dielectrics, parallel plate capacitor with a dielectric, dielectric constant, polarization and polarization vector, and displacement vector D, molecular interpretation of Clausius-Mossotti equation.

**Unit-3 Electric Currents:** Steady current, current density J, non-steady currents and continuity equation, Kirchoff 's laws and analysis of multiloop circuits, rise and decay of current in LR and CR circuits, decay constants, transients in LCR circuits. AC circuits, complex numbers and their applications solving AC circuits Problems, complex impedance and reactance, series and parallel resonance., Q factor, power consumed by an A.C. circuit, power factor,

**Unit-4 Magneto-statics:** Force on a moving charge: Lorentz force equation and definition of B, force on a straight conductor carrying current in a uniform magnetic field, torque on a current loop, magnetic dipole moment, angular momentum and gyromagnetic ratio, Biot and Savart's Law, Ampere's Law,  $\vec{\nabla} \times \vec{B} = \mu_0 \vec{J}$ ,  $\vec{\nabla} \cdot \vec{B} = 0$ ; Field due to a magnetic dipole magnetization current magnetization vector, Half order field, magnetic permeability (linear cases).

**Unit-5 Time Varying Fields :** Electromagnetic induction, Faraday's Laws, electromotive force  $\mathcal{E} = -\frac{d\Phi}{dt}$ , integral and differential forms of Faraday's laws. self and mutual inductance9.transformers,. Maxwell's displacement current, Derivations of Maxwell's equations, electromagnetic field energy density., Poynting's vector. The wave equation satisfied by E and B, plane electromagnetic waves in vacuum, polarization by reflection and total internal reflection. Faraday effect, reflection and refraction by the ionosphere.

**TEXT AND REFERENCE BOOK**

1. Electromagnetic Fields”. A.M. Portis
2. “Principles of Electricity and Magnetism” Pugh and Pugh, India Book House, Delhi.
3. “Unified Physics” R. P. Goyal
4. Prabodh Bhoutiki” Kher, Choube & Upadhyay.Yugbodh Offset Pvt. Ltd. Raipur.
5. Electricity and Magnetism , Mahajan & Rangwala TMH New Delhi
6. Electricity and Magnetism, JC Upadhyay, H.P. Sinha & S Upadhyay, Ram Prasad & Sons Agra
7. Foundation of magnetism & Electricity, DN Vashudeva S. Chand & Co. Delhi
8. Elements of Physics-Electrostatics, DP Singh & K Rai , Scientific book co. Patna.
9. Elements of Physics-Electricity, DP Singh & K Rai , Scientific book co. Patna
10. Elements of Vector Calculus, N. Sharma & R Prasad, Pothywala Pvt. Ltd. Allahabad
11. Electricity and Magnetism, Arora, Saxena & Prakash, Pragati Prakashan Meerut.



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**SEMESTER- 2<sup>nd</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: PROGRAMMING WITH C**  
**COURSE CODR:2BSCCS4, CREDIT:4**

**ASSIG. MAX. M: 30 MIN. M:10**  
**ASSIG. MAX. M: 30 MIN. M:10**  
**PRACTICAL MAX.M:50 MIN.M:17**

### **UNIT - 1 ELEMENTS OF C LANGUAGE**

Algorithm and Programming Development steps in development of a program, Flow charts, Algorithm

development, Program Debugging. Program Structure:-I/o statements, assign statements. Constants, variables and data types, Operators and Expressions, Standards and Formatted, Use of Header & Library files.

### **UNIT- 2 CONTROL STRUCTURES**

Introduction, Decision making with IF – statement, IF – Else and Nested IF, While and do-while, for loop,

Break and switch statements. Functions:-Introduction to functions, Global and Local Variables, Function Declaration, Standard functions, Parameters and Parameter Passing, Call – by value/reference, Recursion.

### **UNIT - 3 INTRODUCTION TO ARRAYS**

Array Declaration and Initialization, Single and Multidimensional Array. Arrays of Characters.

### **UNIT - 4 POINTERS**

Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers. Structures and Unions:-Declaration of structures, Accessing structure members, Structure Initialization, Unions.

### **UNIT- 5 STRINGS**

Introduction, Declaring and Initializing string variables, Reading and writing strings, String handling functions, Array of strings Files:- Introduction, File reading/writing in different modes, File manipulation using standard function types.

**TEXT AND REFERENCE BOOK**

1. Salaria RS, *Application Programming in C*, Khanna Book Publishing Co (P) Ltd. New Delhi.
2. Schaum Series, *Programming in C*, McGraw Hills Publishers, New York.
3. YashwantKanetkar, *Exploring* – BPB Publications, New Delhi.



**Dr. C.V. RAMAN UNIVERSITY**  
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**SEMESTER- 2<sup>nd</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: MATHEMATICS – II**  
**COURSE CODE:2BSCCS5,CREDIT:4**

**THEO. MAX. M: 70 MIN. M:23**  
**ASSIG. MAX. M: 30 MIN. M:10**

**UNIT-I:** Concept of Partial differentiation, Successive differentiation, Leibnitz theorem, Maclaurin and Taylor series expansions, Asymptotes and Curvature, Tests for concavity and convexity, Points of inflexion. Multiple points. Tracing of curves in cartesian and polar coordinates

**Unit-2** :Integration of irrational algebraic functions and transcendental functions. Reduction formulae. Definite Integrals. Quadrature, Rectification, Volumes and Surfaces of solids of revolution of curves.

**Unit-3** :Linear equations and equations reducible to the linear form, Exact differential equation First order higher degree equations for  $x, y, p$ , Clairaut's form and singular solutions. Linear differential equations with constant coefficients.

**Unit-4** :Homogenous linear ordinary differential equations, linear differential equations of second order. Transformation of the equation by changing the dependent variable and the independent Variable, Method of variation of parameters, Ordinary simultaneous differential equations.

**Unit-5** :Vector differentiation. Gradient, Divergence and Curl. Vector integration, Theorem of Gauss (without proof) and problems based on it. Theorem of Green (without proof) and problems based on it. Stoke's theorem (without proof) and problems based on it.

**TEXT AND REFERENCE BOOK**

1. H.K. Pathak Calculus.
2. Gorakh Prasad, Differential calculus, Pothishala Pvt. Ltd.
3. P.K. Jain & S.K. Kaushik, An introduction to Real Analysis. New Delhi.
4. Shanti Narayan, Vector Calculus, X.Chand & Co. New Delhi.
5. N.,Sharan & S.N. Nigam, Introduction to Vector Analysis, Pvt. Ltd. Alahabad.



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**SEMESTER- 2<sup>nd</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE : PROGRAMMING WITH C LAB**

**PRACTICAL MAX.M:50 MIN.M:17**

**LIST OF PRACTICALS:**

1. Write a Program (WAP) to calculate temperature in Fahrenheit to Celsius using formula  $C = (F-32)/1.8$ .
2. WAP to calculate Sum & average of N numbers.
3. WAP to convert integer arithmetic to a given number of day and month.
4. WAP to find maximum and minimum out of 3 numbers a, b & c.
5. WAP to find factorial of positive integer.
6. WAP to find sum of series up to n number,  $2+5+8+\dots+n$ .
7. WAP to print all the number between 1 to 100 which are dividing by 7.
8. WAP to generate Fibonacci series up to n.
9. WAP to find position in class first =360, second=240, third=120 otherwise fail. Read marks of 3 subjects.
10. Write an iterative function to calculate factorial of given number.
11. Write a recursive function to calculate factorial of given number.
12. WAP to find whether number is prime or not.
13. WAP to find even & odd up to a given limit.
14. WAP to find addition of two matrix of  $n*n$  order.
15. WAP to find multiplication of two matrix of  $n*n$  order.

**REQUIRED SOFTWARE/ SOFTWARE TOOL:**

1. Linux Operating System and/ or Windows Operating System
2. Turbo C/C++ IDE.

**TEXT AND REFERENCE BOOK**

1. C Programming Laboratory by Dr. Nandini S. Sidnal, Wiley India, 2012



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**SEMESTER- 2<sup>nd</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: PRACTICAL PHYSICS -II**

**PRACTICAL MAX.M:50 MIN.M:17**

**LIST OF PRACTICALS**

1. To plot graphs showing the variation of magnetic field with distance along the axis of a circular coil carrying current and to estimate from it the radius of the coil.
2. To determine the mechanical equivalence of heat J by callender and Barnes method.
3. Calculation of Impedance, Phase angle and power factor using LCR impedance circuit kit.
4. To determine the resistance per unit length of the Carey-foster bridge wire.
5. Study of charge conduction in electrostatics.
6. Study and verification of inverse square law by using photo cell kit.
7. Verification of Coulomb's law.
8. Study and analysis of Ballistic galvanometer.
9. Measurement of dielectric constant of different materials.
10. Verification of Biot-Savert's law.

**TEXT AND REFERENCE BOOK**

1. Practical Physics, Dr. S.L. Gupta & Dr. V. Kumar, Pragti Prakashan Meerut
2. Degree level practical Physics, Sharma, Singh & Prashad, Bharti Bhawan Publication Patna-6.
3. Experiment in Engineering Physics-M.N. Awadhanulu, A.A. Dani & P.M. Pokle, S.Chand Pub. New Delhi.
4. Prabodh Prayogik Bhoutiki, Dr. P.K.Upadhayay, Yugbodh offset Pvt. Ltd. Raipur
5. A text book of Engineering Physics Practical Das, Robinson & Kumar University Science press New Delhi
6. Practical Phywsics, Chattopadhyay



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**SEMESTER- 3<sup>rd</sup>**

**PROGRAMME: B.SC.COMPUTER SCIENCE**  
**COURSE: HINDI BHASHA AVAM SAMVEDENA**  
**COURSE CODE: 3BSCCS1, CREDIT:2**

**THEO. MAX. M: 23MIN. M:12**  
**ASSIG. MAX. M: 15 MIN. M:5**

इकाई एक.

1. आचरण की सभ्यता : सरदार पूर्ण सिंह
2. जवानी )काव्य (: श्री माखनलाल चतुर्वेदी
3. विज्ञान : परिभाषा , शाखाएँ , संक्षिप्त इतिहास
4. सपनों की उड़ान : एजे.पी . अब्दुल कलाम
5. प्रमुख वैज्ञानिक आविष्कार और हमारा जीवन
6. त्रुटि संशोधन

इकाई दो.

1. शिरीष के फूल-निबंध : आचार्य हजारी प्रसाद द्विवेदी
2. विकास का भारतीय मॉडलर: धर्मपाल
3. निबंध लेखन की कला
4. संधि समास.: संरचना और प्रकार
5. निराला : संस्मरण - महादेवी वर्मा

इकाई तीन.

1. मांडव )यात्रा वृत्तांत(: पं. रामनारायण उपाध्याय
2. हिन्दी भाषा का मानकीकरण
3. भारतीय कृषि
4. जीवन : उद्भव और विकास
5. जनजातीय जीवन
6. उसने कहा था) कहानी (: श्री चन्द्रधर शर्मा गुलेरी

इकाई चार.

1. महाजनी सभ्यता) निबंध (: प्रेमचन्द
2. मुहावरे और लोकोक्तियाँ
3. सौर मण्डल
4. ब्रह्मण्ड और जीवन

5. शिकागो )व्याख्या (: स्वामी विवेकानंद
6. संक्षिप्तियां  
इकाई पांच.

1. मध्यप्रदेश एवं छत्तीसगढ के पर्यटन स्थल
2. फिल्टर तो चाहिए ही. डॉ. देवेन्द्र दीपक
3. भारतीय वनस्पतियाँ और जीव
4. पर्यावरण
5. भोलाराम का जीवन (व्यंग्य) हरिशंकर परसाई
6. टाँगन का पंछी : विद्यानिवास मिश्र

### **TEXT AND REFERENCE BOOK**

- हिन्दी भाषा एव संवेदना , मध्य प्रदेश हिन्दी ग्रंथ अकादमी



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SEMESTER- 3<sup>rd</sup>

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: ENVIRONMENTAL STUDY-I**  
**COURSE CODE:3BSCCS2,CREDIT:2**

**THEO. MAX. M: 23MIN. M:12**  
**ASSIG. MAX. M: 15 MIN. M:5**

**UNIT – I Study of Environmental and ecology :**

- (a) Definition and Importance.
- (b) Environmental Pollution and problems.
- (c) Public participation and Public awareness.

**UNIT – II Environmental Pollution :**

- (a) Air, water, noise, heat and nuclear pollution.
- (b) Causes, effect and prevention of pollution.
- (c) Disaster management – Flood, Earthquake, cyclones and landslides.

**UNIT – III Environment and social problems :**

- (a) Development – non-sustainable to Sustainable.
- (b) Energy problems of cities.
- (c) Water preservation – rain-water collection.

**UNIT – IV Role of mankind in conserving natural resources :**

- (a) Food resources – World food problem.
- (b) Energy resources – increasing demand for energy.
- (c) Land resources – Land as resources.

**UNIT – V Environment conservation laws :**

- (a) Conservation laws for air and water pollution.
- (b) Wildlife conservation laws.
- (c) Role of information technology in protecting environment & health.

**TEXT AND REFERENCE BOOK**

1. Environmental Science & Engineering, R.Anandan R. Kumaravelan, Scitech Publication (India)Pvt. Ltd.
2. Environment & Ecology, Dr. J.P.Sharma, Laxmi Publication.



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**SEMESTER- 3<sup>rd</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**COURSE: PHYSICS-III**

**COURSE CODE:3BSCCS3, CREDIT:4**

**THEO. MAX. M: 70 MIN. M:23**

**ASSIG. MAX. M: 30 MIN. M:10**

**PRACTICAL MAX.M:50 MIN.M:17**

**Unit-1** Kinetic Theory of Gases: Ideal Gas: Kinetic model, deduction of Boyle's law, interpretation of temperature, estimation of rms speeds of molecules. Brownian motion, estimation of the Avogadro number. Law of Equipartition of energy, specific heat of monatomic gas, extension to di- and tri- atomic gases, behavior at low temperatures. Adiabatic expansion of an ideal gas, applications to atmospheric physics. Real Gas: Van der Waals gas, Equation of state, nature of Van der Waals forces, comparison with experimental P-V curves. The critical constants; gas and vapour. Joule expansion of ideal gas and Vander Waals gas, Joule coefficient, estimates of J-T cooling. Liquefaction of gases: Boyle temperature and inversion temperature. Principle of regenerative cooling, liquefaction of hydrogen and helium. Refrigeration cycle, meaning of efficiency.

**Unit-2** Thermodynamics: The laws of thermodynamics: The Zeroth law, first law of thermodynamics, internal energy as a state function and other applications. Reversible and irreversible changes, Carnot cycle and its efficiency, Carnot theorem and the second law of thermodynamics, Entropy,. The thermodynamic scale of temperature; its identity with the perfect gas scale. Impossibility of attaining the absolute zero; third law of thermodynamics. Thermodynamic relationships: Thermodynamic variables: Maxwell's general relationships, application to Joule – Thomson cooling and adiabatic cooling in a general system, Clausius-Clapeyron Latent heat equation. Cooling due to adiabatic demagnetization, Production and measurement of very low temperatures.

**Unit-3** Statistical Physics: The statistical basis of thermodynamics: Probability and thermodynamic probability, principle of equal a priori probabilities, probability distribution and its narrowing with increase in number of particles. The expressions for average properties. Constrains, accessible and inaccessible states, distribution of particles with a given total energy into a discrete set of energy states. Some universal laws: The  $\mu$  space representation, division of  $\mu$  space into energy states and into phase cells of arbitrary size, applications to one-dimensional harmonic oscillator and free particles. Equilibrium between two systems in thermal contact, bridge with macroscopic physics. Probability and entropy, Boltzmann entropy relation. Statistical interpretation of second law of thermodynamics. Boltzmann canonical distribution law and its applications; Rigorous form of equipartition of energy.

**Unit-4** Maxwellian distribution of speeds in an ideal gas: Distribution of speeds and velocities, experimental verification, distinction between mean, rms and most probable speed values. Doppler broadening of spectral lines. Black Body Radiation :Pure temperature dependence, Stefan-Boltzmann law, pressure of radiation, Spectral distribution of Black Body radiation. Wien's displacement law, Rayleigh-Jean's law, the ultraviolet catastrophe, Planck's quantum postulates, Planck's law, complete fit with experiment. Interpretation of behaviour of specific heats of gases at low temperature .

**Unit-5** Quantum Statistics: Transition to quantum statistics; “h” as a natural constant and its implications, cases of particle in a one dimensional box and one-dimensional harmonic oscillator. Indistinguishability of particles and its consequences, Bose- Einstein and Fermi-Dirac conditions; applications to liquid helium, Free electrons in a metal, and photons in blackbody chamber. Fermi level and Fermi energy. Transport Phenomena : Transport phenomena in gases; Molecular collisions, mean free path and collision cross sections. Estimates of molecular diameter and mean free path. Transport of mass, momentum and energy and interrelationship, dependence on temperature and pressure.

### **TEXT AND REFERENCE BOOK**

1. “Thermal Physics” G.G. Agarwal and H.P. Sinha, Ram Prasad & Sons , Agra.
2. “Heat and Thermodynamics” Satya Prakash and Singhal, Pragati Prakashan Meerut.
3. “Unified Physics” R. P. Goyal ,Shivlal, Agrawal & Co. Agra.
4. ”Introduction to Statistical Mechanics” B. B. Laud (MacMillan, 1981).
5. “Statistical Physics” F. Reif (Tata McGraw-Hill, 1988).
6. “Statistical Physics” K. Huang (Wiley Eastern K. Huang, 1988).
7. "Praboth Bhoutiki" Kher, Choube , & Upadhyay, Yugboth Offset Pvt. , Ltd, Raipur.
8. Statistical Physics " S.K.Sinha , Narosa Pub. Kolkatta.



**Dr. C.V. RAMAN UNIVERSITY**  
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**SEMESTER- 3<sup>rd</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: DATA STRUCTURE**  
**COURSE CODE: 3BSCCS4, CREDIT:4**

**THEO. MAX. M: 70 MIN. M:23**  
**ASSIG. MAX. M: 30 MIN. M:10**  
**PRACTICAL MAX.M:50 MIN.M:17**

**Unit 1**

Data Structure and Algorithms- Introduction, Data Structures, Fundamentals of DS, Operations on Data Structure Arrays – Introduction, Memory/Storage Representation of One and Two Dimensional Array, Sorting- Definition of Sorting, Comparison of Sorting Method, Bubble Sort, Insertion Sort, Selection Sort, Merging. Searching- Definition, Type of Searching (Binary Search, Linear Search.)

**Unit 2**

Stacks- Introduction & Definition, Application of Stack, Various Representation of Stack, Operation on stack (Push and Pop) Hierarchy of Operation, Representation of Arithmetic Expression (Infix, Postfix, Prefix) Multiple Stack. Evaluation of postfix expressions and their conversions Queues- Introduction, Applications of Queue, Various Representations of Queue, Operation on queue. Concept of Deque, Priority Queues, Circular Queue.

**Unit 3**

Recursion- Introduction, Recursion Properties, Applications of Recursion (Factorial, Addition of Two Number, Power of A Number, Fibonacci Series, Multiplication of Two Number, Tower of Hanoi.) Advantages and Disadvantages of Recursion. Linked List- Introduction, Application of Linked List, and Representation of Linked List, Operation on Linked List (Inserting, Removing, Reversing, Searching, Sorting). Concept of Double Linked List.

**Unit 4**

Trees- Introduction, Definition of Trees, Binary Tree, Type of Binary Tree, Operation on Binary Tree, Traversal of Binary Tree, Binary Search Tree (BST), Expression Trees, Memory Representation of Binary Tree

**Unit 5**

Graphs: - Definition of Graph, Various Terminology Used in Graph, Sequential Representation of Graph, Path Matrix, Spanning Tree, and Minimum Spanning Tree (Kruskal Algorithm, PRIM'S Algorithm), Traversing a Graph.

**TEXT AND REFERENCE BOOK**

1. LipschutzSchaum's "Data Structure" Outline Series [TMH].
2. D. Samanta, "Classical Data Structure", Prentice Hall India.
3. Dr. S.B. Kishor, "Data Structures", Das Ganu ,4th Edition.
4. Tenenbaum," Data Structures Using C and C++", Second Edition, Prentice Hall India, New Delhi.
5. Deshpande and Kakade, "C and Data Structure", Dramatic Pub..ISBN-81-7722424-7



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**SEMESTER- 3<sup>rd</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**COURSE: MATHEMATICS-III**

**COURSE CODE:3BSCCS5, CREDIT:4**

**THEO. MAX. M: 70MIN. M:23**

**ASSIG. MAX. M: 30 MIN. M:10**

**Unit-1** Definition of a sequence. Theorems on limits of sequences. Bounded and monotonic sequences. Cauchy's convergence criterion . Series of non-negative terms. Comparison test, Cauchy's integral test, Ratio test. Raabe's test ,logarithmic test. Leibnitz's theorem. Absolute and conditional convergence.

**Unit-2** Continuity of functions of one variable , sequential continuity. Properties of continuous functions. Uniform continuity. Chain rule of differentiability. Mean value theorems and their geometrical interpretations. Darboux's intermediate value theorem for derivatives. Limit and continuity of functions of two variables.

**Unit-3** Series Solution of Differential Equations-Power series Method, Bessel's Equation Bessel's function and its properties, recurrence and generating relations. Legendre's

**Unit-4** Laplace transformations, Linearity of the Laplace transformation, Existence theorem of Laplace transforms, Laplace transforms of derivatives and integrals. Shifting theorem . Differentiation and integration of transforms. Inverse Laplace transforms, Convolution theorem. Applications of Laplace transformation in solving linear differential equations with constant coefficients.

**Unit-5** Analytical conditions of equilibrium of Coplanar forces. Catenary. Forces in three dimensions. Velocities and accelerations along Radial and transverse direction

**TEXT AND REFERENCE BOOK**

1. H.K.Pathak, Calculus & Differential equation & Mechanics.
2. B.R. Thakur, Differential equation.
3. Erwin Kreyzing, Advanced Engineering Mathematics, New York.
4. S.C.Malik, mathematical Analysis, Wiley esterm, Ltd New Delhi.
5. P.K.Jain & S.K.Kaushik, An introduction to Real Analysis, Chand & Co. New Delhi



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**SEMESTER- 3<sup>rd</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**PRACTICAL MAX.M:50 MIN.M:17**

**COURSE: PRACTICAL PHYSICS-III**

**List of Experiments:**

1. To determine the grid voltage plate current characteristics of a triode valve (6C5) and then to find the triode constants.
2. To measure the dynamic constants of triode valve.
3. To draw and study the static plate characteristics of a triode valve.
4. Study and verification of universal gates.
5. Study and verification of additional gates ie. EX-OR and EX-NOR..
6. To determine the value of mechanical equivalent J of heat by Searls's method.
7. To determine the value of mechanical equivalent J of heat by using Callender & Barnes apparatus.
8. Study of Brownian motion.
9. Study of Stefan's law.
10. Determination of thermal conductivity of dielectric materials.

**TEXT AND REFERENCE BOOK**

1. Practical Physics, Dr. S.L. Gupta & Dr. V. Kumar, Pragti Prakashan Meerut
2. Degree level practical Physics, Sharma, Singh & Prashad, Bharti Bhawan Publication Patna-6.
3. Experiment in Engineering Physics-M.N. Awadhanulu, A.A. Dani & P.M. Pokle, S.Chand Pub. New Delhi.
4. Prabodh Prayogik Bhoutiki, Dr. P.K.Upadhayay, Yugbodh offset Pvt. Ltd. Raipur
5. A text book of Engineering Physics Practical Das, Robinson & Kumar University Science press New Delhi
6. Practical Phywsics, Chattopadhyay



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**SEMESTER- 3<sup>rd</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**PRACTICAL MAX.M:50 MIN.M:17**

**COURSE: PRACTICAL DATA STRUCTURE**

**List of Experiments:**

1. To insert an element item at Kth position of Array.
2. To insert an element Item in Sorted Array.
3. To implement the operation of Push, Pop and to know the status of stack.
4. An algorithm to check the status of stack.
5. To find factorial of a number using Recursion.
6. To find multiplication of two number using Recursion.
7. To simulation the game of Tower of Hanoi using recursion.
8. To implement the operation of insertion and deletion on Queue.
9. A menu driven program to implement the operation of addition, deletion, searching, traversing, reversion, sorting,
10. Implementation of stack using linked list.
11. Implementation of Queue using linked list.
12. To create binary search tree, traverse it and find number of leaves and total nodes in the Tree.
13. To arrange the list of number in a Sorted order using Bubble sort.
14. To arrange the list of number in the Sorted order using Quick sort.
15. To check all the element of list is in sorted order or not.
16. To search an element using sequential or linear search .At the end display time required to search an element including number of comparison.
17. To search an item position in sorted list (Binary search).

**TEXT AND REFERENCE BOOK**

1. LipschutzSchaum's "Data Structure" Outline Series [TMH].ISBN-0-07-060168-2
2. D. Samanta, "Classical Data Structure", Prentice Hall India, ISBN: 8120318749



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Kargi Road, Kota, Bilaspur (C.G.)

**SEMESTER- 4<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**COURSE: ENGLISH LANGUAGE AND SCIENTIFIC TEMPER**

**COURSE CODE:4BSCCS1, CREDIT:2**

**THEO. MAX. M: 35 MIN. M:12**

**ASSIG. MAX. M: 15 MIN. M:5**

**UNIT – I**

1. Tina Morris : Tree
2. Nissim Ezekiel : Night of the Scorpion
3. C.P. Snow : Ramanujan
4. Roger Rosenblatt : The Power of WE
5. George Orwell: What is Science?
6. C.Rajagopalachari : Three Questions
7. Desmond Morris : A short extract from the Naked Ape
8. A.G. Gardiner : On the rule of the road

**UNIT – II** Comprehension of an unseen passage.

**UNIT – III** Letter Writing : Formal Letters, Informal letters, Applications.

**UNIT – IV** Report Writing.

**UNIT – V** Language Skills

Correction of common errors in sentence structure : usage of pronouns, subject/ verb agreement word order, gender; compound nouns, collective nouns, possessives, articles and prepositions. (advanced)

**TEXT AND REFERENCE BOOK**

1. English Language and Scientific Temper- Madhya Pradesh Hindi Granth Academy
2. Essentials of English Grammar by Sultan Chand & Sons
3. English Grammar and Composition by Wren & Martin
4. Scholar's Senior English Grammar and Composition, T.R. Bhanot, H. Martin, Scholar Publishing House (P) Ltd.



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**SEMESTER- 4<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**COURSE: ENVIRONMENTAL STUDY-II**

**COURSE CODE:4BSCCS2, CREDIT: 2**

**THEO. MAX. M: 35 MIN. M:12**

**ASSIG. MAX. M: 15 MIN. M: 5**

**UNIT – I Problem of natural resources**

- (a) Problem of water resources – Utilization of surface and ground water, over utilization, flood, drought, conflicts over water, dams-benefits and problem.
- (b) Problems of forest resources – uses and over utilization, deforestation, utilization of timber, dams and its effect on forests and tribes.
- (c) Problems of land resources – Land as a source, erosion of land, man-induced landslides and desertification.

**UNIT – II Bio-diversity and its protection –**

- (a) Value of bio-diversity – Consumable use : Productive use, Social, alternative, moral aesthetic and values.
- (b) India as a nation of bio-diversity and multi-diversity at global, national and local levels.
- (c) Threats to bio-diversity – Loss of habitat, poaching of wildlife, man-wildlife conflicts.

**UNIT – III Human Population and Environment**

- (a) Population growth, disparities between countries.
- (b) Population explosion, family welfare Programme.
- (c) Environment and human health.

**UNIT – IV Multidisciplinary nature of environmental studies :**

- (a) Natural resources
- (b) Social problems and the environment
- (c) Eco system.

**UNIT – V Environmental Wealth :**

- (a) Rivers, ponds, fields and hills.
- (b) Rural, Industrial, Agricultural fields.
- (c) Study of common plants, insects and birds.

**TEXT AND REFERENCE BOOK**

1. Environment & Ecology, P.K.Pandey, Goel Publication.
2. Environment & Ecology, Dr.J.P.Sharma, Laxmi Publication.



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**SEMESTER- 4<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**COURSE: PHYSICS-IV**

**COURSE CODE:4BSCCS3, CREDIT:4**

**THEO. MAX. M: 70MIN. M:23**

**ASSIG. MAX. M: 30 MIN. M:10**

**PRACTICAL MAX.M:50 MIN.M:17**

**Unit-1 Waves: Waves in Media** ; Speed of transverse waves on a uniform string, speed of longitudinal waves in a fluid, gravity waves and ripples. Group velocity and phase velocity, their measurements. **Superposition of waves** : Linear homogeneous equations and the superposition principle, Standing waves harmonics and the quality of sound , examples. Chladni's figures and vibrations of a drum. Production and detection of ultrasonic and infrasonic waves and applications.

**Unit-2 Acoustics:** Noise and Music , The human ear and its responses , limits of human audibility, intensity and loudness, bel and decibel, the musical scales, temperament and musical instrument. Reflection, refraction and diffraction of sound; Acoustic impedance of a medium, percentage reflection and refraction at a boundary, impedance matching for transducers, diffraction of sound, principle of a sonar system, sound ranging. **Applied acoustics** : Transducers and their characteristics. Recording and reproduction of sound, various systems, measurements of frequency, waveform, intensity and velocity. The acoustics of halls, reverberation period, Sabine's formula.

**Unit-3 Geometrical Optics:** Fermat's Principle of extremum path, the aplanatic points of a sphere and other applications. General theory of image formation: cardinal points of an optical system, general relationships for thick lens and lens combinations,. Optical instruments: Entrance and exit pupils, need for a multiple lens eyepiece, common types of eyepieces.

**Unit-4 Interference:** Interference of light; The principle of superposition, twoslit interference, coherence requirement for the sources, thin films, interference by a film with two non-parallel reflecting surfaces, Newton's rings. Haidinger fringes ( Fringes of equal inclination). Michelson interferometer, its application for precision determination of wavelength, Intensity distribution in multiple beam interference, Fabry-Perot interferometer and etalon.

**Unit-5 Fresnel Diffraction** : Fresnel half period zones, plates, straight edge, rectilinear propagation. Fraunhofer Diffraction: Diffraction at a slit, phasor diagram and integral calculus methods, the intensity distribution, diffraction at a circular aperture and a circular disc, Rayleigh criterion, resolving power of telescope and microscope. **Diffraction & Polarization** : Diffraction gratings: Diffraction at N parallel slits, plane diffraction grating, reflection grating and blazed gratings. Concave grating and different mountings. Resolving power of a grating. Double refraction and optical rotation: Refraction in uniaxial crystals. Phase retardation plates.

**TEXT AND REFERENCE BOOK**

1. "Physical Optics". A.K. Ghatak, TMH, New Delhi.
2. "Optics and Atomic Physics" ( D.P. Khandelwal Himalaya Publishing House, Bombay, 1988).
3. "Fundamental of Optics" Jankins and white(Tata McGraw – Hill)
4. Praboth Bhoutiki ,"Kher , Choube & Upadhyay", Yugbodh Publication, Raipur.
5. "Optics". B.K. Mathur.
6. "Vibration and Waves" K K. Srivastava, Anusandhan Publication, Kanpur.
7. "Oscillations and Waves" Satya Prakash, Pragati Publication Agra.
8. "Sound". Khanna and Bedi
9. "Unified Physics" R. P. Goyal, Shivlal, Agrawal & Co. Agra.
10. "A Text Book of Sound" N. Subrahmanyam & Brij Lal ,Vikash Pub.New Delhi.
11. Acoustics , Durga Prasad,Student Friends Pub. Patna.
12. Optics , P.K.Shrivastava , Epsilon Publishing House Kanpur.



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Kargi Road, Kota, Bilaspur (C.G.)

**SEMESTER- 4<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: INTRODUCTION TO DATABASE**  
**COURSE CODE:4BSCCS4, CREDIT:4**

**THEO. MAX. M: 70MIN. M:23**  
**ASSIG. MAX. M: 30 MIN. M:10**  
**PRACTICAL MAX.M:50 MIN.M:17**

**Unit 1**

Basic Concepts – Data, Information, Records and files. Traditional file –based Systems-File Based Approach-Limitations of File Based Approach, Database Approach-Characteristics of Database Approach, Database Management System (DBMS), Components of DBMS, Environment, DBMS Functions and Components, Advantages and Disadvantages of DBMS. Roles in the Database Environment - Data and Database Administrator, Database, Designers, Applications Developers and Users.

**Unit 2**

Database System Architecture – Three Levels of Architecture, External, Conceptual and Internal Levels, Schemas, Mappings and Instances. Data Independence – Logical and Physical Data Independence.

**Unit 3**

Classification of Database Management System, Centralized and Client Server architecture to DBMS. Data Models: Records- based Data Models, Object-based Data Models, Physical Data Models and Conceptual Modeling.

**Unit 4**

Entity-Relationship Model – Entity Types, Entity Sets, Attributes Relationship Types, Relationship Instances and ER Diagrams. Basic Concepts of Hierarchical and Network Data Model.

**Unit 5**

Relational Data Model:-Brief History, Relational Model Terminology-Relational Data, Structure, Database Relations, Properties of Relations, Keys, Domains, Integrity Constraints over Relations, Base Tables and Views.

**TEXT AND REFERENCE BOOK**

1. Elmasri & Navathe, “Fundamentals of Database Systems”, 5th edition, Pearson Education.
2. Thomas Connolly Carolyn Begg, “Database Systems”, 3/e, Pearson Education
3. C. J. Date, “An Introduction to Database Systems”, 8th edition, Addison Wesley N. Delh



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**SEMESTER- 4<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: MATHEMATICS-IV**  
**COURSE CODE:4BSCCS5, CREDIT:4**

**THEO. MAX. M: 70MIN.23**  
**ASSIG. MAX. M: 30 MIN. M:10**

**Unit -1** Partial differentiation. Change of variables. Euler's Theorem on homogeneous function, Taylor's theorem for functions of two variables. Jacobians, Envelopes, Evolutes.

**Unit -2** Maxima, minima and saddle points of functions of two variables. Beta and Gamma functions. Double and triple integrals. Dirichlet's integrals.

**Unit -3** Partial Differential equations of the first order. Lagrange's solution. Some special types of equations which can be solved easily by methods other than general methods. Charpit's general method of solution, Partial differential equations of second and higher orders. Homogeneous and non- Homogeneous equations with constant coefficients. Partial differential equations reducible to equations with constant coefficients.

**Unit -4** Complex numbers as ordered pairs. Geometric representation of Complex numbers, Continuity and differentiability of Complex functions. Analytical function, Cauchy Riemann equation, Harmonic function, Mobius transformations, fixed point, cross ratio.

**Unit -5** Group-Automorphisms, inner automorphism. Group of Automorphism, Conjugacy relation and centraliser. Normaliser. Counting principle and the class equation of a finite group. Cauchy's theorem for finite abelian groups and non abelian groups. Ring homomorphism. Ideals and Quotient Rings.

**TEXT AND REFERENCE BOOK**

1. H.K.Pathak, Advanced Calculus, Partial Differential Equation, Complex analysis & Abstract Algebra.
2. B.R. Thakur, Advanced Calculus, Partial Differential Equation, Complex analysis & Abstract Algebra.
3. S.C. Malic, mathematical Analysis, Wiley Eastern Ltd New Delhi.
4. P.K.Jain & S.K.Kaushik, An introduction to Real Analysis.
5. P.B. Bhattacharya, Abstract Algebra.



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Kargi Road, Kota, Bilaspur (C.G.)

**SEMESTER- 4<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: PRACTICAL-PHYSICS**

**PRACTICAL MAX.M:50 MIN.M:17**

**List of Experiments:**

1. Determination of wavelength of sodium light by Newton' Ring method.
2. To determine the wave length of prominent spectra-lines of Hg light using plane transmission grating.
3. To determine the focal length of the combination of two thin convergent lenses separated by a distance, with the help of a nodal slid assembly and to verify the formula.
4. Determination of resolving power of telescope.
5. Determination of Refractive index and dispersive power of prism using spectrometer.
6. Measurement of sound intensities with different situation.
7. Characteristics of a microphone & loudspeaker system.
8. Study and analysis human ear (On the basis of Physical concept).
9. Study of Ultrasonic waves.
10. Study of polarization of light by using polarimeter.

**TEXT AND REFERENCE BOOK**

1. Practical Physics, Dr. S.L. Gupta & Dr. V. Kumar, Pragati Prakashan Meerut
2. Degree level practical Physics, Sharma, Singh & Prashad, Bharti Bhawan Publication Patna-6.
3. Experiment in Engineering Physics-M.N. Awadhanulu, A.A. Dani & P.M. Pogle, S.Chand Pub. New Delhi.
4. Prabodh Prayogik Bhoutiki, Dr. P.K.Upadhayay, Yugbodh offset Pvt. Ltd. Raipur
5. A text book of Engineering Physics Practical Das, Robinson & Kumar University Science press New Delhi
6. Practical Phywsics, Chattopadhyay



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**SEMESTER- 4<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**PRACTICAL MAX.M:50 MIN.M:17**

**COURSE: INTRODUCTION TO DATABASE LAB**

**LIST OF PRACTICALS:**

- 1 Data Definition Language Commands
- 2 Data Manipulation Language Commands
- 3 Data Control Language, Transfer Control Language Commands
- 4 In Built Functions
- 5 Nested Queries And Join Queries
- 6 Set operators
- 7 Views
- 8 Control Structure
- 9 Procedure and Function
- 10 Trigger
- 11 Front End Tools
- 12 Form
- 13 Menu Design
- 14 Report Generation
- 15 Database Design And Implementation

**TEXT AND REFERENCE BOOK**

1. Thomas Connolly Carolyn Begg, "Database Systems", 3/e, Pearson Education
2. C. J. Date, "An Introduction to Database Systems", 8th edition, Addison Wesley N. Delhi.
3. Elmasri & Navathe, "Fundamentals of Database Systems", 5th edition, Pearson Education.



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**SEMESTER- 5<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: BHASHA KAUSHAL AVAM SANCHAR SADHAN**  
**COURSE CODE:5BSCCS1, CREDIT:2**

**THEO. MAX. M: 35MIN.12**  
**ASSIG. MAX. M: 15 MIN. M:5**

**इकाई - 1**

1. भारतीय संस्कृति
2. भारतीय समाज व्यवस्था
3. सभ्यता एव संस्कार
4. वैश्विक चेतना
5. समन्वयीकरण (भारतीय एव अंतर्राष्ट्रीय सदंर्भ में)

**इकाई - 2**

1. धर्म
2. न्याय
3. दर्शन
4. नीति
5. साहित्य

**इकाई - 3**

1. संचार संसाधन : सम्पर्क के नए क्षितिज
2. समाचार पत्र
3. भारतीय प्रेस परिषद्
4. रेडियो
5. दूरदर्शन

**इकाई - 4**

1. सिनेमा
2. रंगमंच
3. सर्गीत
4. चित्र, मूर्ति, स्थापत्य कला
5. शिल्प कला

**इकाई - 5**

1. कम्प्यूटर
2. दूरभाष: विज्ञान की सौगात
3. मंत्रं (कहानी): प्रमे चदं
4. मातृभूमि (कविता): मैथिलीशरण गुप्त
6. साहित्यकार का दायित्व: डॉ. प्रेम भारती

**TEXT AND REFERENCE BOOK**

संदर्भ पुस्तक – मध्यप्रदेश हिन्दी ग्रंथ अकादमी भोपाल द्वारा प्रकाशित पुस्तक



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**SEMESTER- 5<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**THEO. MAX. M: 35MIN.12**

**COURSE: INTRODUCTION TO COMPUTER SYSTEMS  
AND CYBER LAW-I**

**ASSIG. MAX. M: 15 MIN. M:5**

**COURSE CODE:5BSCCS2,CREDIT:2**

**Unit I Computer Architecture**

CPU Organization, Data Representation, Fixed - Point Numbers, Floating Point Numbers, Instruction Formats, Instruction Types. Addressing modes.Fixed Point Arithmetic, Addition, Subtraction, Multiplication and Division, Combinational and Sequential ALUs, Carry look ahead adder, Robertson algorithm, booth's algorithm, non-restoring division algorithm, Floating Point Arithmetic, Coprocessor, Pipeline Processing, Pipeline Design, Modified booth's Algorithm

Network architecture – layers – Physical links – Channel access on links – Hybrid multiple access techniques - Issues in the data link layer - Framing – Error correction and detection – Link-level Flow Control, UDP – TCP

**Unit II Medium Access**

Medium access – CSMA – Ethernet – Token ring – FDDI - Wireless LAN – Bridges and Switches

**Unit III Protocols**

Email (SMTP, MIME, IMAP, POP3) – HTTP – DNS- SNMP – Telnet – FTP – Security – PGP – SSH

**Unit IV Cyber Law**

Need for Cyber Law• Cyber Jurisprudence at International and Indian Level• Cyber Law - International Perspectives UN• & International Telecommunication Union (ITU) Initiatives Council of Europe - Budapest Convention on Cybercrime• Asia-Pacific Economic Cooperation (APEC)• Organization for Economic Co-operation and Development (OECD)• World Bank• Commonwealth of Nations•

## **Unit V: Cyber Crimes & Legal Framework**

Constitutional & Human Rights Issues in Cyberspace Freedom of Speech and Expression in Cyberspace• Right to Access Cyberspace – Access to Internet• Right to Privacy• Right to Data Protection•

### **TEXT AND REFERENCE BOOK**

1. John P.Hayes, 'Computer architecture and Organisation', Tata McGraw-Hill, Third edition, 1998.
2. V.Carl Hamacher, Zvonko G. Varanescic and Safat G. Zaky, "Computer Organisation", V edition, McGraw-Hill Inc, 1996.
3. James F. Kuross, Keith W. Ross, “Computer Networking, A Top-Down Approach Featuring the Internet”, Third Edition, Addison Wesley, 2004.
- 4.Chris Reed• & John Angel, Computer Law, OUP, New York, (2007).
5. Justice Yatindra Singh, Cyber Laws, Universal Law Publishing Co, New Delhi, (2012).
6. Verma S, K, Mittal Raman, Legal Dimensions of Cyber Space, Indian Law Institute, New



**Dr. C.V. RAMAN UNIVERSITY**

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Kargi Road, Kota, Bilaspur (C.G.)

**SEMESTER- 5<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**COURSE: PHYSICS-V**

**COURSE CODE:5BSCCS3, CREDIT:4**

**THEO. MAX. M:70MIN.23**

**ASSIG. MAX. M: 30 MIN.10**

**PRACTICAL MAX.M:50 MIN.M:17**

**Unit-1 Theory of Relativity:** Reference systems, inertial frames, Galilian Invariance and conservation laws, Michelson-Morley experiment; Postulates for the special theory of relativity, Lorentz transformations, length contraction, time dilation, variation of mass with velocity, mass - energy equivalence, particle with zero rest mass. **Origin of Quantum Theory:** photoelectric effect , Ritz combination principle in spectra. stability of an atom, Planck's radiation law, Einstein's explanation of photoelectric effect..

**Unit-2 Quantum Mechanics:** Wave-particle duality and uncertainty principle; de Broglie's hypothesis for matter waves; the concept of wave and group velocities, evidence for diffraction and interference of particles, experimental demonstrations of matter waves. Consequence of de Broglie's concepts; quantization in hydrogen atom; energies of a particle in a box, wave packets, Heisenberg's uncertainty relation for p and x, its extension to energy and time. Consequence of the uncertainty relation; gamma ray microscope, diffraction at a slit, particle in a box, position of an electron in a Bohr's orbit, Schrödinger's equation. Postulates of quantum mechanics; operators, expectation values.

**Unit-3 Atomic Physics:** natural occurrence of quantum numbers-n, l and m, the related physical quantities. Spectra of hydrogen, deuteron and alkali atoms spectral terms, doublet fine structure. screening constants for alkali spectra for s,p,d and f states, selection rules, Singlet and triplet fine structure in alkaline earth spectra. L-S and J-J couplings. **Weak Spectra:** Continuous X-ray spectrum and its dependence on voltage, Duane and Hundt's law. Characteristic X-rays. Moseley's law; doublet structure of X-ray spectra. X-ray absorption spectra.

**Unit-4 Molecular Spectra :** quantization of vibrational and rotational energies, pure rotational and rotation-vibration spectra Dissociation limit for the ground and other electronic states, transition rules for pure vibration and electronic vibration spectra. **Spectroscopy :** Raman Effect, Stokes and anti-stokes lines, experimental arrangements for Raman Spectroscopy. Spectroscopic techniques: Sources of excitation, prism and grating spectrographs for visible, UV and IR, absorption spectroscopy, double beam instruments, different recording systems.

**Unit-5 Nuclear Physics:** working of nuclear detectors, G-M counter, proportional counter, scintillation counter, cloud chamber, spark chamber and emulsions technique. Structure

of nuclei, basic properties ( $I$ ,  $\mu$ ,  $Q$  and binding energy), energy, p-p and n-p scattering and general concepts of nuclear forces. Beta decay, range of alpha particle, Geiger-Nuttal law. Gamow's explanation of alpha decay, beta decay, Nuclear reactions, compound nucleus,).Shell model, Liquid drop model, Nuclear fission and fusion (concepts), energy production in stars by p-p and carbon - nitrogen cycles (concepts).

### **TEXT AND REFERENCE BOOK**

1. Introduction to Modern Physics H. S. Mani and G. K. Mehta;“ (Affiliated East-West Press. 1989)”.
2. “Prospective of modern physics”. A. Belser.
3. ; “Introduction to atomic physics” H. E. White. TMH, Delhi.
4. “Introduction to Molecular Physics”. Barrow;
5. ; “Optics and Atomic Physics” (D. P. Khandelwal Himalaya Publishing House, Bombay, 1988).
6. “ Unified Physics” R. P. Goyal Shiv lal Agrawal & Co. Agra
7. "Prabodh Bhoutiki (Physics)". Kher , Choube & Upadhyay Yugbodh offset raipur
8. “Nuclear Physics”. D. C. Tayal, Himalaya Publishing House New Delhi
9. “Atomic Physics. J. B. Rajan
10. "Quantum Physics" Satya Prakash Sharma Pragati Prakasan meerut
11. "Introduction to Relativity" Gupta & Kumar, Pragati Prakasan meerut
12. Modern Physics, F.K. Richtmyer, E.H. Kennard & Jain Cooper TMH New Delhi



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**SEMESTER- 5<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**COURSE: SOFTWARE ENGINEERING**

**COURSE CODE:5BSCCS4,CREDIT:4**

**THEO. MAX. M:70MIN.23**

**ASSIG. MAX. M: 30 MIN.10**

**PRACTICAL MAX.M:50 MIN.M:17**

**UNIT –1 SOFTWARE PROCESS**

Introduction – S/W Engineering Paradigm – life models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) – system - computer based system – verification – validation – life cycle process – development process – system engineering hierarchy.

**UNIT –2 SOFTWARE REQUIREMENTS**

Functional and non-functional–user–system–requirement engineering process- feasibility studies – requirements – elicitation– validation and management – software prototyping– prototyping in the software process – rapid prototyping techniques – user interface prototyping – S/W document.

**UNIT – 3 DESIGN CONCEPTS AND PRINCIPLES**

Design process and concepts – modular design – design heuristic – design model and document. Architectural design software architecture data design architectural design transform and transaction marring – user interface design – user interface design principles acquisitions system – monitoring and control system.

**UNIT – 4 TESTING &MAINTENANCE**

Taxonomy of software testing – levels – test activities – types of s/w test – black box testing - testing boundary condition – structural testing –test coverage criteria Based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies –strategic approach and issue – unit testing – integration testing – validation testing – system testing and debugging.

**UNIT – 5 SOFTWARE PROJECT MANAGEMENT**

Measures and measurements – S/W complexity and science measure – size measure –data and logic structure measure information flow measure. Software cost estimation function oriented models – COCOMO model-Delphi method- Defining a Task Network – Scheduling Earned Value Analysis

**TEXT AND REFERENCE BOOK**

1. Software engineering – A practitioner’s Approach, Roger S. Pressman, McGraw-Hill, International Edition, 5<sup>th</sup> edition, 2001
2. Object Oriented Modelling & Design, Remgaugh J. Blaha, M. Premeralant, W. Eddy F. And Lornsen W. (PHI)
3. Software engineering, Ian Sommerville, Person education Aisa. 6<sup>th</sup> edition 2000.
4. An Integrated Approach to Software Engineering , Pankaj Jalote, Springer Verlag.
5. Software Engineering – An Engineering Approach, James F. Peters and Witold Pedrycz., Johan Wiley and Sons. New Delhi. 2000.



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**SEMESTER- 5<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**COURSE: MATHEMATICS-V**

**COURSE CODE:5BSCCS5,CREDIT:4**

**THEO. MAX. M:70MIN.23**

**ASSIG. MAX. M: 30 MIN.10**

**Unit -1** Riemann integral, Integrability of continuous and monotonic functions, The fundamental theorem of integral calculus, Mean value theorems of integral calculus, Partial derivatives and differentiability of real-valued functions of two variables.

**Unit -2** Schwarz and Young's theorem, Implicit function theorem, Fourier series of half and full intervals, Improper integrals and their convergence, Comparison test, Abel's and Dirichlet's tests, Frullani's integral, Integral as a function of a parameter.

**Unit -3** Definition and examples of vector spaces, subspaces, Sum and direct sum of subspaces. Linear span, Linear dependence, independence and their basic properties. Basis, Finite dimensional vector spaces, Existence theorem for basis, Invariance of the number of elements of a basis set, Dimension, Dimension of sums of vector subspaces.

**Unit -4** Linear transformations and their representation as matrices, The Algebra of linear transformations, The rank- nullity theorem, Eigen values and eigen vectors of a linear transformation, Diagonalisation. Quotient space and its dimension.

**Unit -5** Binary Relations, Equivalence Relations, Partitions and Partial Order Relation . Graphs, Multigraphs, Weighted Graphs, Paths and Circuits, Shortest Paths. Trees and their properties.

**TEXT AND REFERENCE BOOK**

1. H.K.Pathak, Real Analysis, Linear Algebra, Discrete Mathematics.
2. B.R.Thakur, Real Analysis, Linear Algebra, Discrete Mathematics.
3. M.K.Gupta, Discrete Mathematics.
4. P.K.Jain & S.K.Kaushik, An Introduction to Real Analysis.
5. K.B.Dutta, Matrix & Linear algebra.



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**SEMESTER- 5<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**PRACTICAL MAX.M:50 MIN.M:17**

**COURSE: PRACTICAL PHYSICS V**

1. Determination of Planck's constant.
2. Determination of  $e/m$  using Thomson's method.
3. Determination of  $e/m$  by Millikan's method.
4. Study of Raman spectrum using laser as an excitation source.
5. Determination of percentage of absorption of light by photometer
6. To draw the plateau characteristics of a GM counter using radioactive source.
7. Study of twin paradox.
8. Study of  $\beta$ - decay.
9. Study of Balmer-series and Rydberg constant.
10. Study of Photo Cell.
11. To understand two beam interferometry by using Michelson interferometer.

**TEXT AND REFERENCE BOOK**

1. Practical Physics, Dr. S.L. Gupta & Dr. V. Kumar, Pragti Prakashan Meerut
2. Degree level practical Physics, Sharma, Singh & Prashad, Bharti Bhawan Publication Patna-6.
3. Experiment in Engineering Physics-M.N. Awadhanulu, A.A. Dani & P.M. Pogle, S.Chand Pub. New Delhi.
4. Prabodh Prayogik Bhoutiki, Dr. P.K.Upadhayay, Yugbodh offset Pvt. Ltd. Raipur
5. A text book of Engineering Physics Practical Das, Robinson & Kumar University Science press New Delhi
6. Practical Phywsics, Chattopadhyay



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**SEMESTER- 5<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**PRACTICAL MAX.M:50 MIN.M:17**

**COURSE: PRACTICAL SOFTWARE ENGINEERING**

Every **three to four students** should form a group and should develop a software that could be developed within **two month** of time.

The groups should prepare a **softcopy as well as hardcopy** of the documentation as per phases given below.

Every student in the group should have a copy of the documentation

Every student should get his own copy of the documentation properly checked from the **Teacher In- charge**, after every phase of development given below.

Before the Final Practical examinations, every individual student should submit his own hardcopy of the documentation in a **Punched Cardboard File Only**.

One **CD** of the project and its documentation (softcopy), from every group should be submitted during

**final submissions.**

During **Final Submissions**, every copy of the documentation should be accompanied by a **Submission Certificate** duly signed by the **Teacher In-charge and Head of Department**.

**Planning Phase**

**1. Problem Statement :-**

- a. Description of the present situation.
- b. Problem constraints (Manpower, Software and Hardware).
- c. Statement and brief description of Goals (Process and Product).
- d. Statement and brief description of Requirements (Functions, Hardware, Software and User interface) of the overall product.

**2. Solution strategy :-**

- a. List and brief description of all possible

solutions.

b. List and brief description of all accepted solutions

c. List and brief description of all rejected solutions.

**3. Development process :-**

a. Life cycle model for the project.

b. Team structure for the project (Details of team members also needed).

c. Software Configuration Management :-

i. List and brief description of non-changeable objects that would contribute to the software phase wise.

ii. List and brief description of changeable objects that would contribute to the software phase wise.

d. Software Quality assurance :-

i. List and brief description of quality attributed decided for evaluating the software product phase wise.

ii. List and brief description of the validations (are we making the product right ?) and verifications (are we making the right product? ) phase wise.

e. Risk management :-

i. List and brief description of any kind of Risks that may occur phase wise.

ii. List and brief description of any possible solutions for the above mentioned risks.

**4. Software metrics :-**

a. Deciding the complexity category of the product under development.

b. Estimating Lines of Code needed for the complete development of the product.

c. Calculating Programmer months for the project.

d. Calculating the development time for the project.

e. Calculating the Average staffing level for the project.

f. Using COCOMO model for performing cost estimation for the product.

**5. Review of the Planning Phase :-**

a. Points and brief description of the reviews conducted and report of the results obtained.

**Analysis and  
Design Phase**

**1. Analysis document for the product :-**

**a.** Data Dictionary :- List and brief description of all the components to be used in ERD, DFD and

ST

D.

**b.** Data Object Description document :- Entity Relationship Diagram (ERD)

**c.** Process Specification document :- Data Flow Diagram (DFD)

**d.** Control Specification document:- State Transition Diagrams (STD)

**2. Creating Designs document :-**

**a.** Data Design :- Description of the data objects and suggested algorithm.

**b.** Architectural Design :- Description of how to encapsulate the data with data structures and modules.

**c.** Interface Design :- Description of Interfaces to be created between various modules and between user and program.

**d.** Procedural Design :- Using flow charts and decision tables the entire system is explained.

**3. Preliminary design review :-**

**a.** Statements of Reviews done on the initial designs and comments for improvement, if necessary.

**4. Test Plan document :-**

**a.** List and brief description of Functional Tests (Black-Box testing) to be conducted and results expected.

**b.** List and brief description of Structural Tests (White-Box or Glass-Box testing) to be conducted and results expected.

**c.** List and brief description of Performance Tests to be conducted and results expected.

**d.** List and brief description of Stress Tests to be conducted and results expected.

## 5. Critical

### Design review :-

a. Statements of reviews done on the final designs, listing out important points, if necessary, to be remembered during the implementation phase.

### 6. Milestones, Walkthroughs and Inspection document :-

a. Setting up Milestones for the implementation and testing phases. b. Setting up Walkthrough schedules for the implementation phase. c. Setting up Inspection schedules for the implementation phase.

### Implementation Phase

1. **Coding :-** Here the actual coding is done according to the designs created and standards decided.
2. **Coding standards :-** Standards need to be followed related to the variable declarations and use.
3. **Internal documentation:-** Here small descriptions in the form of comments in the program code is used, describing the meaning of the code, modules or operations performed.
4. **Error documentation :-** List and brief description of errors displayed with their meanings and causes.
5. **Unit testing :-** Testing of individual modules and required code areas are done by using coding that would display temporary results. Those results are evaluated for correctness of code. A table is created stating the test criteria and results.
6. **Validation and Verification :-** A table is created stating the validation and verification activities performed on the code and results found.
7. **Review document :-** According to the milestones set, the reviews, walkthroughs and inspections are done and a document describing the above process and results found, is created.

### Testing Phase

1. **Testing table :-** The tests decided in Test plan document are conducted and a table is created showing the details of the test performed, expected results and actual found results.
2. **Test report :-** A summary of the Test report is created and suggestions for the steps to be

taken further are listed with brief description.

**User**

**Man**

**ual**

1. A document is created describing from the user point of view, how to use and trouble shoot the software product.
2. Different documents should be created for different category of users of the product.
3. A document describing the installation procedures.
4. Frequently Asked Questions and answers document is created from the user point of view.
5. Do's and Don'ts for the user.
6. List and brief description of Errors displayed and their meanings.
7. Contact details for further assistance.



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**SEMESTER- 6<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**THEO. MAX. M:23MIN.12**

**COURSE: ENGLISH LANGUAGE AND ASPECTS OF DEVELOPMENT**

**COURSE CODE:5BSCCS1,CREDIT:2**

**ASSIG. MAX. M: 15 MIN.5**

**Unit 1**

1. William Wordsworth : “The World is Too Much With Us”
2. K. Aludiapillai : “Communication Education and Information Technology”
3. “Democratic Decentralisation”
4. S. C. Dubey : “Basic Quality of Life”
5. Sister Nivedita : “The Judgment Seat of Vikramaditya”
6. Juliun Huxley : “War as a Biological Phenomenon”
7. Robert Frost : “Stopping by Woods on a Snowy Evening”
8. Ruskin Bond : “The Cherry Tree”

**Unit II** Short Essay of about 250-300 words

**Unit III** Translation of a short passage from Hindi to English

**Unit IV** Drafting CV, writing e-mail message for official purpose

**Unit V** Language Skills : One-word substitution, homonyms, homophones, words that confuse, Punctuation, Idioms

**TEXT AND REFERENCE BOOK**

1. Essentials of English Grammar by Sultan Chand & Sons
2. English Grammar and Composition by Wren & Martin
3. A Practical Guide to English Translation and Composition by K.P. Thakur ( Bharati Bhawan Publishers)
4. Scholar’s Senior English Grammar and Composition, T.R. Bhanot, H. Martin, Scholar Publishing House (P) Ltd.
5. English Language and Aspects of Development, published by M. P. Hindi Granth Academy



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**SEMESTER- 6<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**THEO. MAX. M:23MIN.12**

**COURSE: INTRODUCTION TO COMPUTER SYSTEMS AND CYBER LAW-II**

**COURSE CODE:6BSCCS2,CREDIT:2**

**ASSIG. MAX. M: 15 MIN.5**

**Unit 1 HTML**

Introduction to HTML, What is HTML, HTML Documents, Basic structure of an HTML document, Creating an HTML document, Mark up Tags, Heading-Paragraphs, Line Breaks, HTML Tags.Elements of HTML, Introduction to elements of HTML, Working with Text, Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls.

**Unit 2 Creating Website by HTML**

Introduction to Web Publishing or Hosting, Creating the Web Site, Saving the site, Working on the web site, Creating web site structure, Creating Titles for web pages, Themes-Publishing web sites.

**Unit 3 Operating System Introduction**

what is an operating system, History of OS, OS concepts, Types of OS, OS Structure, System calls and Types, Processes- Introduction to process, Inter-process Communication, Process Scheduling

**Unit 4 Memory Management and Deadlock**

Introduction, Swapping, Contiguous Memory Allocation, Paging, Segmentation, Virtual Memory Management- Demand Paging, Page Replacement , Deadlock Prevention, Avoidance, Detection, Recovery, Algorithms

**Unit 5 Cyber Act and Chrim**

Cyber Crimes against Individuals, Institution and State, Hacking, Digital Forgery, Cyber Stalking/Harassment, Cyber Pornography, Identity Theft, & Fraud Cyber terrorism, Cyber Defamation, Different offences under IT Act, 2000, Cyber Torts Cyber Defamation, Different Types of Civil Wrongs under the IT Act, 2000

**TEXT AND REFERENCE BOOK**

1. Operating Systems with case Studies by Achyut S Godbole,TMG.
2. Operating System Principles , Arbraham Silberschatz & Peter Baer Galvin
3. Kogent Learning Solutions Inc. HTML 5 in simple steps Dreamtech Press
4. A beginner's guide to HTML NCSA,14th May,2003
5. Delhi, (2004) Jonthan Rosenoer, Cyber Law, Springer, New York, (1997). 6.
- Sudhir Naib, The Information Technology Act, 2005: A Handbook, OUP, New York,



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**SEMESTER- 6<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**COURSE: PHYSICS-VI**

**COURSE CODE:6BSCCS3,CREDIT:4**

**THEO. MAX. M:70MIN.23**

**ASSIG. MAX. M: 30 MIN.10**

**PRACTICAL MAX.M:50 MIN.M:17**

**Unit-1 Overview:** Crystalline and glassy forms, liquid crystals, glass transition. Crystal structure: Periodicity, lattices and bases, unit cell, Wigner-Seitz cell, lattice types, lattice planes. Common crystal structures. Laue's theory of X-ray diffraction, Bragg's law, Laue patterns. Bonding: Potential between a pair of atoms; Lennard-Jones potential, concept of cohesive energy, covalent, Vander Waal, ionic and metallic crystals Magnetism: Atomic magnetic moment, magnetic susceptibility, Dia, Para and Ferromagnetism, Ferro magnetic domains

**Unit-2 Thermal properties:** Lattice vibrations, simple harmonic oscillator, Concept of phonons, density of modes (1-D). Debye model; Lattice specific heat low temperature limit, extension (conceptual) to 3-D. Band Structure: Electrons in periodic potential; nearly free electron model (qualitative), energy band, energy gap, metals, insulators, semiconductors. Motion of electrons: Free electrons, conduction electrons, electron collisions, mean free path, conductivity and Ohm's law. Fermi energy, Fermi velocity, Fermi-Dirac distribution.

**Unit-3 Semiconductors:** Semiconductors electrons and holes, Fermi Level , Temperature dependence of electron and hole concentrations. Doping: conductivity, mobility, Hall Effect, Hall Coefficient. Semiconductor devices: Metal-semiconductor junction, p-n junction, majority and minority carriers, diode, Zener and tunnel diodes, light emitting diode, transistor, solarcell. Power supply: Diode as a circuit element, load line concept, rectification, ripple factor, Zener diode, voltage stabilization, Transistors : Characteristics of a transistor in CB, CE and CC mode, thermal runaway. FETs: Field effect transistors, JFET volt-ampere curves, biasing JFETMOSFET, biasing MOSFET.

**Unit-4 Amplifiers- I:** Small signal amplifiers ; General Principle of operation, classification, distortion, RC coupled amplifier, input and output impedance, multistage amplifiers. Amplifier-II: Transformer coupled amplifiers, Noise in electronic circuits. OscillatorsHartley, Colpitt and Wein bridge oscillators.

**Unit-5 Laser:** Laser system: Purity of a spectral line, coherence length and coherence time, spatial coherence of a source, Einstein's A and B coefficients. Spontaneous and induced emissions, conditions for laser action, population inversion. Types of Lasers ( gas and solid state), Pulsed lasers and tunable lasers, spatial coherence and directionality, estimates of beam intensity, temporal coherence and spectral energy density.

**TEXT AND REFERENCE BOOK**

1. “Solid State Electronic Devices”, B.G.Streetmann; II<sup>nd</sup> Edition (Prentice-Hall of India, New Delhi, 1986).
2. “Electronic Devices, Circuits and Applications W.D. Stanley;” (Prentice-Hall, New Jersey, USA, 1988).
3. “Electronics Fundamentals and Applications”, J.D. Ryder; II<sup>nd</sup> Edition (Prentice-Hall of India, New Delhi, 1986).
4. “Microelectronics”, Int J. Millman and A Grabal; International Edition (McGraw-Hill Book Company, New York, 1988).
5. “Unified Physics”. R.P. Goyal, Shiv Lal Agrawal & Co. Agra
6. "Prabodh Bhoutiki " Kher , Choube & Upadhyay Yogbodh offset Pvt. Ltd. Raipur
7. “Hand Book of Electronics”. Gupta and Kumar, Pragati Prakashan Meerut
8. “Principle of Electronics”. V. K. Mehta, S. Chand New Delhi
9. "Laser & Non Linear Optics" B.B.Loud



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**SEMESTER- 6<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**COURSE: JAVA**

**COURSE CODE:6BSCCS4,CREDIT:4**

**THEO. MAX. M:70MIN.23**

**ASSIG. MAX. M: 30 MIN.10**

**PRACTICAL MAX.M:50 MIN.M:17**

**UNIT I**

Object oriented programming concepts – objects – classes – methods and messages – abstraction and encapsulation – inheritance – abstract classes – polymorphism.- Objects and classes in Java – defining classes – methods - access specifiers – static members – constructors – finalize method

**UNIT II**

Arrays – Strings - Packages – Java-Doc comments -- Inheritance – class hierarchy – polymorphism – dynamic binding – final keyword – abstract classes

**UNIT III**

The Object class – Reflection – interfaces – object cloning – inner classes – proxies - I/O Streams - Graphics programming – Frame – Components – working with 2D shapes.

**UNIT IV**

Basics of event handling – event handlers – adapter classes – actions – mouse events – AWT event hierarchy – introduction to Swing – Model-View-Controller design pattern – buttons – layout management – Swing Components – exception handling – exception hierarchy – throwing and catching exceptions.

**UNIT V**

Motivation for generic programming – generic classes – generic methods – generic code and virtual machine – inheritance and generics – reflection and generics - Multi-threaded programming – interrupting threads – thread states – thread properties – thread synchronization – Executors – synchronizers.

**TEXT AND REFERENCE BOOK**

1. K. Arnold and J. Gosling, “The JAVA programming language”, Third edition, Pearson Education, 2000.

**CVRU-IODE Programme Guide (2018-19) - FACULTY OF SCIENCE**

2. Timothy Budd, “Understanding Object-oriented programming with Java”, Updated Edition, Pearson Education, 2000.
3. C. Thomas Wu, “An introduction to Object-oriented programming with Java”, Fourth Edition, Tata McGraw-Hill Publishing company.
4. Cay S. Horstmann and Gary Cornell, “Core Java: Volume I – Fundamentals”, Eighth Edition, Sun Microsystems Press, 2008.



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**SEMESTER- 6<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**

**COURSE: MATHEMATICS-VI**

**COURSE CODE:6BSCCS5, CREDIT:4**

**THEO. MAX. M:70MIN.23**

**ASSIG. MAX. M: 30 MIN.10**

**Unit -1** Definition and examples of metric spaces. Neighbourhoods. Limit points. Interior points. Open and closed sets. Closure and interior. Boundary points. Subspace of a metric space. Cauchy sequences. Completeness, Cantor's intersection theorem, Contraction principle. Real numbers as a complete ordered field. Dense subsets. Baire Category theorem. Separable, first and second countable spaces.

**Unit -2** Continuous functions. Extension theorem. Uniform continuity. Compactness, Sequential compactness. Totally bounded spaces, Finite intersection property. Continuous functions and compact sets. Connectedness

**Unit -3** Solution of Equations: Bisection. Secant, Regula Falsi. Newton, Method. Roots of second degree Polynomials, Interpolation, Lagrange interpolation, Divided Differences, Interpolation formulae using Differences, Numerical Quadrature, Newton-Cote's Formulae, Gauss Quadrature Formulae.

**Unit -4** Linear Equations: Direct Methods for Solving Systems of Linear Equations (Guass elimination, LU Decomposition. Cholesky Decomposition), Iterative methods (Jacobi. Gauss - Seidel Reduction Methods). Ordinary Differential Equations: Euler Method, Singlestep Methods, Runge-Kutta's Method, Multi-step Methods, Milne-Simpson Method. Methods Based on Numerical Integration, Methods Based on numerical Differentiation.

**Unit -5** ELEMENTARY STATISTICS Measures of dispersion-range, inter quartile range, Mean deviation, Standard deviation, moments, skewness and kurtosis. Probability, Continuous probability, probability density function and its applications (for finding the mean, mode, median and standard deviation of various continuous probability distributions) Mathematical expectation, expectation of sum and product of random variables. Theoretical distribution- binomial, Poisson distributions and their properties and use, Moment generating functions.

OR

**Unit -5** PRINCIPLES OF COMPUTER SCIENCE Data Storage of bits Ram Memory. Mass storage. Coding Information of Storage. The Binary System Storing integers fractions, communication errors. Data Manipulation - The Central Processing Unit

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The Stored Program concept. Programme Execution,. Arithmetic/Logic Instruction. Computer-Peripheral Communication. Operation System : The Evolution of Operating System.(Dos, Window) Operating System Architecture. Coordinating the Machine's Activities. Other Architectures.

OR

**Unit -5** MATHEMATICAL MODELING The process of Applied Mathematics. Setting up first order differential equations. Qualitative solution sketching. Stability of solutions. Difference and differential equation models of growth and decay. Single species population model, Exponential and logistic population models.

**TEXT AND REFERENCE BOOK**

1. H.K.Pathak, Metric Spaces, Numerical Analysis.
2. B.R.Thakur, Metric Spaces, Numerical Analysis.
3. P.K.Jain & S.K.Kaushik, An introduction to Real Analysis.
4. P.K.Jain & K. Ahamad, Metric Spaces, Narosa Publishing, New Delhi.
5. B.S.Grewal, Numerical Method.



**Dr. C.V. RAMAN UNIVERSITY**  
**Institute of Open and Distance Education (IODE)**

Kargi Road, Kota, Bilaspur (C.G.)

**SEMESTER- 6<sup>TH</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: PRACTICAL PHYSICS -VI**

**PRACTICAL MAX.M:50 MIN.M:17**

1. Study the characteristic of a transistor.
2. Study the characteristic of a tunnel diode.
3. Study the characteristics of P-N Jn.
4. Determination of Hall coefficient using Hall probe method.
5. Study of Energy Band Gap of semiconductor.
6. Study of Zener Diode.
7. Study of Lissajous figures using a CRO.
8. Study of VTVM.
9. Study of crystal faces & Structure by using given model.
10. Study of Solar cell.

**TEXT AND REFERENCE BOOK**

1. Practical Physics, Dr. S.L. Gupta & Dr. V. Kumar, Pragti Prakashan Meerut
2. Degree level practical Physics, Sharma, Singh & Prashad, Bharti Bhawan Publication Patna-6.
3. Experiment in Engineering Physics-M.N. Awadhanulu, A.A. Dani & P.M. Pokle, S.Chand Pub. New Delhi.
4. Prabodh Prayogik Bhoutiki, Dr. P.K.Upadhayay, Yugbodh offset Pvt. Ltd. Raipur
5. A text book of Engineering Physics Practical Das, Robinson & Kumar University Science press New Delhi
6. Practical Phywsics, Chattopadhyay



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**SEMESTER- 6<sup>th</sup>**

**PROGRAMME: B.SC. COMPUTER SCIENCE**  
**COURSE: PRACTICAL JAVA PROGRAMMING**

**PRACTICAL MAX.M:50 MIN.M:17**

1. Write a program to check whether a number is a Armstrong number or not.
2. Write a program to sort a stream of Strings.
3. Write a program to perform multiplication of two matrices.
4. Write a program to find the volume of a box having its side w,h,d means width ,height and depth. Its volume is  $v=w*h*d$  and also find the surface area given by the formula  $s=2(wh+hd+dw)$ .use appropriate constructors for the above.
5. Develop a program to illustrate a copy constructor so that a string may be duplicated into another variable either by assignment or copying.
6. Create a base class called shape. It contains two methods getxyvalue() and showxyvalue() for accepting co-ordinates and to display the same. Create the subclass called Rectangle which contains a method to display the length and breadth of the rectangle called showxyvalue().Use overriding concept.
7. Write a program that creates an abstract class called dimension, creates two subclasses, rectangle and triangle. Include appropriate methods for both the subclass that calculate and display the area of the rectangle and triangle.
8. Write a program which throws Arithmetic Exception. Note the output, write another class  
(in a different file) that handles the Exception.
9. Create a user defined Exception class which throws Exception when the user inputs the marks greater than 100.
10. Write a program in which a Mythread class is created by extending the Thread class. In another class, create objects of the Mythread class and run them. In the run method print "CSVTVU" 10 times. Identify each thread by setting the name.

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11. Write a program using InetAddress class and also show the utility of URL and URL Connection classes.
12. Write a program which illustrates capturing of Mouse Events. Use Applet class for this.
13. Write a program using RMI in which a simple remote method is implemented.
14. Write a servlet program using HttpServlet class. Also give the appropriate HTML file which posts data to the servlet.
15. Write a JDBC program for Student Mark List Processing.
16. Design a text editor which is having some of the features of notepad.

**TEXT AND REFERENCE BOOK**

1. Java complete reference - Naughton schildt (TMH)
2. Java programming – E Balagurusamy
3. Java 2 Black book – Steven Holzner
4. Java Examples in a nutshell – O' Reilly

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**COUNSELING AND STUDY STRUCTURE**

Course Code	Name of the Course	Credit	Total Hours	Counseling and Study Structure (hours)			
				Face to Face Counseling	Self study	Practical	Assignments
<b>First Semester</b>							
1BSCCS1	Hindi Bhasha aur Sanrachna	2	60	8	34	-	18
1BSCCS2	Fundamentals of Entrepreneurship	2	60	8	34	-	18
1BSCCS3	Physics-I	4	120	16	44	24	36
1BSCCS4	Fundamental Of Computing	4	120	16	44	24	36
1BSCCS5	Mathematics-I	4	120	16	68	-	36
	<b>Total</b>	<b>16</b>					
<b>Second Semester</b>							
2BSCCS1	English Language and Indian Culture	2	60	8	34	-	18
2BSCCS2	Development of Entrepreneur	2	60	8	34	-	18
2BSCCS3	Physics-II	4	120	16	44	24	36
2BSCCS4	Programming With C	4	120	16	44	24	36
2BSCCS5	Mathematics -II	4	120	16	44		36
	<b>Total</b>	<b>16</b>					
<b>Third Semester</b>							
3BSCCS1	Hindi Bhasha Avam Samvedena	2	60	8	34	-	18
3BSCCS2	Environmental Study-I	2	60	8	34	-	18
3BSCCS3	Physics-II	4	120	16	44	24	36
3BSCCS4	Data Structure	4	120	16	44	24	36
3BSCCS5	Mathematics -III	4	120	16	68	-	36
	<b>Total</b>	<b>16</b>					
<b>Fourth Semester</b>							
4BSCCS1	English Language and Scientific Temper	2	60	8	34	-	18
4BSCCS2	Environmental Study-II	2	60	8	34	-	18
4BSCCS3	Physics-IV	4	120	16	44	24	36
4BSCCS4	DBMS	4	120	16	44	24	36
4BSCCS5	Mathematics -IV	4	120	16	68	-	36
	<b>Total</b>	<b>16</b>					
<b>Fifth Semester</b>							
5BSCCS1	Bhasha Kaushal Avam Sanchar Sadhan	2	60	8	34	-	18
5BSCCS2	Software Engineering	2	60	8	34	-	18
5BSCCS3	Physics-V	4	120	16	44	24	36
5BSCCS4	Software Engineering	4	120	16	44	24	36
5BSCCS5	Mathematics -V	4	120	16	68	-	36
	<b>Total</b>	<b>16</b>					
<b>Six Semester</b>							
6BSCCS1	English Language and Aspects of Development	2	60	8	34	-	18
6BSCCS2	Management And Information System	2	60	8	34	-	18
6BSCCS3	Physics-VI	4	120	16	44	24	36
6BSCCS4	Java	4	120	16	44	24	36
6BSCCS5	Mathematics-VI	4	120	16	68	-	36
	<b>Total</b>	<b>16</b>					

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**STUDY MODULES AND BOOKS INFORMATION**

Course Code	Name of the Course	Module to be used	Publisher
<b>SEMESTER-I</b>			
1BSCCS1	Hindi Bhasha aur Sanrachna	Module CVRU	Published by Ram Prasad & Sons
1BSCCS2	Fundamentals of Entrepreneurship	Module CVRU	Published by Ram Prasad & Sons
1BSCCS3	Physics-I	Module CVRU	Published by Ram Prasad & Sons
1BSCCS4	Fundamental Of Computing	Module CVRU	Published by Ram Prasad & Sons
1BSCCS5	Mathematics-I	Module CVRU	Published by Ram Prasad & Sons
<b>SEMESTER-II</b>			
2BSCCS1	English Language and Indian Culture	Module CVRU	Published by Ram Prasad & Sons
2BSCCS2	Development of Entrepreneur	Module CVRU	Published by Ram Prasad & Sons
2BSCCS3	Physics-II	Module CVRU	Published by Ram Prasad & Sons
2BSCCS4	Programming With C	Module CVRU	Published by Ram Prasad & Sons
2BSCCS5	Mathematics-II	Module CVRU	Published by Ram Prasad & Sons
<b>SEMESTER-III</b>			
3BSCCS1	Hindi Bhasha Avam Samvedena	Module CVRU	Published by Ram Prasad & Sons
3BSCCS2	Environmental Study-I	Module CVRU	Published by Ram Prasad & Sons
3BSCCS3	Physics-III	Module CVRU	Published by Ram Prasad & Sons
3BSCCS4	Data Structure	Module CVRU	Published by Ram Prasad & Sons
3BSCCS5	Mathematics-III	Module CVRU	Published by Ram Prasad & Sons
<b>SEMESTER-IV</b>			
4BSCCS1	English Language and Scientific Temper	Module CVRU	Published by Ram Prasad & Sons
4BSCCS2	Environmental Study-II	Module CVRU	Published by Ram Prasad & Sons
4BSCCS3	Physics-IV	Module CVRU	Published by Ram Prasad & Sons
4BSCCS4	DBMS	Module CVRU	Published by Ram Prasad & Sons
4BSCCS5	Mathematics-IV	Module CVRU	Published by Ram Prasad & Sons
<b>SEMESTER-V</b>			
5BSCCS1	Bhasha Kaushal Avam Sanchar Sadhan	Module CVRU	Published by Ram Prasad & Sons
5BSCCS2	Computer & Information Technology Basics-I	Module CVRU	Published by Ram Prasad & Sons
5BSCCS3	Physics-V	Module CVRU	Published by Ram Prasad & Sons
5BSCCS4	Software Engineering	Module CVRU	Published by Ram Prasad & Sons
5BSCCS5	Mathematics-V	Module CVRU	Published by Ram Prasad & Sons
<b>SEMESTER-VI</b>			
6BSCCS1	English Language and Aspects of	Module CVRU	Published by Ram Prasad & Sons

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	Development	CVRU			
6BSCCS2	Computer & Information Technology Basics-II	Module CVRU	Published	by	Ram Prasad & Sons
6BSCCS3	Physics-VI	Module CVRU	Published	by	Ram Prasad & Sons
6BSCCS4	Java	Module CVRU	Published	by	Ram Prasad & Sons
6BSCCS5	Mathematics-VI	Module CVRU	Published	by	Ram Prasad & Sons

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**DATE SCHEDULE & INSTRUCTIONS FOR SUBMITTING ASSIGNMENTS**

<b>DUE DATE OF SUBMISSION OF ALL ASSIGNMENTS AT THE STUDY CENTRE</b>		
<b>Semester</b>	<b>Assignment No.</b>	<b>Due Date</b>
First Semester	1BSCCS1 1BSCCS2 1BSCCS3 1BSCCS4 1BSCCS5	<ul style="list-style-type: none"> <li>• April 30 (for January Session )</li> <li>• October 31 (for July session)</li> </ul>
Second Semester	2BSCCS1 2BSCCS2 2BSCCS3 2BSCCS4 2BSCCS5	<ul style="list-style-type: none"> <li>• October 31 (for January session)</li> <li>• April 30 (for July session)</li> </ul>
Third Semester	3BSCCS1 3BSCCS2 3BSCCS3 3BSCCS4 3BSCCS5	<ul style="list-style-type: none"> <li>• April 30 (for January Session )</li> <li>• October 31 (for July session)</li> </ul>
Fourth Semester	4BSCCS1 4BSCCS2 4BSCCS3 4BSCCS4 4BSCCS5	<ul style="list-style-type: none"> <li>• October 31 (for January session)</li> <li>• April 30 (for July session)</li> </ul>
Fifth Semester	5BSCCS1 5BSCCS2 5BSCCS3 5BSCCS4 5BSCCS5	<ul style="list-style-type: none"> <li>• April 30 (for January Session )</li> <li>• October 31 (for July session)</li> </ul>
Sixth Semester	6BSCCS1 6BSCCS2 6BSCCS3 6BSCCS4 6BSCCS5	<ul style="list-style-type: none"> <li>• October 31 (for January session)</li> <li>• April 30 (for July session)</li> </ul>

**Note:** Assignments of the course are available for download at the CVRU Website <http://www.cvruc.ac.in>. You can download the assignments as per your course, follow the instructions given and submit it before due dates at the study centre.

## **INSTRUCTIONS TO STUDENTS FOR FORMATTING THE ASSIGNMENTS**

### **सत्रीय कार्य हेतु छात्रों के लिये निर्देश**

1. This booklet contains the assignments for the entire (All Semester) programme. Each course has one assignment. All assignments should be completed and submitted at IODE CVRU/ study centre before the due date.

इस पुस्तिका में पूरे पाठ्यक्रम के लिये (सभी सेमेस्टर) के सत्रीय कार्य दिये गये हैं। प्रत्येक पाठ्यक्रम के लिये एक सत्रीय कार्य दिया गया है जिसे पूर्ण करने के पश्चात निर्धारित तिथि तक डॉ. सी. वी. आर.यु. के दूरस्थ शिक्षा संस्थान / अध्ययन केन्द्र को भेजना आवश्यक है।

2. Please note that you will not be allowed to appear for the Term End Examinations for the course, until the assignments are submitted before the due date.

कृपया ध्यान रहे जब तक सत्रीय कार्य निर्धारित तिथि तक जमा नहीं होंगे, आप सत्रांत परीक्षा में नहीं बैठ सकेंगे।

3. The assignments constitute the continuous component of the evaluation process and have 30% weightage in the final grading. You need to score minimum marks as per Examinations Scheme of Particular Programme in assignment in each course in order to clear the continuous evaluation component.

सत्रीय कार्य सतत् मूल्यांकन का महत्वपूर्ण अंग है एवं अन्तिम ग्रेडिंग में 30 प्रतिशत अंक निर्धारित हैं। सतत् मूल्यांकन में उत्तीर्ण करने हेतु प्रत्येक सत्रीय कार्य में संबंधित कार्यक्रम के परीक्षा योजना के अनुसार न्यूनतम अंक प्राप्त करना अनिवार्य है।

4. The assignment should be hand written on a A-4 size paper with proper cover which contains all the required information as given on the next page. You can use the photocopy of the cover for each assignment.

सत्रीय कार्य ए-4 साइज पेपर पर हस्तलिखित होना चाहिए तथा उस पर अगले पृष्ठ पर दिये गये कवर के अनुसार सभी जानकारी लिखी

होनी चाहिए। (आप चाहें तो कवर की फोटोप्रति प्रत्येक सत्रीय कार्य पर लगाकर प्रयुक्त कर सकते हैं)

5. Leave at least 4cm margin on the left, top and bottom of your answer sheets for the evaluator's comments.

प्रत्येक पृष्ठ पर बायें, ऊपर एवं नीचे कम से कम 4 सें.मी. जगह छोड़ें जो मूल्यांकनकर्ता अपनी टिप्पणी के लिये प्रयोग करेगा।

6. Your answers should be brief, precise and in your own words. Please do not copy the answers from the study material.

सत्रीय कार्य के प्रश्नों के उत्तर संक्षेप, स्पष्ट एवं स्वयं के शब्दों में होना चाहिए। उत्तर स्टडी मटेरियल की कॉपी नहीं होना चाहिये।

7. Please do not copy the assignment from other student.

कृपया सत्रीय कार्य दूसरे छात्र से कॉपी न करें।

8. While solving the questions, clearly indicate the question number along with the part being solved. Recheck your work before submitting it.

प्रश्नों के उत्तर लिखते समय, प्रश्न संख्या अथवा उसके भाग का स्पष्ट उल्लेख करें। सत्रीय कार्य जमा करते समय एक बार पुनः जांच करें।

9. You may retain a copy of your assignment response to avoid any unforeseen situation.

सत्रीय कार्य की एक प्रतिलिपि अपने पास रखें ताकि किसी अनहोनी घटना से बचा जा सके।

10. You can resolve the difficulties you may face while studying the course material by sending an e-mail to Programme coordinator IODE CVRU/ study centre coordinator. However, the coordinator will not provide solutions to the assignment questions, since they constitute an evaluation component.

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पाठ्यक्रम सामग्री के अध्ययन के समय यदि कोई कठिनाई होती है तो उसके निराकरण हेतु कार्यक्रम समन्वयक दूरस्थ शिक्षा संस्थान डॉ. सी. वी. रामन् विष्वविद्यालय / अध्ययन केन्द्र के समन्वयक से ई-मेल द्वारा संपर्क किया जा सकता है। परंतु समन्वयक सत्रीय कार्य के प्रश्नों के उत्तर नहीं देंगे क्योंकि ये मूल्यांकन पद्धति के अंग हैं।

**Note:** Assignments of the course are available for download at the CVRU Website <http://www.cvru.ac.in> . You can download the assignments as per your course, follow the instructions given and submit it before due dates at the IODE CVRU/study centre.

