



Adichunchanagiri School of Natural Sciences

B. Sc (CS) Program

Syllabus

2024

ABOUT SCHOOL of NATURAL SCIENCES

The School of Natural Sciences of Adichunchanagiri University offers graduate and post graduate programs in Biotechnology, Biochemistry, Chemistry, Physics and Mathematics which are incredibly fascinating. It aims to attract talented youth and train them to acquire knowledge and skills useful to industrial sectors, research laboratories, and educational institutions. The School presently offers M.Sc. degree programs in Bio-Chemistry, Bio-Technology, Chemistry, Physics, Microbiology, Molecular Biology, Nanosciences and B.Sc with various combinations viz, Physics Chemistry and Mathematics, Physics, Mathematics and Computer Sciences & Physics, Chemistry and Biology. The School also facilitates research leading to Ph D in Biotechnology, Biochemistry, Physics, Chemistry, Material Science, Microbiology, Molecular Biology, Nanoscience and related areas of study.

The School of Natural Sciences is shouldered by well qualified, experienced and highly committed faculty. The state-of-the-art infrastructure digital classrooms, well equipped laboratories, conference rooms and the serene academic atmosphere at Adichunchanagiri University will enhance the transfer as well as creation of knowledge. The school provides an interactive, collaborative peer tutoring environment that encourages students to break down complex problems and develop strategies for finding solutions across a variety of situations and disciplines. The school aims to develop a learning community of critical thinkers who serves as models of innovative problems solving in the university environment to enrich their academic and professional careers.

Vision

To nurture intellect, creativity, character and professionalism among students and impart contemporary knowledge in various branches of Chemical, Biological, Physical, Mathematical and Computer Sciences that is socially relevant and transforms them to become global citizens.

Mission

To achieve excellence in studies and research through pedagogy and support interface between industry and academia

Values

- Excellence in all our academic and research endeavours
 - Dedication and service to our stakeholders
 - Leadership through innovation
 - Accountability and transparency
- Creating conducive academic environment with service motto
 - Integrity and intellectual honesty
 - Ethical and moral behaviour
 - Freedom of thought and expression
 - Adaptability to the change
 - Team-work

“The constant questioning of our values and achievements is a challenge without which neither science nor society can remain healthy”

— **Aage Niels Bohr**

B.Sc. - Program

Programme Overview

Computer science is a part of science belongs to the group of natural science. Natural science is concerned with description, prediction and understanding of natural phenomenon based on empirical evidence from observation and experimentation. Since centuries, study of computer science subject in universities has become a practice because of their importance for understanding technology, nature and life on the Universe.

The School of Natural Sciences at ADICHUNVHANAGIRI UNIVERSITY has designed to offer B.Sc. as an undergraduate degree programme to create motivated, enthusiastic, thinking and creative graduates to fill the roles as teachers, professors, scientists, professionals and administrators.

Indian economy is experiencing an upward growth right from the beginning of 21st century except for a short stint during the mid of present decade necessitating well qualified science graduates to work as teachers, professors, scientists, professionals and often administrators. At present more than 400 million youth are below 18 years of age and government is committed to increase the GER to 30% by 2020, further necessitating more number of teachers and professors to work in schools and colleges. The proposed B.Sc. programme designed will act as a foundation and first degree to prepare teachers, professors, scientists, professionals and administrators to meet the challenges of growing economy as well as to meet the growing aspirations of the youth.

The B.Sc. programme at the School of Natural Sciences has been developed by the members of the faculty based on interactions with various universities, research establishments and industries in India and abroad.

The curriculum is outcome based and it imbibes required theoretical concepts and practical skills in the domain. By undergoing this programme, students develop critical, analytical thinking and problem solving abilities for a smooth transition from academic to real-life work environment. In addition, students are trained in communication skills and interdisciplinary topics to enhance their scope. The above mentioned features of the programme, advanced teaching and learning resources, and experience of the faculty

members with their strong connections with industry and research organizations makes this programme unique.

Programme Educational Objectives (PEOs)

The programme acts as a foundation degree and helps to develop critical, analytical and problem solving skills at first level. The foundation degree makes the graduates employable in scientific organisations and also to assume administrative positions in various types of organisations. With further acquisition of higher level degrees help the graduates to pursue a career in academics or scientific organisations as a researcher.

The Programme Educational Objectives are to prepare the students to:

1. Apply fundamental knowledge of computer science for the technological applications and to understand the concepts in Physics, Chemistry, and Mathematics to solve real life problems in their chosen domain
2. Teach in schools with further relevant training and education
3. Use appropriate tools, techniques for conducting scientific investigations to solve problems in the chosen domain
4. Work alongside engineering, medical, ICT professionals and scientists to assist them in their research and development work
5. Act as administrators in public, private and government organisations with further training and education
6. Acquire higher degrees to work in colleges, universities as professors or as scientists in research establishments or business administrators
7. Understand environmental, legal, cultural, social, ethical, public safety issues
8. Work as a member of a team and communicate effectively across team members
9. Adopt lifelong learning philosophy for continuous improvement

Programme Outcomes (POs)

After undergoing this programme, a student will be able to:

1. Identify and describe basic laws and principles governing natural and man-made physical systems,
2. Explain the underlying scientific principles that govern the chemical systems
3. Explain the mathematical methods and their applications using computing softwares.
4. Derive simple mathematical relations for physical systems based on laws of physics, solve and interpret the results using programming languages.
5. Write and interpret chemical reactions using computer software.

6. Use appropriate tools and techniques for solving simple physical sciences' problems
7. Conduct experiments as per the procedures, tabulate data and interpret results
8. Work as a member of a scientific project team and communicate across teams
9. Conduct himself as a responsible citizen
10. Choose appropriate online programmes for further learning, participate in seminars.

Eligibility for B Sc Internship/Embedded program

Pass in PUC/10+2 examination with Physics, Mathematics, Chemistry, and Biology/Computer Science as compulsory subjects and obtained minimum 45% marks (40% in case of candidate belonging to SC/ST category) in the above subjects taken together of any Board recognized by the respective State Government /Central Government/Union Territories or any other qualification recognized as equivalent thereto.

B. Sc -InternshipEmbedded
Scheme of Instruction and Detailed Syllabus
(Effective from Academic Year 2024)

Scheme of Instruction

Duration: 6 Semesters (3 Years)

First Semester								
Sl No	Paper Code	Title of the Paper	CC/H C/ SC/FC	Credits	IA	Exam	Total	TeachingHours /week
1	24BKNT11	Language: Kannada-I	CC	3	40	60	100	3
2	24BHNT12	Language: Hindi-I	CC	3	40	60	100	3
3	24BENT13	Language: English-I	CC	3	40	60	100	3
4	24BFET14	Functional English-I	CC	3	40	60	100	3
5	24BCST15	Computer Science-I	HC	3	40	60	100	3
6	24BCST16	Computer Science-II (Digital computer organization)	HC	3	40	60	100	3
7	24BCST17	Computer Science-III (Computer networks)	HC	3	40	60	100	3
8	24BPET18	Energy Sources	OE	2	20	30	50	2
9	24BCET19	Chemistry-I	OE	2	20	30	50	2
10	24BMET10	Optional Mathematics-I	OE	2	20	30	50	2
11	24BEST11	Environmental Studies	FC	2	20	30	50	2
		Practicals						
13	24BCSP11	Computer Science Practical-I (C Programming lab)	HC	2	20	30	50	3
14	24BCSP12	Computer Science Practical-II (office automation and HTML tags)	HC	2	20	30	50	3
15	24BCSP13	Computer Science Practical-III (Network and data-base management)	HC	2	20	30	50	3
Total Credits				25			800	26

Second Semester								
Sl N o	Paper Code	Title of the Paper	CC/H C/ SC/F C	Credit s	IA	Exa m	Tot al	Teachin gHours /wee k
1	24BKNT21	Language: Kannada-II	CC	3	40	60	100	3
2	24BHNT22	Language: Hindi-II	CC	3	40	60	100	3
3	24BENT23	Language: English-II	CC	3	40	60	100	3
4	24BENT24	Functional English-II	CC	3	40	60	100	3
5	24BCST25	Computer Science-IV	HC	3	40	60	100	3
6	24BCST26	Computer Science-V (Data structures)	HC	3	40	60	100	3
7	24BCST27	Computer Science-VI (Python Programming)	HC	3	40	60	100	3
8	24BPET28	Astrophysics	OE	2	20	30	50	2
9	24BCET29	Chemistry-II	OE	2	20	30	50	2
10	24BMET21	Optional Mathematics-II	OE	2	20	30	50	2
		Practicals						
10	24BCSP21	Computer Science Prac- tical-IV (C++ Pro- gramming lab)	HC	2	20	30	50	3
11	24BCSP22	Computer Science Prac- tical-V (Data structures using C++)	HC	2	20	30	50	3
12	24BCSP23	Computer Science Prac- tical-VI (Getting started with python)	HC	2	20	30	50	3
Total Credits				23			700	24

I Semester

B.Sc Syllabus (SEP)

Course duration: 16 weeks with 3 hours of instruction per week

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BKNT11	Language: KAN-NADA - I	CC	3	0	0	3	3

Course Objectives:

ಘಟಕ-1.

16 Hrs

ಭೈರುವನ ರಥಕ್ಕೋಗನ ಬನ್ನಿರೋ-ಜನಪದ ಗೀತೆ
ಕೆರೆಗೆ ಹಾರ -ಜನಪದ ಗೀತೆ
ಯಾವ ಕಾಲದ ಶಾಸ್ತ್ರವೇನು ಹೇಳಿದರೇನು - ಕುವೆಂಪು.
ಗಂಗಾವತರಣ- ಅಂಬಿಕಾತನಯದತ್ತ.

ಘಟಕ 2. ವಚನಗಳು

16 Hrs

ಆಚಾರವೇ ಸ್ವರ್ಗ, ಅನಾಚಾರವೇ ನರಕ -ಬಸವಣ್ಣನ ವಚನಗಳು
ಬೇವಿನ ಹಣ್ಣು ಮೆಲ್ಲನೆ ಚುಂಬಿಸಿದರೆ ಇನಿದಹುದೆ - ಅಲ್ಲಮಪ್ರಭುವಿನ ವಚನಗಳು
ಕೇಡಿಲ್ಲದ ರೂಹಿಲ್ಲದ ಚೆಲುವಂಗಾನೊಲಿದೆನವ್ವಾ- ಅಕ್ಕಮಹಾದೇವಿ ವಚನಗಳು

ಘಟಕ-3. ಸಣ್ಣ ಕಥೆಗಳು

16 Hrs

ತುರುಚೆ ಸೊಪ್ಪಿನ ಚಿಕಿತ್ಸೆ-ಪೂರ್ಣಚಂದ್ರ ತೇಜಸ್ವಿ
ಧನಿಯರ ಸತ್ಯನಾರಾಯಣ-ಕೊರಡ್ಕಲ್ ಶ್ರೀನಿವಾಸರಾವ್
ಜ್ಯೋತಿಷಿಯ ಒಂದು ದಿನ-(ಆರ್ ಕೆ ನಾರಾಯಣ್) ಅನುವಾದ ಡಾ. ಎಚ್ ರಾಮಚಂದ್ರಸ್ವಾಮಿ

ಪರಾಮರ್ಶನ ಪುಸ್ತಕಗಳು:

1. ಕೆ.ಆರ್ ಕೃಷ್ಣಸ್ವಾಮಿ (ಸಂಪಾದಕರು), ಆದಿಚುಂಚನಗಿರಿ- ಜನಪದ ಗೀತೆಗಳ ಸಂಗ್ರಹ,ಶ್ರೀ ಆದಿಚುಂಚನಗಿರಿ ಮಹಾಸಂಸ್ಥಾನ ಮಠ, ನಾಗಮಂಗಲ ತಾಲೂಕು ಮಂಡ್ಯ ಜಿಲ್ಲೆ, 1961.
2. ಬಿ ಎಂ ಶ್ರೀಕಂಠಯ್ಯ (ಸಂಪಾದಕರು), ಕೆರೆಗೆ ಹಾರ, ಕನ್ನಡ ಬಾವುಟ, ಕನ್ನಡ ಸಾಹಿತ್ಯ ಪರಿಷತ್, ಬೆಂಗಳೂರು 2004.
3. ಕುವೆಂಪು,ಕೋಗಿಲೆ ಮತ್ತು ಸೋವಿಯತ್ ರಷ್ಯಾ, ಉದಯರವಿ ಪ್ರಕಾಶನ, ಮೈಸೂರು,1944.
4. ಅಂಬಿಕಾತನಯದತ್ತ, ಗಂಗಾವತರಣ, 1944
5. ಪ್ರೊ. ಕೆ ಮರುಳಸಿದ್ದಪ್ಪ ಹಾಗೂ ಪ್ರೊ. ನಾಗರಾಜ(ಸಂಪಾದಕರು),ವಚನ ಕಮ್ಮಟ, ಪ್ರಸಾರಾಂಗ ಬೆಂಗಳೂರು ವಿಶ್ವವಿದ್ಯಾಲಯ ಬೆಂಗಳೂರು, 1979
6. ಡಾ.ಎಲ್. ಬಸವರಾಜು (ಸಂಪಾದಕರು) ಬಸವಣ್ಣನವರ ವಚನಗಳು, ಗೀತಾ ಬುಕ್ ಹೌಸ್, ಮೈಸೂರು, 1952.
7. ಡಾ.ಎಲ್. ಬಸವರಾಜು (ಸಂಪಾದಕರು) , ಮೈಸೂರು, ಅಲ್ಲಮನ ವಚನ ಚಂದ್ರಿಕೆ- ಪ್ರಭುದೇವರ ವಚನಗಳು, ನಳಿನಿ ಶಂಕರ ಪ್ರಕಾಶನ, ಮೈಸೂರು
8. ಕಪಿ ಪೂರ್ಣಚಂದ್ರ ತೇಜಸ್ವಿ ಅವರ ಅಣ್ಣನ ನೆನಪು ಕೃತಿಯಿಂದ ಆಯ್ದುಕೊಳ್ಳಲಾಗಿದೆ., ಪುಸ್ತಕ ಪ್ರಕಾಶನ, ಮೈಸೂರು, 1996.
9. ಕೊರಡ್ಕಲ್ ಶ್ರೀನಿವಾಸರಾವ್, ನಂದಾದೀಪ, 1938.
10. ಎ.ಪಿ.ಜೆ ಅಬ್ದುಲ್ ಕಲಾಂ, (ಅನುವಾದ: ಜಿ.ಕೆ. ಮಧ್ಯಸ್ಥ),ನನ್ನ ಪಯಣ,ವಸಂತ ಪ್ರಕಾಶನ,ಬೆಂಗಳೂರು,2013.
11. ಎ.ಪಿ.ಜೆ ಅಬ್ದುಲ್ ಕಲಾಂ, (ಅನುವಾದ: ಜಿ.ಕೆ. ಮಧ್ಯಸ್ಥ),ಟರ್ನಿಂಗ್ ಪಾಯಿಂಟ್,ವಸಂತ ಪ್ರಕಾಶನ, ಬೆಂಗಳೂರು,2012.

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BHNT12	Language: Hindi - I	CC	3	0	0	3	3

पाठ्यक्रम रूपरेखा

यह पाठ्यक्रम नौसिखिया, अपनी भाषा की क्षमता का विकास करने हेतु तथा विभिन्न साहित्यिक प्रक्रियाओं द्वारा समाज, संस्कृति एवं जीवन के मूल्यों को समझने हेतु अभिकल्पित है।

पाठ्यक्रम उद्देश्य :

- संदर्भानुसार उचित भाषा का प्रयोग करने की दक्षता को छात्रों में उत्पन्न करना।
- साहित्य के माध्यम से समाज एवं मानवीय मूल्यों को समझाकर, उन मूल्यों की रक्षा हेतु प्रेरित करना।
- छात्रों में पुस्तक पठन एवं लेखन की अकृतिम प्रवृत्ति स्थापित करना।
- अध्येताओं में साहित्य के माध्यम से प्रभावी एवं कुशल संचार का विकास करना।

अधिगम परिणाम

अध्ययन की समाप्ति पर अध्येता –

- सामाजिक मूल्य एवं नैतिक जवाबदेही को स्वीकार कर सकता है।
- साहित्य की प्रासंगिकता को जीवन में समझने की दक्षता रखता है।
- समाज में अंतर्निहित पद्धतियाँ एवं विचारधाराओं का व्याख्यान करने में सक्षम बन सकता है।

अध्ययन विषय सूची / पाठ्यक्रम

इकाई – 1: कहानी, संस्मरण

16 Hrs

1. कहानी – नशा – प्रेमचंद
2. कहानी – सुखमय जीवन – चंद्रधर शर्मा गुलेरी
3. संस्मरण – शरत के साथ बिताया कुछ समय – अमृतलाल नागर

इकाई – 2: कहानी, आत्मकथा

16 Hrs

4. कहानी – मरने से पहले – भीष्म साहनी
5. कहानी – लाल हवेली – शिवानी
6. आत्मकथा – जेल- जीवन की झलक - गणेश शंकर विद्यार्थी

इकाई – 3: कहानी, व्यंग्य रचना

16 Hrs

7. कहानी – चाय का एक प्याला – कैथरीन मैन्सफील्ड
8. व्यंग्य रचना – भेड़े और भेड़ियें – हरिशंकर परसाई

सूचना : पाठ ३. प्रणाम और ६. निराला : एक आकर्षित व्यक्तित्व के स्थान पर ३. शरत के साथ बिताया हुआ कुछ समय और ६. जेल जीवन की झलक पाठ को चयन करके, पाठ्यक्रम में संशोधन किया गया है।

सन्दर्भ ग्रन्थ :

- पाठ्य पुस्तक – रेवा विश्वविद्यालय
- सुबोध व्यवहारिक हिन्दी – डॉ. कुलदीप गुप्त
- अभिनव व्यवहारिक हिन्दी – डॉ. परमानन्द गुप्त
- हिन्दी साहित्य का इतिहास - डॉ. नागेन्द्र
- आधुनिक हिन्दी साहित्य का इतिहास - डॉ. बच्चन सिंह
- हिन्दी साहित्य का नवीन इतिहास - डॉ. लाल साहब सिंह
- शुद्ध हिन्दी कैसे बोले कैसे लिखे- पृथ्वीनाथ पाण्डे
- कार्यालय अनुवाद निदेशिका
- संक्षेपण और पल्लवन - के.सी. भाटिया&तुमन सिंग

सूचना : पाठ ३. प्रणाम और ६. निराला : एक आकर्षित व्यक्तित्व के स्थान पर ३. शरत के साथ बिताया हुआ कुछ समय और ६. जेल जीवन की झलक पाठ को चयन करके, पाठ्यक्रम में संशोधन किया गया है।

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BENT13	Language: ENGLISH - I	CC	3	0	0	3	3

Course Objectives:

- To equip students with the ability to acquire the functional use of language in context.
- To motivate the students to explore and critique issues related to society and Ethics.
- To develop in the students a genuine habit of reading and writing leading to effective and efficient communication.

Course Outcomes:

On completion of the course, learners will be able to:

- Demonstrate ethical responsibilities in taking cognizance of issues relating to society and values.
- Develop an understanding of literature in context.
- Interpret and paraphrase their ideas logically and cohesively.
- Illustrate the systems and ideologies inherent in the society.

Unit-I: Values and Ethics 16 Hrs

Literature:

Rabindranath Tagore - Where the Mind is Without Fear, William Wordsworth – Three Years She Grew in Sun and Shower, Saki – The Lumber-room, William Shakespeare – Extract from *Julius Caesar* (Mark Antony's Speech).

Unit-II: Natural & Super Natural 16 Hrs

Literature:

The Fir Tree - Hans Christian Anderson, The Signal Man - Charles Dickens, On Killing a Tree - Gieve Patel, Poison Tree - William Blake.

Unit-III: Dalit Literature 16 Hrs

Literature: Those who sold themselves - Devanooru Mahadeva, Copper Coin and Well Water - Aravinda Malagatti, Treatment of Untouchable - Gurudas Alam.

Reference Books:

1. Tagore, Rabindranath. *Gitanjali*. Rupa Publications, 2002.
2. Wordsworth, William. *The Complete Works of William Wordsworth*. Andesite Press, 2017.
3. Munro, Hector Hugh. *The Complete Works of Saki*. Rupa Publications, 2000.
4. Shakespeare, William. *The Complete Works of William Shakespeare*. Sagwan Press, 2015.
5. Chindhade, Shirish. *Five Indian English Poets: Nissim Ezekiel, A.K. Ramanujan, ArunKolatkarr, DilipChitre, R. Parthasarathy*. Atlantic Publications, 2011.
6. Dickens, Charles. *The Signalman and Other Horrors: The Best Victorian Ghost Stories of Charles Dickens: Volume 2*. Create space Independent Publications, 2015.
7. Anderson, Hans Christian. *The Fir Tree*. Dreamland Publications, 2011.
8. Colvin, Sidney (ed). *The Works of R. L. Stevenson. (Edinburgh Edition)*. British Library, Historical Prints Edition, 2011.
9. Bishop, Elizabeth. *Poems*. Farrar, Straus and Giroux, 2011.
10. Swift, Jonathan. *Gulliver's Travels*. Penguin, 2003.
11. Dickinson, Emily. *The Complete Poems of Emily Dickinson*. Createspace Independent Publications, 2016.
12. Brooke, Rupert. *The Complete Poems of Rupert Brooke*. Andesite Press, 2017.
13. King, Martin Luther Jr. & James M. Washington. *I Have a Dream: Writings And Speeches That Changed The World*. Harper Collins, 1992.
14. Keller, Helen. *The Story of My Life*. Fingerprint Publishing, 2016.
15. Green, David. *Contemporary English Grammar Structures and Composition*. New Delhi: MacMillan Publishers, 2010.
16. Thorpe, Edgar and Showick Thorpe. *Basic Vocabulary*. Pearson Education India, 2012

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BENT14	Functional English - I	CC	3	0	0	3	3

Course Objectives

- Facilitate the learners in acquiring listening and speaking competencies
- Assist the learners in independent language comprehension and production
- Make the students aware of the different communicative functions of English
- Develop the language skills in English.

Course Outcomes

On completion of the course, students will be able to:

- Interpret audio files and comprehend different spoken discourses/ excerpts in different accents(Listening Skills).
- Demonstrate speaking ability with clarity, confidence and comprehension and communicate with one or many listeners using appropriate communicative strategies (Speaking Skills).
- Make use of reading different genres of texts adopting various reading strategies (Reading Skills).
- Develop the ability to write cohesively, coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic (Writing Skills).

Unit-01: Introduction to English Language and Basic Grammar 16Hrs

1. Importance of learning English, English as an International Language
2. Parts of Speech
3. The Sentences, Clause, Phrase
4. Articles
5. Use of Auxiliaries and Modals

Unit-02: Contextual Use of Modern Grammar 16Hrs

1. Tenses
2. Verb forms and Uses
3. Framing Questions
4. Question tags

Unit-03: Greetings 16Hrs

1. Introducing Oneself
2. Introducing Others
3. Offering Help
4. Congratulating
5. Apologizing
6. Expressing Gratitude

Reference Books:

1. Bansal, R.K. and J.B. Harrison. *Spoken English*. Orient Blackswan, 2013.
2. Raman, Meenakshi and Sangeeta Sharma. *Technical Communication*. Oxford University Press, 2015.
3. Thorpe, Edgar and Showick Thorpe. *Objective English*. Pearson Education, 2013.
4. Dixon, Robert J. *Everyday Dialogues in English*. Prentice Hall India Pvt Ltd., 1988.
5. Turton, Nigel D. *ABC of Common Errors*. Mac Millan Publishers, 1995.
6. Samson, T. (ed.) *Innovate with English*. Cambridge University Press, 2010.
7. Kumar, E Suresh, J. Savitri and P Sreehari (ed). *Effective English*. Pearson Education, 2009.
8. Goodale, Malcolm. *Professional Presentation*. Cambridge University Press, 2013.

Course code	Course title	Course type	L	T	P	C	Hrs/Week
24BCST15	Computer Science- I	HC	3	0	0	3	3

Course Objectives:

- ☐ To understand basic computer concepts and architecture.
- ☐ To gain proficiency in programming with C.
- ☐ To develop problem-solving skills using programming constructs.
- ☐ To understand and apply fundamental programming techniques.

Course Outcomes (COs):

- ☐ Understand and describe the fundamental components and architecture of computer systems, including hardware and software components.
- ☐ Demonstrate proficiency in using basic programming constructs and syntax in the C programming language.
- ☐ Apply control structures (such as loops and conditionals) and functions to solve programming problems in C.
- ☐ Develop and manipulate arrays and strings in C, and utilize them in practical programming scenarios.
- ☐ Implement and use pointers in C to handle memory dynamically and perform file operations.
- ☐ Write, compile, and debug simple C programs to solve computational problems and understand the process of program execution.

Unit I

16 Hrs

Computer Fundamentals: Definition of a Computer, Types of Computers, Basic Computer Architecture, Components of a Computer System.

Introduction to Programming Concepts: Software, Classification of Software, Modular Programming, Structured Programming, Algorithms and Flowcharts with examples., File Systems and Basic File Operations..

Overview of C Language: History of C, Character set, C tokens, Identifiers, Keywords, Data types, Variables, Constants, Symbolic Constants, Operators in C, Hierarchy of Operators, Expressions, Type Conversions and Library Functions.

Unit-II

16 Hrs

Managing Input and Output Operation: Formatted and Unformatted I/O Functions Decision making, **branching and looping:** Decision Making Statements - if Statement, if- else statement, nesting of if-else statements, else-if ladder, switch statement, operator, Looping - while, do-while, for loop, Nested loop, break, continue, and goto statements.

Functions: Function Definition, prototyping, types of functions, passing arguments to functions, Nested Functions, Recursive functions.

Unit-III

16 Hrs

Arrays: Declaring and Initializing, One Dimensional Arrays, Two Dimensional Arrays, Multi-Dimensional Arrays - Passing arrays to functions.

Strings: Declaring and Initializing strings, Operations on strings, Arrays of strings, passing strings to functions. Storage Classes - Automatic, External, Static and Register Variables.

Course code	Course title	Course type	L	T	P	C	Hrs/Week
24BCSP11	Computer Science Practical-I (C Programming lab)	HC	0	0	3	2	3

Course Objectives:

1. Understand the use of C compiler.
2. Demonstrate the basic C concepts to execute simple programs

Course Outcomes (COs):

1. Creation of C program using control statements and arrays
2. Perform the string functions and using a user defined functions.
3. Create structure of student using data members and pointers.

Practical contents:

1. Write a program to interchange two variables with using third variable
2. Write a program to interchange two variables without using third variable.
3. Write a program to illustrate if –else control statement (check the given number is even or odd)
4. Write a program to illustrate while loop.
5. Write a program to illustrate do while loop
6. Write a program to illustrate for loop
7. Write a program to read and display of numbers using an array.
8. Write a program to perform string functions (strcmp, strcmp, strcpy)
9. Write a program to create structure of student using data members like reg no, name and fees and display the data members.
10. Write a program to illustrate pointers.

Course code	Course title	Course type	L	T	P	C	Hrs/Week
24BCST16	Computer Science-II (Digital Computer Organization)	HC	3	0	0	3	3

Course Objectives:

1. Understand the concepts of computer languages and language translators.
2. Demonstrate the Boolean algebra and Karnaugh map.
3. Understand the basic concepts of electrical and electronics components.

Course Outcomes (COs):

1. Understand the digital computer system including classification of computers, anatomy of computer, memory organisation of computer.
2. Illustrate the types of software, computer languages and translators.
3. Apply Boolean Algebra and to simplify logical expressions and problem solving using Karnaugh maps
4. Design and perform the adders, subtractors, flip flops

Unit 1

Overview of computers: introduction to computer, evolution and history of computer, basic organisation of digital computers
Computer languages: machine level, assembly level and high level languages
Language translators: Assembler, Interpreter and compiler

Unit 2

Number system: introduction to number system conversion, addition, subtraction in binary system, 1's and 2's complement method, weighted and non weighted number system

Unit 3

Boolean algebra: Basic laws (properties of 0's and 1's, complementary law, idempotence law, involution law, commutative law, associative law, distributive law), principle of duality And Karnaugh map (4 variables)
EEE- electrical and electronics engineering
Logic circuits: half and full adder, half and full subtractor, flip-flops and multiplexer

Course code	Course title	Course type	L	T	P	C	Hrs/Week
24BCSP12	Computer Science Practical-II (Office automation and HTML tags)	HC	0	0	3	2	3

Course Objectives:

1. Understand the use of office automation tools and HTML tags
2. Design and create documents , spreadsheets , presentations and using of HTML tages

Course Outcomes (COs):

1. Confidently work on office automation software such as word processor, spreadsheets and power point.
2. Understand the wed programming basics and create simple web pages using HTML

Practical contents:

1. Using word processor
 - a. Creating table
 - b. Entering appropriate data into table
 - c. Sorting the table
 - d. Applying the formulas on table numeric values
2. Using word processor create mail merge
3. Using spread sheet
 - a. Enter employee code , name and basic salary
 - b. Calculate DA,HRA,CCA ,total salary
 - c. Calculate deduction and net salary
4. Using spread sheet
 - a. Create records for the following: roll no, student name,M1 ,M2,M3 ,total, percentage and result
 - b. Calculate total and percentage using formulas
 - c. Update result column
5. Using power point,
 - a. Create presentation slides with titles,sub titles and charts choosing different slide layout
 - b. Use design template for background
 - c. Formate the slide design
6. Using power point,
 - a. “ Components of PC ” using organisation chart
 - b. Insert images, shapes and tabulates of data.
 - c. Transitions, animation and slide show
7. Design a page having suitable background colour and text colour with the title my first resume usingbasic HTML tags
8. Create a study time table using table tags
9. Write html code to design a page containing some text in to a paragraph by using suitable headings ,lists etc.
10. Write a html code to create a web page for moving message.

Course code	Course title	Course type	L	T	P	C	Hrs/Week
24B CST17	Computer Science-III (Computer networks)	HC	3	0	0	3	3

Course Objectives:

1. Understand the basic concepts of computer networks.
2. Understand the organisation of network topologies and transmission media.
3. Understand the concept of DBMS features, data models and ER diagrams.
4. Understand the concept of Structure query language command and functions.

Course Outcomes (COs):

1. Understand the network devices , topologies and transmission media.
2. Design of data models and ER diagrams using Data Base Managemnt system
3. Apply SQL commands to create , insert and alter table
4. Using SQL group and scalar functions upate of tables.

Course contents:

Unit 1

overview of computer networks : introduction to network, network devices, network topologies (Bus,tree, ring, mesh,star) ,uses of network, transmission media(modem, hub,ethernet card, switch,bridge)

Unit 2

DBMS (Database management system): basic concepts of data base, features of database, manual and computerized database, data models (network model, hierarchical model, relational model), ER diagrams(entity, attribute, relationship)

Unit 3 SQL (structure query language) Introduction to SQL , SQL commands (create ,insert, update,alter), date types (character type, numeric type, date and time type), group functions(count, max,min,avg, sum) and scalar functions(Numeric ,character, date, conversion)

Course code	Course title	Course type	L	T	P	C	Hrs/Week
24BCSP13	Computer Science Practical-III (Network and data-base management)	HC	0	0	3	2	3

Cou

Course Objectives:

1. Identifying the internal components of computer system.
2. Identifying the network components like network topology, domain names and protocols.
3. Using of Access create data base tables
4. Create table using SQL commands

Course Outcomes (COs):

1. Develop practical skills of identifying hardware components.
2. Design the data base using MS-Access
3. Implement the SQL commands to create table and changing of data

Practical

1. Assembling and disassembly of computer system.
2. Identifying the computer hardware components(motherboard,hard disk, registers etc)
3. Identifying the network components and network topology
4. Using internet overview of network protocols,domain names etc.
5. Using MS Access, a. Creating table using rows and columns b. Inserting data according to tablecreation c. Generating report
6. Using MS Access a. Create student database (I'd no , name, DOB etc) b. According to course wise generate reports.
7. Using word processor i. Design data models ii. ER diagram (notations)
8. Create table using basic SQL commands
9. Generate student details: i. Create a table name student ii. iii.
10. Insert records (id no , name, M1,M2,M3,total) according to student details Update table based on condition and using delete command Generate electricity billing.

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BPET18	Energy Sources	OE	2	0	0	2	2

Course Objectives:

To study the concepts of energy resources, renewable and non-renewable energy, wind and tidal energy, solar energy sources.

Course Outcomes:

On completion of the course students will be able to:

1. Understand the Primary and Secondary energy, Commercial and Non-commercial energy, Renewable and Non-renewable energy, Conventional and Non-conventional energy
2. Understand the Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, and Hydroelectricity.
3. Understand the Solar Energy, Merits & demerits of solar energy, Applications of solar energy, Photovoltaics, Need and characteristics of photovoltaic (PV) systems.
4. Understand Geothermal Resources, Geothermal Technologies. Hydropower resources, hydropower technologies, Carbon captured technologies, cell, batteries, and power consumption.

UNIT-I:

12 hours

Introduction: Energy concept-sources in general, its significance & necessity. Classification of energy sources: Primary and Secondary energy, Commercial and Non-commercial energy, Renewable and Non-renewable energy, Conventional and Non-conventional energy, Based on Origin-Examples and limitations. Importance of Non-commercial energy resources.

Conventional energy sources: Fossil fuels & Nuclear energy- production & extraction, usage rate and limitations. Impact on environment and their issues & challenges. Need of eco-friendly & green energy & their related technology.

UNIT-II:

12 hours

Introduction: Need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, Hydroelectricity.

Solar energy: Solar Energy-Key features, its importance, Merits & demerits of solar energy, Applications of solar energy. Solar water heater, solar cooker, solar green houses, solar cell -brief discussion of each. Photovoltaics, Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits.

UNIT-III:

12 hours

Wind and Tidal Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines. Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices. Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy.

Geothermal and hydro energy: Geothermal Resources, Geothermal Technologies. Hydropower resources, hydropower technologies, environmental impact of hydro power sources. Carbon captured technologies, cell, batteries, and power consumption.

Reference Book

1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
2. Solar energy - M P Agarwal - S Chand and Co. Ltd.
3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
4. Godfrey Boyle, "Renewable Energy, Power for a sustainable future", 2004, Oxford University Press, in association with The Open University.
5. Dr. P Jayakumar, Solar Energy: Resource Assessment Handbook, 2009
6. J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BCET19	Chemistry In Daily Life	OE	2	0	0	2	2

Course Objectives:

To study Concepts of Dairy Products, Vitamins, Chemical and Renewable Energy Sources

Course Outcomes:

On completion of the course students will be able to:

- Understand the chemical constituents in various day to day materials using by a common man.
- Understand the chemical constituents in vitamins, soaps and detergents.
- Understand the renewable chemical energy resources.
- Understand different types of polymers and their applications.

Unit- I: Dairy Products:

12 hours

Composition of milk and milk products. Analysis of fat content, minerals in milk and butter. Estimation of added water in milk. Beverages: Analysis of caffeine in coffee and tea, detection of chicory in coffee, chloral hydrate in toddy, determination of methyl alcohol in alcoholic beverages. Food additives, adulterants, and contaminants- Food preservatives like benzoates, propionates, sorbates, disulphites. Artificial sweeteners: Aspartame, saccharin, dulcin, sucralose, and sodium cyclamate. Flavors: Vanillin, alkyl esters (fruit flavors), and monosodium glutamate. Artificial food colorants: Coal tar dyes and non-permitted colors and metallic salts. Analysis of pesticide residues in food.

Unit- II: Vitamins:

12 hours

Classification and Nomenclature. Sources, deficiency diseases, and structures of Vitamin A1, Vitamin B1, Vitamin C, Vitamin D, Vitamin E & Vitamin K. Oils and fats: Composition of edible oils, detection of purity, rancidity of fats and oil. Tests for adulterants like argemone oil and mineral oils. Halphen test. Soaps & Detergents: Definition, classification, manufacturing of soaps and detergents, composition and uses.

Unit- III: Chemical and Renewable Energy Sources:

12 hours

Principles and applications of primary & secondary batteries and fuel cells. Basics of solar energy, future energy storer. Polymers: Basic concept of polymers, classification and characteristics of polymers. Applications of polymers as plastics in electronic, automobile components, medical fields, and aerospace materials. Problems of plastic waste management. Strategies for the development of environment-friendly polymers.

REFERENCE BOOKS

- [1].K. Sharma: Introduction to Industrial Chemistry, Goel Publishing, Meerut (1998)
- [2].Ashtoush Kar: Medicinal Chemistry.
- [3].H.E. Cox: Analysis of Foods.
- [4].H.E. Cox and Pearson: Chemical Analysis of Foods.

- [5].N. Shakuntala Many and S. Swamy: Foods: Facts and Principles. 4th Ed. New Age International (1998).
- [6].P.I. Atkins and J. de Paula: Physical Chemistry, 7th Ed. 2002, Oxford University Press.
- [7].Swaminathan and Goswamy: Handbook on Fertilizer Technology 6th Ed. 2001, FAI.
- [8].I.L. Finar: Organic Chemistry by Vol. 1 & 2.
- [9].J. R. Fired: Polymer Science and Technology, Prentice H

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BMET10	OPTIONAL MATHEMATICS-1	OE	2	0	0	2	2

Course Objectives: To study the concept of linear equations and to solve the equations and to learn the techniques of differentiation of function using real variables.

Course Learning Outcomes: This course will enable the students to

- Ability to learn and solve system of linear equations.
- To Solve the system of homogeneous and non-homogeneous m linear equations.
- Students will be familiar with the techniques of differentiation of function with real variables.

Unit 1: Matrices

12 hours

Recapitulation of Symmetric and Skew Symmetric matrices, Algebra of Matrices; Row and column reduction, Echelon form. Rank of a matrix; Inverse of a matrix by elementary operations; Solution of system of linear equations; Criteria for existence of non-trivial solutions of homogeneous system of linear equations. Solution of non-homogeneous system of linear equations. Cayley- Hamilton theorem, inverse of matrices by Cayley-Hamilton theorem (Without Proof).

Unit-II: Theory of equations:

12 hours

Euclid's algorithm, Polynomials with integral coefficients, Remainder theorem, Factor theorem, Fundamental theorem of algebra(statement only), Irrational and complex roots occurring in conjugate pairs, Relation between roots and coefficients of a polynomial equation, Symmetric functions.

Unit-III: Polar Co-ordinates:

12 hours

Polar coordinates, angle between the radius vector and tangent. Angle of intersection of two curves (polar forms), length of perpendicular from pole to the tangent, pedal equations. Derivative of an arc in Cartesian, parametric and polar forms, curvature of plane curve-radius of curvature formula in Cartesian, parametric and polar and pedal forms- center of curvature, circle of curvature.

Reference Books:

1. University Algebra - N.S. Gopala Krishnan, New Age International (P) Limited.
2. Algebra – Natarajan, Manicavasagam Pillay and Ganapathy.
3. Theory of Matrices - B S Vatsa, New Age International Publishers.
4. Matrices – A. R. Vasista, Krishna Prakashana Mandir.
5. Applications of Calculus, Debasish Sengupta, Books and Allied (P) Ltd., 2019.
6. Differential Calculus - Shanti Narayan, S. Chand & Company, New Delhi.
7. Calculus – Lipman Bers, Holt, Rinehart & Winston.
8. Calculus – S. Narayanan & T. K. Manicavachogam Pillay, S. Viswanathan Pvt. Ltd., 15 vol. I & II.
9. Schaum's Outline of Calculus - Frank Ayres and Elliott Mendelson, 5th ed. USA: Mc. Graw.

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24B EST11	Environmental Studies	FC	2	0	0	2	2

Unit-I

12 hours

Multidisciplinary Nature of Environmental Studies: Introduction to Environment, objectives and guiding principles of environmental education, Components of environment, Structure of atmosphere, Sustainable environment/Development, Impact of technology on the environment in terms of modern agricultural practices and industrialization, Environmental Impact Assessment.

Environmental protection – Role of Government-Assignments of MOEF, Functions of central and state boards, Institutions in Environment and People in Environment, Initiative and Role of Non-government organizations in India and world.

Self study: Need for public awareness on the environment, Gaia Hypothesis

Unit-II

12 hours

Environmental Pollution – Definition, sources and types, Pollutant-Definition & classification, Concepts of air pollution, water pollution, Soil pollution, Automobile pollution-Causes, Effects & control measures.

Self study: Case studies of London smog, Bhopal gas tragedy, marine pollutions and study of different waste water treatment processes.

Environmental degradation – Introduction, Global warming and greenhouse effect, Acid rain-formation & effects, Ozone depletion in stratosphere and its effect.

Solid Waste management – Municipal solid waste, Biomedical waste, Industrial solid waste and Electronic waste (E-Waste).

Self study: Disaster management, early warning systems-bio indicators for Tsunami and other natural disasters.

Unit-III

12 hours

Energy – Definition, classification of energy resources, electromagnetic radiation-features and applications, Conventional/Non-renewable sources – Fossil fuels based(Coal, petroleum & natural gas), nuclear energy, Non-conventional/renewable sources – Solar, wind,hydro, biogas, biomass, geothermal, ocean thermal energy, Hydrogen as an alternative as a future source of energy.

Self study: Remote sensing and its applications, Chernobyl (USSR) nuclear disaster and Fukushima (Japan) nuclear disaster.

Natural resources –water resource (Global water resource distribution, Water conservation methods, Water quality parameters, Uses of water and its importance), Mineral resources (Types of minerals, Methods of mining & impacts of mining activities), Forest wealth (Importance's, Deforestation-Causes, effects and controlling measures)

Self study: Hydrology & modern methods adopted for mining activities.

Reference Books:

1. “Environmental Studies”, by R.J. Ranjit Daniels and JagadishKrishnaswamy, (2017), Wiley India Private Ltd., New Delhi, Co-authored & Customised by Dr.MS Reddy & Chandrashekar.
2. “Environmental Studies”, by R.J. Ranjit Daniels and JagadishKrishnaswamy, (2009), Wiley India Private Ltd., New Delhi.
3. “Environmental Studies” by Benny Joseph, Tata McGraw – Hill Publishing Company Limited.
4. Environmental Studies by Dr.S.M.Prakash, Elite Publishers Mangalore, 2007
5. Rajagopalan R. 2005, ”Environmental Studies – from Crisis to cure”, Oxford University Press
6. Environmental Science by Arvind walia, Kalyani Publications, 2009.
7. Environmental Studies by AnilkumarDey and Arnab kumarDey.

II Semester
B.Sc Syllabus (SEP)
Course duration: 16 weeks with 3 hours of instruction per week

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BKNT21	Language: KANNADA – II	CC	3	0	0	3	3

Course Objectives:

ನಾಲ್ಕು ಸೆಮಿಸ್ಟರ್‌ಗಳಲ್ಲಿ ಸಮಗ್ರ ಕನ್ನಡ ಸಾಹಿತ್ಯವನ್ನು ಪರಿಚಯಿಸುವ ಉದ್ದೇಶವನ್ನು ಹೊಂದಿದೆ. ಅದರಂತೆ ಎರಡನೆಯ ಸೆಮಿಸ್ಟರ್‌ನಲ್ಲಿ ಪ್ರಾಚೀನ, ಮಧ್ಯಕಾಲೀನ ಕಾವ್ಯಗಳು, ಲೇಖನಗಳು ಹಾಗೂ ಪ್ರವಾಸ ಕಥನ ಸಾಹಿತ್ಯವನ್ನು ಪಠ್ಯವನ್ನಾಗಿ ಆಯ್ಕೆ ಮಾಡಿಕೊಂಡು, ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯದ ಬಗ್ಗೆ ಸದಭಿರುಚಿಯನ್ನು ಮೂಡಿಸಲಾಗುತ್ತದೆ. ಸಾಂಸ್ಕೃತಿಕ ತಿಳುವಳಿಕೆಯ ಜೊತೆಗೆ ವ್ಯಕ್ತಿತ್ವ ವಿಕಸನದ ಕಡೆಗೆ ಗಮನ ನೀಡಲಾಗುತ್ತದೆ.

- ಭಾಷೆ, ಸಾಹಿತ್ಯ, ಇತಿಹಾಸ ಮತ್ತು ಸಂಸ್ಕೃತಿಗಳನ್ನು ಕನ್ನಡ, ಕರ್ನಾಟಕಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ ಪರಿಚಯಿಸಲಾಗುತ್ತದೆ.
- ವಿದ್ಯಾರ್ಥಿಗಳ ಸರ್ವತೋಮುಖ ಬೆಳವಣಿಗೆಗೆ ಅನುವಾಗುವಂತೆ ಹಾಗೂ ಅವರಲ್ಲಿ ಮಾನವ ಸಂಬಂಧಗಳ ಬಗ್ಗೆ ಗೌರವ, ಸಮಾನತೆ ಮೂಡಿಸಿ, ಬೆಳೆಸುವ ನಿಟ್ಟಿನಲ್ಲಿ ಪಠ್ಯಗಳ ಆಯ್ಕೆಯಾಗಿದೆ.
- ಅವರಲ್ಲಿ ಸೃಜನಶೀಲತೆ, ಶುದ್ಧ ಭಾಷೆ, ಉತ್ತಮ ವಿಮರ್ಶಾ ಗುಣ, ನಿರರ್ಗಳ ಸಂಭಾಷಣೆ, ಭಾಷಣ ಕಲೆ ಹಾಗೂ ಬರಹ ಕೌಶಲ್ಯಗಳನ್ನು ಬೆಳೆಸುವುದು ಗುರಿಯಾಗಿದೆ.
- ಸ್ಪರ್ಧಾತ್ಮಕ ಪರೀಕ್ಷೆಗಳಿಗೆ ಅನುಕೂಲವಾಗುವಂತಹ ವಿಷಯಗಳನ್ನು ಗಮನದಲ್ಲಿಟ್ಟುಕೊಂಡು ಸೂಕ್ತ ಪಠ್ಯಗಳನ್ನು ಆಯ್ಕೆ ಮಾಡಿಕೊಳ್ಳಲಾಗಿದೆ.

Course Outcomes:

ಪ್ರಾಚೀನ, ಮಧ್ಯಕಾಲೀನ ಕಾವ್ಯಗಳು, ಹೊಸಗನ್ನಡದ ಲೇಖನಗಳು ಹಾಗೂ ಪ್ರವಾಸ ಕಥನ ಸಾಹಿತ್ಯ ಕಲಿಕೆಯ ಮೂಲಕ ಕಾಲದ ಸ್ಥಿತ್ಯಂತರಗಳನ್ನು ಅದರ ಒಳನೋಟಗಳನ್ನು ಬೆಳೆಸುತ್ತದೆ.

- ಸಾಮಾಜಿಕ, ರಾಜಕೀಯ, ಧಾರ್ಮಿಕ, ಸಾಂಸ್ಕೃತಿಕ ಹಾಗೂ ಲಿಂಗಸಂಬಂಧಿ ವಿಚಾರಗಳೆಡೆ ಗಮನಹರಿಸುವುದರೊಂದಿಗೆ ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಚರ್ಚಾ ಮನೋಭಾವವು ಬೆಳೆಯುತ್ತದೆ.
- ಜೀವನದಲ್ಲಿ ಬರುವ ಅಭಿಪ್ರಾಯ ಬೇಧಗಳು, ಸಮಸ್ಯೆಗಳನ್ನು ಆಧುನಿಕ ಸಂದರ್ಭದಲ್ಲಿ ಮಾನವೀಯತೆಯೊಂದಿಗೆ ನಿರ್ವಹಿಸುವಂತೆ ಪ್ರೇರೇಪಿಸುತ್ತದೆ.
- ಉತ್ತಮ ಸಂವಹನ ಕಲೆಯನ್ನು ಬೆಳೆಸುವ ಉದ್ದೇಶವನ್ನು ಈಡೇರಿಸುತ್ತದೆ.

ಘಟಕ-1. ಕವನಗಳು

16 Hrs

1. ಕತ್ತೆ ಮತ್ತು ಧರ್ಮ - ಸಿದ್ದಲಿಂಗಯ್ಯ
2. ರಾಣಿ ತಿಮ್ಮಿಯ ಸಿಂಹಾಸನ-ವಿಜಯದಬ್ಬೆ
3. ಅಮ್ಮ, ಆಚಾರ, ನಾನು- ಕೆ.ಎಸ್. ನಿಸಾರ್ ಅಹಮದ್
4. ಪೆಟ್ರೋಮ್ಯಾಕ್ಸ್ ಹೊತ್ತವರು- ಜಂಬಣ್ಣ ಅಮರಚಿಂತ

ಘಟಕ 2. ಕೀರ್ತನೆಗಳು ಮತ್ತು ತತ್ವ ಪದಗಳು.

16

Hrs

1. ಆಚಾರವಿಲ್ಲದ ನಾಲಿಗೆ ನೀಚ ಬುದ್ಧಿಯ ಬಿಡು ನಾಲಿಗೆ- ಪುರಂದರದಾಸರ ಕೀರ್ತನೆ
2. ಸತ್ಯವಂತರ ಸಂಗವಿರಲು ತೀರ್ಥವೇತಕೆ- ಕನಕದಾಸರ ಕೀರ್ತನೆ
3. ಎಂಥಾ ಮೋಜಿನ ಕುದರಿ- ಸಂತ ಶಿಶುನಾಳ ಶರೀಫರ ತತ್ವ ಪದಗಳು.

ಘಟಕ-3. ಲೇಖನಗಳು

16 Hrs

1. ನಾಸ್ರಾ ಗೆರೆಗಳ ಮೇಲೆ-ನೇಮಿಚಂದ್ರ (ಪ್ರವಾಸಿ ಕಥನ).
2. ಆಟಿ ತಿಂಗಳ ಆಚರಣೆಯ ಅಚ್ಚರಿಗಳು-ಐತಿಚಂಡ ರಮೇಶ್ ಉತ್ತಪ್ಪ.
3. ಬೆಂಗಳೂರು ನಗರವೆಂಬ ಒಂದು ಹಳ್ಳಿ- ಬರಗೂರು ರಾಮಚಂದ್ರಪ್ಪ.

ಪರಾಮರ್ಶನ ಪುಸ್ತಕಗಳು

1. ಕೆಪಿ ಪೂರ್ಣಚಂದ್ರ ತೇಜಸ್ವಿ ಅವರ ಅಣ್ಣನ ನೆನಪು ಕೃತಿಯಿಂದ ಆಯ್ದುಕೊಳ್ಳಲಾಗಿದೆ., ಪುಸ್ತಕ ಪ್ರಕಾಶನ, ಮೈಸೂರು, 1996.

2. ಕೊರಡ್ಕಲ್ ಶ್ರೀನಿವಾಸರಾವ್, ನಂದಾದೀಪ, 1938.
3. ಇಂಗ್ಲಿಷ್ ಮೂಲ: ಆರ್ ಕೆ ನಾರಾಯಣ್,ಮಾಲ್ಗುಡಿಯ ದಿನಗಳು, (ಅನುವಾದ: ಡಾ.ಎಚ್ ರಾಮಚಂದ್ರಸ್ವಾಮಿ), ಪ್ರಕಾಶಕರು ಪ್ರಸಂ ಬುಕ್ ಪ್ರೆವೇಟ್ ಲಿಮಿಟೆಡ್, ಬೆಂಗಳೂರು, 2009.
4. ಎ.ಪಿ.ಜೆ ಅಬ್ದುಲ್ ಕಲಾಂ,(ಅನುವಾದ: ಜಿ.ಕೆ. ಮಧ್ಯಸ್ಥ),ನನ್ನ ಪಯಣ,ವಸಂತ ಪ್ರಕಾಶನ,ಬೆಂಗಳೂರು,2013.

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BHNT22	Language: Hindi – II	CC	3	0	0	3	3

अध्ययन विषय सूची / पाठ्यक्रम

इकाई – 1: प्राचीन कविता, आधुनिक कविता 16 Hrs

1. कबीर के दोहे
2. कविता – जलियाँवाला बाग में बसंत- सुभद्राकुमारी चौहान
3. कविता – सुभाष की मृत्यु पर - धर्मवीर भारती

इकाई – 2: मध्यकालीन कविता, आधुनिक कविता 16 Hrs

4. रसखान के दोहे
5. कविता – हमारी जिन्दगी - केदारनाथ अग्रवाल
6. कविता – चलना हमारा काम है।- शिवमंगल सिंह सुमन

इकाई – 3: मध्यकालीन कविता, आधुनिक कविता 16 Hrs

7. मीराबाई के पद
8. कविता – मेरे सपने बहुत नहीं हैं- गिरिराज कुमार माथुर
9. कविता – अभी न होगा मेरा अंत – निराला

सन्दर्भ ग्रन्थ :

- पाठ्य पुस्तक – रेवा विश्वविद्यालय
- सुबोध व्यवहारिक हिन्दी – डॉ. कुलदीप गुप्त
- अभिनव व्यवहारिक हिन्दी – डॉ. परमानन्द गुप्त
- हिन्दी साहित्य का इतिहास - डॉ. नागेन्द्र
- आधुनिक हिन्दी साहित्य का इतिहास - डॉ. बच्चन सिंह
- हिन्दी साहित्य का नवीन इतिहास - डॉ. लाल साहब सिंह
- शुद्ध हिन्दी कैसे बोले कैसे लिखे- पृथ्वीनाथ पाण्डे
- कार्यालय अनुवाद निदेशिका

हिन्दी निबंध संग्रह

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BENT23	Language: English – II	CC	3	0	0	3	3

Course Objectives:

- To help the student understand the multiple values of the society.
- To develop a cultural understanding in the student to sharpen his/her social skills.
- To ensure a gradual development of literary interest in the student.

Course Outcomes:

On completion of the course, learners will be able to:

- Demonstrate a deep understanding of the society and its values.
- Develop a constructive understanding of the cultural dimensions of the human world.
- Make use of his understanding to become a responsible global citizen of tomorrow.

Unit – I : Prose

16 Hrs

Literature: The Necklace - Guy de Maupassant, Of Studies - Francis Bacon.

Unit – II: Poetry

16 Hrs

Literature: A Summer Poem - Jayanta Mahapatra, The Bus - Arun Kolatkar, Poet, Lover, Birdwatcher - Nissim Ezekiel.

Unit – III: Play

16 Hrs

Literature: Final Solutions - Mahesh Dattani.

Reference Books:

1. Agrawal, K.A. *Toru Dutt the Pioneer Spirit of Indian English Poetry - A Critical Study*. Atlantic Publications, 2009.
2. Latham, Edward Connery (ed). *The Poetry of Robert Frost*. Holt Paperbacks, 2002.
3. Gale, Cengage Learning. *A Study Guide for Tomas Rivera's The Harvest*. Gale, Study Guides, 2017.
4. Basu, Tejan Kumar. *The Life and Times of C.V. Raman*. PrabhatPrakashan, 2016.
5. Rozewicz, Tadeusz. *New Poems*. Archipelago, 2007.
6. Manohar, Murli. *Critical Essays on Dalit Literature*. Atlantic Publishers, 2013.
7. Hansda, SowvendraShekhar. *The Adivasi Will Not Dance: Stories*. Speaking Tiger Publishing Private Limited, 2017.
8. Jacobs, Harriet. *Incidents in the Life of a Slave Girl*. Createspace Independent Publication, 2014.
9. Das, Kamala. *Selected Poems*. Penguin Books India, 2014.
10. Tagore, Rabindranath. *Selected Short Stories of Rabindranath Tagore*. Maple Press, 2012.
11. Gale, Cengage Learning. *A Study Guide for Jamaica Kincaid's Girl*. Gale, Study Guides, 2017.
12. Kipling, Rudyard. *The Absent-Minded Beggar*. Hardpress Publishing, 2013.
13. Doyle, Arthur Conan. *The Hound of the Baskervilles*. General Press, 2017.
14. Dixon, Robert J. *Everyday Dialogues in English*. Prentice Hall India Pvt Ltd., 1988.
15. Turton, Nigel D. *ABC of Common Errors*. Mac Millan Publishers, 1995.
16. Samson, T. (ed.) *Innovate with English*. Cambridge University Press, 2010. Kumar, E Suresh, J. Savitri and P Sreehari (ed). *Effective English*. Pearson Education, 2009.

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BENT24	Functional English - II	CC	3	0	0	3	3

Course Objectives

- To utilize the ability of using language skills effectively in real-life scenarios.
- To develop the learners' competence in employability skills.
- To improve the habit of writing, leading to effective and efficient communication.
- To prioritize specially on the development of technical reading and speaking skills among the learners.

Course Outcomes

On completion of the course, learners will be able to:

- Organize their opinions clearly and meaningfully.
- Demonstrate the ability to speak appropriately in social and professional contexts.
- Build inferences from the text.
- Take part in interviews confidently.
- Develop accurate writing skills using different components of academic writing.

Unit – I

16 Hrs

Reading Skill

1. Note taking and Note making
2. Report writing
3. Comprehension

Unit – II

16 Hrs

Writing Skill

1. Resume Writing
2. Apology Letter
3. Letter of Enquiry
4. Reply letter

Unit – III

16 Hrs

Poetry

1. Let me not to the marriage of true minds - William Shakespeare
2. She dwelt among the untrodden ways - William Wordsworth
3. Mending Wall - Robert Frost

Unit – IV

Play

1. Macbeth - William Shakespeare

Reference Books:

1. Bansal, R.K. and J.B. Harrison. *Spoken English*. Orient Blackswan, 2013.
2. Raman, Meenakshi and Sangeeta Sharma. *Technical Communication*. Oxford University Press, 2015.
3. Thorpe, Edgar and Showick Thorpe. *Objective English*. Pearson Education, 2013.
4. Dixon, Robert J. *Everyday Dialogues in English*. Prentice Hall India Pvt Ltd., 1988.
5. Turton, Nigel D. *ABC of Common Errors*. Mac Millan Publishers, 1995.
6. Samson, T. (ed.) *Innovate with English*. Cambridge University Press, 2010.
7. Kumar, E Suresh, J. Savitri and P Sreehari (ed). *Effective English*. Pearson Education, 2009.

8. Goodale, Malcolm. *Professional Presentation*. Cambridge University Press, 2013.

Course code	Course title	Course type	L	T	P	C	Hrs/Week
24BCST25	Computer Science- IV	HC	3	0	0	3	3

Course objectives

1. To understand the principles of Object-Oriented Programming (OOP) and its advantages over procedural programming.
2. To learn the syntax and semantics of the C++ programming language.
3. To develop problem-solving skills using OOP concepts.
4. To implement real-world applications using C++.

Course Outcomes

By the end of this course, students will be able to:

1. Understand and apply the fundamental concepts of OOP.
2. Write, compile, and debug C++ programs.
3. Use classes and objects to model real-world problems.
4. Implement inheritance, polymorphism, and other OOP features in C++.

Unit 1: Introduction to Object-Oriented Programming

- **Overview of OOP:** Principles of OOP, Benefits of OOP, Applications of OOP.
- **Basic Concepts:** Objects, Classes, Data Abstraction, Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing.
- **C++ Basics:** Structure of a C++ Program, Data Types, Variables, Constants, Operators, Control Structures.

Unit 2: Classes and Objects

- **Defining Classes:** Class Declaration, Member Functions, Creating Objects.
- **Constructors and Destructors:** Types of Constructors, Destructor.
- **Member Functions:** Inline Functions, Friend Functions, Static Members.
- **Overloading:** Function Overloading, Operator Overloading.

Unit 3: Inheritance and Polymorphism

- **Inheritance:** Types of Inheritance, Base and Derived Classes, Access Specifiers, Constructors in Derived Classes.
- **Polymorphism:** Pointers to Objects, Virtual Functions, Pure Virtual Functions, Abstract Classes.
- **Type Conversion:** Basic to Class Type, Class to Basic Type, One Class to Another Class.

Unit 4: Advanced Topics

- **Templates:** Function Templates, Class Templates.
- **Exception Handling:** Basics of Exception Handling, Try, Catch, and Throw.
- **File Handling:** File Streams, File Operations, Reading and Writing Files.

Reference:

1. "Object-Oriented Programming with C++" by E. Balagurusamy
2. "Programming with C++" by John R. Hubbard

3. "Object-Oriented Programming Using C++" by Anuradha A. Puntambekar

Course code	Course title	Course type	L	T	P	C	Hrs/Week
24BCSP21	Computer Science Practical_IV (C++ programming lab)	HC	0	0	3	2	3

Course Objectives:

1. Understand the concept of using C++.
2. Perform the use of inheritance and polymorphism..
3. Perform the use of file handling concepts.

Course Outcomes (COs):

1. Understand the use of classes and objects.
2. Perform the construct types of constructors and inheritance
3. using of file handling and pointers.

Practicals contents:

1. Write a program to find the frequency of presence an elemnt in an array.
2. Write a program to insert an element into an array into given position.
3. Write a program to delete an element from an array from a given position.
4. Write a program to create a class with data members principal, time and rate. Create member functions to accept data values to compute Simple Interest and display the result.
5. Program to find the area of a square/rectangle using function overloading.
6. Program to find the cube of number using inline function.
7. Program to create a class of data members and function members using parameteried constructors.
8. Program to illustrate single level inheritance using data members roll no, name and display results.
9. Create a class containing the following data members reg no, name and fees. Also create a member functions to read and display the data using the concept of pointers to objects.
10. Write a program to display two variables using friend function.

Course code	Course title	Course type	L	T	P	C	Hrs/Week
24BCST26	Computer Science-V (Data structures)	HC	3	0	0	3	3

Course objectives:

1. Understand the basis of data structure ,classifications and importance of data structures.
2. Understand the concept of Stack and memory representation of stack and PUSH and POP algorithm
3. Understand the concept of queues and its operations.
4. Understand the concept of tree, binary tree operations, searching, sorting techniques.

Course Outcomes

On successful completion of this course, students will be able to:

1. Understand the basics of data structure.
2. Identify the appropriate data structures and algorithm like stack, queue operation , tree operations and searching and sorting techniques.

Unit 1

Introduction: Data structure definition,basic terminology and concepts, importance of data structures,classifica-
tion: primitive and non primitive data structures.

Stack: Definition, memory representation, algorithm for stack operation (PUSH and POP), applications.

Unit 2

Queue: definition, memory representation, linear queue, circular queue ,enqueue, dequeue , applications
Linked list: definition, types(singly LL, doubly LL, circular LL), application.

Unit 3

Tree: definition, memory representation using arrays and linked list.

Binary tree: defination, traversal algorithm, insertion and deletion of a node.

Unit 4

Sorting techniques: Bubble sort, insertion sort algorithm

Searching : linear and binary search algorithm

Course code	Course title	Course type	L	T	P	C	Hrs/Week
24BCSP22	Computer Science Practical-V (Data structures using C++)	HC	0	0	3	2	3

Course objectives

4. Understand the concept of data structure using C++.
5. Construct binary tree and linear queue operations.
6. Perform the insert and delete of node in a singly linked list.

Course Outcomes

On successful completion of this course, students will be able to:

1. Implement data structure using C++
2. Demonstrate searching and sorting techniques using C++
3. Demonstrate simple programming skills through C++ programming language.

Practical contents

1. Program to find GCD of two numbers
2. Program to print Fibonacci series.
3. Program to perform stack operation
4. Program to perform linear queue operation
5. Program to perform sort an array
6. Program to perform linear search of an element
7. Program to perform binary search of an element
8. Program to construct a binary search tree
9. Program to insert a node at the beginning of a single linked list
10. Program to delete a node at the end of a single linked list.

Course code	Course title	Course type	L	T	P	C	Hrs/Week
24BCST27	Computer Science-VI (Python Programming)	HC	3	0	0	3	3

Course objectives

1. Understand the basic concept of python programming language.
2. Understand the data types and flow of control using selection and repetition statements.
3. String handling and tuple handling

Course Outcomes

1. Complete overview of python using data types and functions.
2. Illustrate the use of built in functions and traversal of a list and string

Unit 1

Introduction: definition, features of python, working with python, execution modes: interactive mode and script mode

Basic concepts of python: keywords, identifiers, variables, comments, operators, input and output statement, type conversion

Unit 2

Data types : definition and example (numbers, sequences, sets, none, mapping, strings, lists, tuples, dictionaries.)

Debugging: types of errors, syntax errors, runtime errors and logical errors.

Unit 3

Flow of control: selection statements (if, if else, switch), repetition (while, do while, for)

Functions: advantages, creating user defined functions, parameter and arguments

Unit 4

String : operations, traversing a string, built in functions, handling strings.

Lists: operations, traversing a list, list manipulation

Tuples: operations, built in functions, tuple handling.

Course code	Course title	Course type	L	T	P	C	Hrs/Week
24BCSP23	Computer Science Practical-VI (Getting started with python)	HC	0	0	3	2	3

Course objectives

1. Execution of python using interactive and script mode.
2. Implement of arithmetic operations and user defined functions .

Course Outcomes

1. Confidently on working of python on both the execution modes.
2. Design of patters and user defined functions

Practical

1. Write a program to swap two numbers using a third variable.
2. Write a program to enter two integers and perform all arithmetic operations on them.
3. Write a program to find largest among three numbers.
4. Write a function to print the table of a given number. The number had to be entered by the user.
5. Write a program to print the following patterns


```

1 2 3 4 5

1 2 3 4

1 2 3

1 2

1

```
6. Write a program to calculate the amount payable if money has been lent on simple interest, principal or money lent = P rate = R per annum and time = T years, then simple interest (SI) = $(P \times R \times T) / 100$ amount = principal + SI p,r,t are given as input to the program
7. Write a program that user defined functions that accept name and gender(as M for male, F for female) and prefixes Mr/Ms on the basis of the gender.
8. Write a program to check whether an input number is a palindrome or not
9. Write a program to find the sum of digits of using an integer number.
10. Write a program to find the number of times and element occurs.

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BPET28	Astrophysics	OE	2	0	0	2	2

Course Objectives:

To study Concepts of Ancient Astronomy Indian Astronomy, vedic astronomy, Planets, Stars Galaxies, Asteroids, Meteors, Comets, Experimental tools for Astronomy and Space Science, Fundamental Particles and basic forces.

Course Objectives:

On completion of the course students will be able to:

1. Acquire knowledge about Ancient Astronomy, Indian Astronomy, and Vedic astronomy.
2. Acquire knowledge about Planets, and Stars, Galaxies, Asteroids, Meteors, Comets.
3. Understand the Experimental tools for Astronomy and Space Science and Fundamental Particles and basic forces.
4. Understand and learn the basic concepts of astrophysics and basic forces.

UNIT-I

12 hours

Ancient Astronomy, Greek observations, sumerian observations, mayan observations, Arabic observations , chinese observations, Indian Astronomy, vedic astronomy, ancient astronomy – Aryabhata, Varahamihira, Bhaskara, Astronomy in Indian Scriptures, Medieval & Modern Astronomy, Invention of Telescopes, Models of the Solar System & Universe, Observations by Tycho Brahe, Kepler, Galileo, Herschel and other, Optical tools for Astronomy, Pin Hole, Binoculars, Telescopes & Imaging. Observational Terminologies, Cardinal Directions, Azimuth, Altitude, Measurements using Compass and, Hand. Equatorial Co-ordinates, Light years, magnitude, colors etc.

UNIT-II

12 hours

Planets: Formation of Solar System - planet types, atmospheres and magnetic fields of planets and their moons

Stars: Measuring stellar characteristics (temperature, distance, luminosity, mass, size) - HR diagram - stellar structure (equilibrium, nuclear reactions, energy transport) - stellar evolution.

Galaxies: Our Milky Way - Galactic structure - Galactic rotation - Galaxy types - Galaxy formation.

Asteroids: Discovery and designation, Origin, Nature and Orbits of Asteroids.

Meteors: Meteor showers and sporadic meteors.

Comets: Periodic comets, brightness variation in comets.

UNIT-III

12 hours

Observational and Experimental tools for Astronomy and Space Science: In-situ measurements of chemical, physical and dynamical parameters using Kites, Balloons, Aeroplanes, Rockets and Satellite Payloads.

Fundamental Particles and basic forces: Protons, Electrons, Neutrons, Neutrinos, Mesons, leptons, and quarks. The concept of Basic forces viz., strong, weak, electromagnetic and gravitational forces.

Reference Book

1. BW Carroll & DA Ostlie, An Introduction to Modern Astrophysics, Latest Edition, Addison-Wesley.
2. Frank Shu, The Physical Universe, Latest Edition, University Science Books
3. Martin Harwit, Astrophysical Concepts, Latest Edition, Springer.
4. T. Padmanabhan, Invitation to Astrophysics, Latest Edition, World Scientific Publishing Co.
5. T. Padmanabhan, Theoretical Astrophysics vols 1-3, Latest Edition, Cambridge University Press.
6. Astronomy structure of the Universe. A.E. Roy and D. Clarke, Adam Hilger Pub.
7. Source Book of Space Sciences, Samuel Galsstone; D.VanNostrand Co. Inc.
8. Research in Geophysics:Vol.1- Sun, Upper Atmosphere and space edited by Hugh Odishaw, National Academy of Sciences. Washington D.C.
9. Source book on the Space Sciences - Samuel Glasstone, Princeton, New Jersey.
10. The Upper Atmosphere - S K Mitra.

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BCET29	General Chemistry	OE	2	0	0	2	2

UNIT I

12hrs

Inorganic Chemistry

General introduction, electronic configuration, general trends in physical (atomic radii, ionization energy, enthalpy, electron affinity and electronegativity) and chemical properties of elements (reaction with water, oxygen and halogens). Anomalous properties of the first element of each group and diagonal relationship. Bohr's theory, its limitations and atomic spectrum of hydrogen atom. Wave mechanics: de Broglie equation, Heisenberg's Uncertainty Principle and its significance. Quantum numbers and their significance. Shapes of s, p, d and f orbitals. Contour boundary and probability diagrams. Pauli's Exclusion Principle, Hund's rule of maximum multiplicity, Aufbau's principle and its limitations- Electronic configurations of the elements (Z=1-30), effective nuclear charge, shielding/screening effect, Slater's rules Problems. Variation of effective nuclear charge in Periodic Table

UNIT II

12hrs

ORGANIC CHEMISTRY

Introduction

Organic compounds: General classification and nomenclature (in brief), hybridization, structure and shapes of ethane, ethene and ethyne. Bond cleavage Homolysis and heterolysis with examples. Electrophilic and nucleophilic reagents with examples.

Electronic effects

Inductive effect– definition, +I and –I effect with suitable examples. Resonance effect– definition, +R and –R effect with suitable examples. Electromeric effect–definition with examples. Hyperconjugation– definition, explanation for the stability of carbocations and alkenes by Hyperconjugation .

Strength of organic acids and bases

Comparative study with emphasis on inductive effect affecting pKa values (Examples: Comparison of acetic acid, mono, di and trichloro acetic acids; fluoro, chloro, bromo and iodo acetic acids; 2–chloro and 3-chloropropanoic acids). Basicity of amines Comparative study with emphasis on inductive and resonance effects affecting pKb values (Examples: Comparison of basicity of methyl amine, ammonia: methyl amine, dimethyl amine, tri methyl amine, and aniline, ammonia). Aromaticity–conditions for aromaticity, Huckel's rule (examples: cyclopentadienyl anion and benzenoids), aromaticity of pyrrole and pyridine.

UNIT III

12hrs

PHYSICAL CHEMISTRY

PHASE EQUILIBRIA: Terminology – phase, components, degree of freedom. Gibb's phase rule, derivation of phase rule. One componentsystem – water, sulphur and carbon dioxide, two component system -simple eutectic system, thermal analysis of cooling curves, lead-silversystem, bismuth-cadmium. Freezing mixture: acetone-dry ice. Two component system with compound formation.

SURFACE CHEMISTRY: Types of adsorption, characteristics of physisorption and chemisorption, adsorption isotherms and its types, Freundlich and derivation and treatment of Langmuir isotherms – Unimolecular and bimolecular reactions applications of adsorption.

Recommended Books/References:

1. Concise Inorganic Chemistry, J. D. Lee, Wiley, 5th edition (2008).
2. Concepts and Models of Inorganic Chemistry, B. E. Douglas, D.H. McDaniel, J.J. Alexander John Wiley and Sons, 3rd edition (1999).
3. Atkin's Physical Chemistry, P.W. Atkins, J. De Paula, Oxford University Press, 6th edition (2014).
4. Inorganic and Solid State Chemistry, G.E. Rodger, Cengage Learning, 3rd edition (2011).
5. 1. Bahl, A. & Bahl, B.S. Advanced Physical Chemistry, S. Chand, 2010.
6. 2. J. N. Gurtu and Aayushi Gurtu, Undergraduate Physical Chemistry, Vol I, Vol II and Vol III
7. Pragati Prakashan.
8. 3. Barrow, G.M. Physical Chemistry Tata McGraw-Hill (2007).
9. 4. Castellan, G.W. Physical Chemistry 4th Ed. Narosa (2004).
10. 5. Kotz, J.C., Treichel, P.M. & Townsend, J.R. General Chemistry Cengage Learning India Pvt.
11. Ltd., New Delhi (2009).
12. 6. Mahan, B.H. University Chemistry 3rd Ed. Narosa (1998).
13. 7. Petrucci, R.H. General Chemistry 5th Ed. Macmillan Publishing Co.: New York (1985).

Course Code	Course Title	Course Type	L	T	P	C	Hrs/Week
24BMET20	OPTIONAL MATHEMATICS-II	OE	2	0	0	2	2

Course Objectives:

To study Concepts of divisibility, prime and composite numbers and understanding the concept of differentiation and theorems using various rules.

Course Learning Outcomes: This course will enable the students to

1. Learn the concept of Divisibility.
2. Learn about prime and composite numbers.
3. Learn the concept of congruences and its applications.
4. Understand the concept of differentiation and fundamental theorems in differentiation and various rules.
5. Find the extreme values of functions of two variables.
6. To understand the concepts of multiple integrals and their applications.

Unit-I: Number Theory:

12 hours

Division Algorithm, Divisibility, Prime and composite numbers, Euclidean algorithm, Fundamental theorem of Arithmetic, The greatest common divisor and least common multiple. Congruences, Linear congruences, Simultaneous congruences, Euler's Phi-function, Wilson's, Euler's and Fermat's Theorems.

Unit-II: Partial Derivatives:

12 hours

Functions of two or more variables-explicit and implicit functions, partial derivatives. Homogeneous functions- Euler's theorem and extension of Euler's theorem, total derivatives, differentiation of implicit and composite functions, Jacobians and standard properties and illustrative examples.

Unit-III: Integral Calculus:

12 hours

Line integral: Definition of line integral and basic properties, examples on evaluation of line integrals. Double integral: Definition of Double integrals and its conversion to iterated integrals. Evaluation of double integrals by changing the order of integration and change of variables. Triple integral: Definition of triple integrals and evaluation-change of variables.

Reference Books:

1. Differential Calculus, Shanti Narayan, S. Chand & Company, New Delhi.
2. Applications of Calculus, Debasish Sengupta, Books and Allied (P) Ltd., 2019.
3. Calculus – Lipman Bers, Holt, Rinehart & Winston.
4. Calculus - Shanthinarayanan & T. K. Manicavachogam Pillay, S. Viswanathan Pvt. Ltd., vol. I & II.
5. Schaum's Outline of Calculus - Frank Ayres and Elliott Mendelson, 5th ed. USA:Mc. Graw Hill,

2008.

6. Integral Calculus, Shanthinarayan, S. Chand and Co. Pvt. Ltd.
7. Integral Calculus, Shantinarayan and P K Mittal, S. Chand and Co. Pvt. Ltd.
8. Text Book of B.Sc. Mathematics, G K Ranganath, S Chand & Company.
9. David M Burton, Elementary Number Theory, 6th edition, McCraw Hill, 2007.
10. Emil Grosswald, Topics from the Theory of Numbers, Modern Birhauser, 1984.
11. Ivan Niven, Herbert S. Zuckerman and Hugh L. Montgomery, An Introduction to the Theory of Numbers, John Willey (New York), 1991.

SCHEME OF VALUATION (Theory)

Evaluation of Internal Assessment Marks*

	IA1 Marks	IA2 Marks	Total
Test	10	10	20
Assignment/Report	10	10	20
Total	20	20	40

QUESTION PAPER PATTERN for SEMESTER EXAMINATION

Duration: 3 hrs		Max. Marks: 60	
PART-A: Answer any six of the following			6 X 2 = 12
1			
2			
3			
4			
5			
6			
7			
PART-B: Answer any three of the following			3 X 6 = 18
1			
2			
3			
4			
PART-C: Answer any three of the following			3 X 10 = 30
1			
2			
3			
4			

I & II SEMESTER: SCHEME OF VALUATION (PRACTICALS)

Internal Assessment Marks = 20

	C1 Marks	C2 Marks	Total Marks
Test	10	10	20

Practical Semester End Examination (C3) = 30 Marks

Duration: 03 Hrs

Note: Duly certified practical record shall be submitted at the practical examination (No evaluation of record).

QUESTION PAPER PATTERN for OE/FC Subjects

Duration: 2h.		Max. Marks: 30	
Instructions:			
PART-A		Answer any five of the following	5 X 1 = 05
1	a)	(Two questions from each unit)	
	b)		
	c)		
	d)		
	e)		
	f)		
PART-B:			
Answer any two of the following			5 X 5 = 25
2	a)		
	b)		
3	a)		
	b)		
4	a)		
	b)		
5	a)		
	b)		
6	a)		
	b)		
7	a)		
	b)		
The sub-questions shall be of (5) or (3+2)			