**BACHELOR OF COMPUTER APPLICATIONS**
**(For Students admitted from academic year 2022 - 2023 onwards)**
**CURRICULUM**

| **SEMESTER I** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Career Stream Title** | **Course Code** | **Course Title** | **L** | **T** | **P** | **L+T +P** | **C** |
| Language | LATD 1911 | Tamil - I | 4 | 0 | 0 | 4 | 4 |
| | LAHD 1911 | Hindi – I | | | | | |
| | LAFD 1911 | French – I | | | | | |
| | LAED 1911 | English –I | 4 | 0 | 0 | 4 | 4 |
| Compulsory Core | BCAD2211 | Problem Solving Techniques | 4 | 1 | 0 | 5 | 5 |
| Compulsory Core Lab | BCAD 2212 | Problem Solving Techniques Laboratory | 0 | 0 | 4 | 4 | 2 |
| Allied | BCAD2213 | Mathematics – I | 4 | 1 | 0 | 5 | 5 |
| **Total** | | | **16** | **2** | **4** | **22** | **20** |
| **SEMESTER II** | | | | | | | |
| **Career Stream Title** | **Course Code** | **Course Title** | **L** | **T** | **P** | **L+T +P** | **C** |
| Language | LATD 1921 | Tamil - II | 4 | 0 | 0 | 4 | 4 |
| | LAHD 1921 | Hindi – II | | | | | |
| | LAFD 1921 | French –II | | | | | |
| | LAED 1921 | English –II | 4 | 0 | 0 | 4 | 4 |
| Compulso | BCAD | Web Technology | 4 | 1 | 0 | 5 | 5 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ry Core | 2221 | | | | | | |
| Compulsory Core Lab | BCAD 2222 | Web Technology Laboratory | 0 | 0 | 4 | 4 | 2 |
| Allied | BCAD2223 | Mathematics – II | 4 | 1 | 0 | 5 | 5 |
| **Total** | | | **16** | **2** | **4** | **22** | **20** |

| SEMESTER III | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Career Stream Title** | **Course Code** | **Course Title** | **L** | **T** | **P** | **L+T +P** | **C** |
| Compulsory Core | BCAD 2231 | Programming In Java | 4 | 1 | 0 | 5 | 5 |
| | BCAD 2232 | Relational Database Management | 4 | 1 | 0 | 5 | 5 |
| Compulsory Core Lab | BCAD 2233 | Programming In Java Laboratory | 0 | 0 | 4 | 4 | 2 |
| | BCAD 2234 | Relational Database Management Laboratory | 0 | 0 | 4 | 4 | 2 |
| Skill Based | BCAD 2235 | Fundamentals of Data structures and Algorithms | 4 | 0 | 0 | 4 | 4 |
| **Total** | | | **12** | **2** | **8** | **22** | **18** |

| SEMESTER IV | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Career Stream Title** | **Course Code** | **Course Title** | **L** | **T** | **P** | **L+T +P** | **C** |
| Compulsory Core | BCAD 2241 | Multimedia and Animation | 4 | 1 | 0 | 5 | 5 |
| | BCAD 2242 | Windows Programming Using VB .Net | 4 | 1 | 0 | 5 | 5 |
| Compulsory Core Lab | BCAD 2243 | Multimedia and Animation Laboratory | 0 | 0 | 4 | 4 | 2 |
| | BCAD 2244 | Windows Programming Using VB .Net Laboratory | 0 | 0 | 4 | 4 | 2 |
| Skill Based | BCAD 2245 | Introduction to Python | 2 | 0 | 4 | 6 | 4 |
| **Total** | | | **10** | **2** | **12** | **24** | **18** |

| SEMESTER V | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Career Stream Title** | **Course Code** | **Course Title** | **L** | **T** | **P** | **L+T +P** | **C** |
| Compulsory Core | BCAD 2251 | Software Engineering and Testing | 4 | 0 | 0 | 4 | 4 |
| | BCAD 2252 | PHP and MYSQL Programming | 4 | 0 | 0 | 4 | 4 |
| | BCAD 2253 | Operating System | 4 | 1 | 0 | 5 | 5 |
| Compulsory Core Lab | BCAD 2254 | PHP and MYSQL Programming Laboratory | 0 | 0 | 4 | 4 | 2 |
| **Student Must Select any one of the following Elective Courses** | | | | | | | |
| Skill Based Elective | BCAD 2255 | Introduction to R Programming | **0** | 2 | 2 | 4 | 3 |
| | BCAD 2256 | Cloud Computing | | | | | |
| **Total** | | | **12** | **3** | **6** | **21** | **18** |
| **SEMESTER VI** | | | | | | | |
| **Career Stream Title** | **Course Code** | **Course Title** | **L** | **T** | **P** | **L+T+ P** | **C** |
| Compulsory Core | BCAD 2261 | Object Oriented Analysis And Design | 4 | 0 | 0 | 4 | 4 |
| | BCAD 2262 | Computer Networks | 4 | 0 | 0 | 4 | 4 |
| Compulsory Core Lab | BCAD 2263 | Object Oriented Analysis and Design Laboratory | 0 | 0 | 4 | 4 | 2 |
| | **BCPD 2264** | Project Work | 0 | 2 | 8 | 10 | 6 |
| **Total** | | | **8** | **2** | **12** | **22** | **16** |

**Total Credits to be earned for the degree: 110**

**UNDER GRADUATE PROGRAMMES REGULATIONS 2019**

**(For students admitted from the academic year 2022-23 onwards)**

## R.2.0 ELIGIBILITY AND DURATION

| Programmes | Eligibility | Credits | Duration | Maximum uration |
|---|---|---|---|---|
| **BACHELOR OF COMPUTER APPLICATIONS** | **10, +2 ( HSC) -Any Group or equivalent (or) 10+3 year Diploma** | **108** | **3 Years** | **5 Years** |

**Program Educational Objectives (PEOs)**

- PEO1. Graduates will have skills and knowledge to excel in their professional career in Computer Applications and related disciplines
- PEO2. Graduates will contribute and communicate effectively within the team to grow into leaders
- PEO3. Graduates will practice lifelong learning for continuing professional development
- PEO4. Graduates will have the capability to continue their formal education and successfully complete an advanced degree
- PEO5.Graduates will contribute to the growth of the nation and society by applying acquired knowledge in technical, computing and managerial skills.

**Student outcomes (SOs)**

The curriculum and syllabus for Bachelor degrees (2022) conform to outcome based teaching learning process. In general, TWE:VE STUDENT OUTCOMES (a-k) have been identified and the curriculum and syllabus have been structured in such a way that each of the courses meets one or more of these outcomes. Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire as they progress through the

program. Further each course in the program spells out clear instructional objectives which are mapped to the student outcomes.

a. An ability to apply knowledge of computing, mathematics, and basic sciences appropriate to the discipline

b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution

c. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs

d. An ability to function effectively on teams to accomplish a common goal

e. An understanding of professional, ethical, legal, security and social issues and responsibilities

f. An ability to communicate effectively with a range of audiences

g. An ability to analyze the local and global impact of computing on individuals, organizations, and society

h. Recognition of the need for and an ability to engage in continuing professional development

i. An ability to use current techniques, skills, and tools necessary for computing practice.

j. An ability to use and apply current technical concepts and practices in the core information technologies

k. An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation, and administration of computer-based systems

l. An ability to effectively integrate IT-based solutions into the user environment

m. An understanding of best practices and standards and their application

n. An ability to assist in the creation of an effective project plan.

## FIRST SEMESTER

| குறியீட்டு எண் | பாடம் | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **LATD 1911** | தமிழ் – I | **4** | **0** | **0** | **4** | **4** |

| **INSTRUCTIONAL OBJECTIVES** At the end of this course the learner is expected: | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| **1.** | இரண்டாயிரம் ஆண்டுகாலத் தமிழின் தொன்மையையும் வரலாற்றையும் அதன் விழுமியங்களையும் பண்பாட்டையும் எடுத்துரைப்பதாக இப்பாடத்திட்டம் அமைக்கப் பட்டுள்ளது. | **e** | **f** | **h** | **m** | **n** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **2.** | காலந்தோறும் தமிழ் இலக்கியம் உள்ளடக்கத்திலும், வடிவத்திலும் பெற்ற மாற்றங்கள், அதன் சிந்தனைகள், அடையாளங்கள் ஆகியவற்றை காலந்தோறும் எழுதப்பட்ட இலக்கியங்களின் வழியாகக் கூறுவதாகவும், மொழியின் கட்டமைப்பைப் புரிந்து கொள்வதாகவும் பாடத்திட்டம் வடிவமைக்கப்பட்டுள்ளது. | **e** | **f** | **h** | **n** | |
| **3.** | வாழ்வியல் சிந்தனைகள், ஒழுக்கவியல் கோட்பாடுகள், சமத்துவம், சூழலியல் எனப் பல கூறுகளை மாணவர்களுக்கு எடுத்துரைக்கும் விதத்தில் இப்பாடத்திட்டம் உருவாக்கப்பட்டுள்ளது. | **e** | **f** | **d** | **n** | |

**அலகு – 1**

**இக்காலக் கவிதைகள் - 1**

1. பாரதியார் – கண்ணன் என் சேவகன்
2. பாரதிதாசன் – தமிழ்ப்பேறு
3. அப்துல் ரகுமான் – அவதாரம்
4. மீரா – கனவுகள் +கற்பனைகள் = காகிதங்கள்
5. து. நரசிம்மன் – மன்னித்துவிடு மகனே

**அலகு – 2**

**இக்காலக் கவிதைகள் - 2**

1. ராஜா சந்திரசேகர் – கைவிடப்பட்ட குழந்தை
2. அனார் – மேலும் சில இரத்தக் குறிப்புகள்
3. சுகிர்தராணி – அம்மா
4. நா.முத்துக்குமார் – தூர்

**அலகு – 3**

**சிற்றிலக்கியம்**

1. கலிங்கத்துப் பரணி – பொருதடக்கை வாள் எங்கே… ( பாடல் - 485)
2. அழகர்கிள்ளை விடு தூது – இதமாய் மனிதருடனே… (கண்ணி – 45)
3. நந்திக் கலம்பகம் – அம்பொன்று வில்லொடிதல்… ( பாடல் – 77)
4. முக்கூடற் பள்ளு – பாயும் மருதஞ் செழிக்கவே… (பாடல் – 47)
5. குற்றாலக் குறவஞ்சி – ஓடக் காண்பதுமே… (பாடல் - 9)

**காப்பியங்கள்**

மணிமேகலை – உலகவறவி புக்க காதை – “மாசுஇல் வால்ஒளி! - இந்நாள் போலும் இளங்கொடி கெடுத்தனை” . (28 அடிகள்)

**அலகு – 4 – தமிழ் இலக்கிய வரலாறு**

1) சிற்றிலக்கியம் - தோற்றமும் வளர்ச்சியும், 2) புதுக்கவிதை - தோற்றமும் வளர்ச்சியும், 3) சிறுகதை - தோற்றமும் வளர்ச்சியும், 4) புதினம் - தோற்றமும் வளர்ச்சியும், 5) உரைநடை - தோற்றமும் வளர்ச்சியும்

**அலகு -5**

**மொழிப்பயிற்சி :**

1. கலைச்சொல்லாக்கம், 2. அகரவரிசைப்படுத்துதல், 3. மரபுத்தொடர் / பழமொழி, 4. கலை விமர்சனம், 5. நேர்காணல்

**உரைநடைப் பகுதி :**

1. உ.வே.சாமிநாதையர் – சிவதருமோத்திரச் சுவடி பெற்ற வரலாறு,
2. தஞ்சாவூர்க் கவிராயர் –கூஜாவின் கோபம்,
3. இரா.பச்சியப்பன் – மாடல்ல மற்றையவை

***பார்வை நூல்கள்***


1. *கைலாபதி, க., தமிழ் நாவல் இலக்கியம் ,குமரன் பதிப்பகம், வடபழனி. 1968.*
2. *சுந்தரராஜன், பெ .கோ., சிவபாதசுந்தரம், சோ., தமிழில் சிறுகதை வரலாறும் வளர்ச்சியும், க்ரியா, சென்னை, 1989.*
3. *பரந்தாமனார், அ.கி., நல்ல தமிழ் எழுத வேண்டுமா, பாரி நிலையம், சென்னை, 1998,*
4. *பாக்யமேரி, வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு, என்.சி.பி. எச். பதிப்பகம், சென்னை, 2011*
5. *வல்லிக்கண்ணன், புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும், அன்னம், சிவகங்கை, 1992.*


| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| LAHD 1911 | HINDI – I | 4 | 0 | 0 | 4 | 4 |

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| 1. | To express and communicate literature which is part of life | e | f | h | m | n |
| 2. | To incorporate day to day personal and professionl life's need to communicate in the language. | e | f | | | |
| 3. | To help the students to imagine and express their mind through literature | e | f | | | |

**UNIT I - PROSE**

1. Bade Ghar Ki Beti - Premchand
2. Vaishnav Ki Fislan (Vyangya Katha) - Harishankar Parsai
3. Benam Rishta - Mridula Garg
4. Utsah - Ramchandar Shukla (Niband)
5. Puruskar - Jayshankar Prasad
6. Hardam.Com - Alka Sinha

**UNIT II - ONE ACT PLAY**

1. Mahabharat Ki Ek Sanjh - Bharat Bhushan Agrawal
2. Reed Ki Haddi - Jagdish Chandr Mathur

**UNIT III - CORRESPONDENCE**

1. Official Letter
2. Demi-Official Letter

**UNIT IV - CINEMA**

1. Panchlight - Phanishwar Nath Renu
2. Chandi Ka Juta - Bal Shauri Reddi

**UNIT V - TECHNICAL TERMINOLOGY**

**REFERENCES**


1. Prayojan Mulak Hindi – Madhav Sontakke
2. A Practical Guide To English Translation And Compostition – K.P. Thakur


| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| LAFD 1911 | FRENCH-I | 4 | 0 | 0 | 4 | 4 |

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| 1. | To encourage greater written skills through comprehension writing and composition writing | e | f | h | m | n |
| 2. | Improve their oral and written skills through a combination of theory and practice. | e | f | | | |
| 3. | Extend and expand their savoir-faire through the acquisition of latest skills and techniques by practical training. | e | f | | | |

**Unité - I**

**Salut**-Saluer- Entrer en contact avec quelqu'un – se présenter – s'excuser- *tu* ou *vous* ? Les jours de la semaine – Quelques formules de politesse – L'alphabet – Quelques consignes de classe – Je, tu, vous, il. Elle – Etre – Quelques nationalités –Masculin et féminin –Les nombres de 0 à 10 – Quelques sigles.

**Unité - II**

**Enchanté**- Demander de se présenter – Présenter quelqu'un – La négation : ne…pas – Les adjectifs possessifs –Etre, avoir+quelques verbes en –er – C'est, il est – L'interrogation par l'intoSnation – Quelques professions – Les nombres de 11 à 69 – Oui, non, si. **J'adore !**- Exprimer ses gouts –échanger sur ses projet – Aller – Moi aussi – Nous, ils, elles – La conjugaisons des verbes en –er être et avoir – Faire du, de l', de la +sport – Les nombres après 69 – On=nous – Le futur proche – Quelques indicateurs de temps – Les adjectifs possessifs.

**Unité - III**

**Tu veux bien** – Demander à quelqu'un de faire quelque chose – Demander poliment – Parler d'actions passées –Il y a – Les articles définis et indéfinis – Les marques du pluriel des noms – Les pronoms

après une préposition (avec lui, chez, moi) – Le passé composé – Pouvoir, vouloir, venir, connaître.

**Unité - IV**

**On se voit quand ?** - Proposer, accepter, refuser une invitation – indiquer la date – Prendre et fixer un rendez-vous –Demandez et indiquer l'heure –Les pronoms compléments directs me, te, nous, vous –Pourquoi ? Parce que – Quel(s), Quelle(s) –L'interrogation avec est-ce que – Finir- Savoir – L'heure et la date – Les mois de l'année – Quelques indicateurs de temps

**Unité - V**

**Bonne idée !** – Exprimer son point de vue positif et négatif – s'informer sur le prix – S'informer sur la quantité – Exprimer la quantité – La négation : ne …pas de – Les articles partitifs – Combien ? –Un peu de, beaucoup de,…. –Qu'est-ce que, combien – offrir, croire – Penser à, penser de – Plaire à – Les couleurs – Le masculin et le féminin des adjectifs – Les pronoms compléments directs le, la, les.

**Référence**

1. **''Latitudes-1''** Méthode de français, REGIME MERIEUX, YVES LOISEAU Les éditions Didier, Paris, 2012.

| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| LAED 1911 | ENGLISH-I | 4 | 0 | 0 | 4 | 4 |

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | Student Outcomes | | | | |
|---|---|---|---|---|---|
| 1. To enable the students to think in English | e | f | h | m | n |
| 2. To become aware of the regional literature and the writers. | e | f | d | | |
| 3. To equip students with the awareness and strategies needed to enable the study of English as a lifelong process. | e | f | d | | |

**UNIT I - POETRY**

1. Yayum Nyayum – Kurunthogai 40
2. My Grandmother's House – Kamala Das
3. Transgender – Olivia Kent
4. Obituary – A K Ramanujam

**UNIT II - PROSE**

1. On Marriages – Nirad C Choudhary
2. Response to Welcome addresses ii)Why Do We Disagree– Swami Vivekananda
3. I have a dream – Martin Luther King

**UNIT III - SHORT STORY:**

1. A Nincompoop – Anton Chekhov
2. The Rat – Ashokamitran
3. Quantum of Solace – Ian Flemming
4. Squirrel - Ambai

**UNIT III - POPULAR LITERATURE**

1. Shabdo -Kaushik Ganguli
2. TEDX Talks
3. John Lennon - Imagine
4. Bob Marley - No woman no cry

**UNIT V - LANGUAGE COMPONENT**

1. Spot the Errors

2. Jumbled Sentence
3. Homophones & Homonyms
4. Idioms and Phrases
5. Antonyms and Synonyms
6. Story through Images
7. Hints Development
8. Autobiography of Concrete Objects
9. Advertisements
10. Slogan Writing

**TEXT BOOK**

1. Cambridge University Press, Raymond Murphy, Essential Grammar in Use 3rd Edition 2010

| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| BCAD 2211 | PROBLEM SOLVING TECHNIQUES | 4 | 1 | 0 | 5 | 5 |

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| 1. | To acquire knowledge about basic Programming skills | a | c | | | |
| 2. | To strengthen the knowledge on structures, arrays etc., of C programming | a | b | i | | |
| 3. | To develop program using the features in C Language for problem solving. | a | c | i | | |

**UNIT I - OVERVIEW OF C**

Introduction- Importance of C- Basic Structure of C program- Tokens- Variables- Data types- Operators and Expression- Managing Input and Output Operators.

**UNIT II - CONDITIONAL STATEMENTS**

If statement- switch statement- goto statement- while statement- do statement-for statement- continue statement- break statement.

**UNIT III - ARRAYS AND FUNCTIONS**

One dimensional array- Two dimensional array- Multidimensional array-Built in functions (Library functions): String Handling functions- User defined functions.

**UNIT IV - STRUCTURES, UNIONS AND POINTERS**

Structure definition- Arrays of structures- Structures and functions- Unions-Understanding pointers- Declaring and initializing pointers- Pointers and arrays- Pointers and functions- Pointers and structures.

**UNIT V - FILE MANAGEMENT**

Defining and Opening a file- Closing a file- Input output operations on files-Error Handling during I/O operations- Command line arguments.

**TEXT BOOK**

1. Balagurusamy.E (2008), *"Programming in ANSI C"* , Second Edition, Tata McGraw Hill.

**REFERENCES**


1. Kamthane Ashok.N (2013), *"PROBLEM SOLVING TECHNIQUES"*, 2nd Edition, Pearson Education.
2. Yashvant P. Kanetkar (2008*), "Let us C",* 8th Edition, Infinity science press.


| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| BCAD 2212 | PROBLEM SOLVING TECHNIQUES LABORATORY | 0 | 0 | 4 | 4 | 2 |

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| 1. | To acquire knowledge about basic Programming skills in C | a | | | | |
| 2. | To develop the skills in writing C program using the features for solving different problems | | | c | e | |
| 3. | To develop the skill for error corrections while executing the programs | | b | | | |

**LIST OF EXPERIMENTS**

1. Program to check whether a number is positive or negative or zero using if statement.
2. Program to check vowel or consonant using switch case statement.
3. Program to check whether a number is prime or not using while statement.
4. Program to generate multiplication table using do…while statement.
5. Program to check the given string is palindrome or not using for statement.
6. Program to display Fibonacci series.
7. Program to search an element in an array using linear search method.

8. Program to find the smallest and largest number among ‘n’ numbers.
9. Program to sort elements in an array.
10. Program to add two matrices.
11. Program for manipulating the strings using string handling functions.
12. Program to find the sum of ‘n’ numbers by making function.
13. Program to calculate factorial of a number using recursion.
14. Program to generate the marksheet of the student using structure.
15. Program to copy the content of one file to other file.

<table>
<tr><td colspan="6">Course Nature: Practical</td></tr>
<tr><td colspan="6">Assessment Method(Maximum marks)</td></tr>
<tr><td rowspan="2">In Semester</td><td rowspan="3">Assessment Tool</td><td>Practical exercises -I</td><td>Practical exercises -II</td><td>Practical exercises -III</td><td>Total</td></tr>
<tr><td>10</td><td>10</td><td>10</td><td>30</td></tr>
<tr><td>End Semester</td><td colspan="3">Practicals</td><td>70</td></tr>
<tr><td colspan="4"></td><td>Total</td><td>100</td></tr>
</table>

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2213** | **MATHEMATICS – I** | **4** | **1** | **0** | **5** | **5** |

| **INSTRUCTIONAL OBJECTIVES** At the end of this course the learner is expected: | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| **1.** | To apply basic concepts for clear | **a** | **b** | **e** | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | understanding of mathematical principles | | | | | |
| **2.** | To solve practical problems | **a** | **b** | | | |

**UNIT – I:**

**Sets, Relations and Functions**

Sets: sets, representation of sets, types of sets, operation on sets, Venn diagram.

Relation: Types of relation, equivalence relation.

Function: types of functions, composite of two functions, composit``e of three functions

**UNIT – II:**

**Mathematical connectives:** Logic - Statements, connectives, conjunction, disjunction, negation, tautology, contradiction, logical equivalence, tautological implications, arguments, validity of arguments – Normal forms – Principal disjunctive normal form - Principle conjunctive normal form.

**UNIT – III:**

**Theory of equations:** Polynomial equations, irrational roots, complex roots, (up to third order equations only) - Reciprocal equations, Approximation of roots of a polynomial equation by Newton's and Horner's methods.

**UNIT –IV: Matrices:** Symmetric, Skew symmetric, Hermitian, Skew Hermitian, Orthogonal, Unitary matrices – Cayley Hamilton Theorem – Eigen values – Eigen vectors – solving the equations using Cramers rule.

**UNIT – V:**

**Differentiation:** Simple problems only – maxima and minima of functions of single variable – Radius of curvature (Cartesian co–ordinate) – partial differentiation – Euler's theorem.

**TEXT BOOKS:**


1. Veerarajan, T. (2006) Discrete Mathematics, 7th Edition,Tata-Macgrawhill, New Delhi.
2. Singaravelu, A. (2011) ALLIED MATHEMATICS, 3rd Edition, Meenakshi Agency, Chennai.

**Treatment as in:** DISCRETE MATHEMATICS by Veerarajan, T.
Unit I: Chapter2 (pg.no: 51-70), Chapter4 (pg.no: 182-186) of
Unit II: Chapter 1(pg.no: 1-14)

**Treatment as in:** ALLIED MATHEMATICS by Singaravelu, A.
Unit III: Chapter 3(3.1 – 3.18, 3.36 – 3.60)
Unit IV: Chapter2 (2.1-2.22, 2.68-2.140)
Unit V: Chapter 5(5.1 – 5.12, 5.31 – 5.35, 5.52-5.60)

**REFERENCES:**


1. Vittal, P.R.(2013)Allied Mathematics,4th Edition Reprint, Margham Publications, Chennai.
2. Venkatachalapathy, S.G.(2007)Allied Mathematics, 1st Edition Reprint, Margham Publications, Chennai.


| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

**SEMESTER II**

| குறியீட்டு எண் | பாடம் | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **LATD 1921** | தமிழ் - II | **4** | **0** | **0** | **4** | **4** |

| **INSTRUCTIONAL OBJECTIVES**<br>At the end of this course the learner is expected: | **Student Outcomes** |
|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| **1.** | இரண்டாயிரம் ஆண்டுகாலத் தமிழின் தொன்மையையும் வரலாற்றையும் அதன் விழுமியங்களையும் பண்பாட்டையும் எடுத்துரைப்பதாக இப்பாடத்திட்டம் அமைக்கப் பட்டுள்ளது. | **e** | **f** | **h** | **m** | **n** |
| **2.** | காலந்தோறும் தமிழ் இலக்கியம் உள்ளடக்கத்திலும், வடிவத்திலும் பெற்ற மாற்றங்கள், அதன் சிந்தனைகள், அடையாளங்கள் ஆகியவற்றை காலந்தோறும் எழுதப்பட்ட இலக்கியங்களின் வழியாகக் கூறுவதாகவும், மொழியின் கட்டமைப்பைப் புரிந்து கொள்வதாகவும் பாடத்திட்டம் வடிவமைக்கப்பட்டுள்ளது. | **e** | **f** | **d** | | |
| **3.** | வாழ்வியல் சிந்தனைகள், ஒழுக்கவியல் கோட்பாடுகள், சமத்துவம், சூழலியல் எனப் பல கூறுகளை மாணவர்களுக்கு எடுத்துரைக்கும் விதத்தில் இப்பாடத்திட்டம் உருவாக்கப்பட்டுள்ளது. | **e** | **f** | **n** | | |

**அலகு – 1**

1. **எட்டுத்தொகை :** 1. குறுந்தொகை (பாடல் – 130), 2. நற்றிணை (பாடல் - 27), 3. அகநானூறு ( **பாடல்** – 86)
2. **பத்துப்பாட்டு -** சிறுபாணாற்றுப்படை **(**அடிகள் **-** 126-143)
3. **பதினெண் கீழ்க்கணக்கு** : திருக்குறள் - வெகுளாமை (அதிகாரம்31), காதல் சிறப்புரைத்தல் (அதிகாரம் 113)

**அலகு – 2**

1. **எட்டுத்தொகை :** 1**.** ஐங்குறுநூறு (பாடல் - 203), 2. கலித்தொகை - பாலைத்திணை (பாடல் - 9), 3. புறநானூறு (பாடல் - 235 )
2. **பத்துப்பாட்டு -** முல்லைப்பாட்டு (அடிகள் - 6 – 21)
3. **பதினெண் கீழ்க்கணக்கு -** 1. நாலடியார் - நல்லார் எனத்தான் (221), 2. திரிகடுகம் - கோலஞ்சி வாழும் குடியும் (33),
   3. இனியவை நாற்பது - குழவி தளர்நடை (14), கார் நாற்பது - நலமிகு கார்த்திகை (26), 5. களவழி நாற்பது - கவளங்கொள் யானை (14)

**அலகு - 3**

**சைவம் – பன்னிரு திருமுறைகள்**

1. திருஞானசம்பந்தர் - வேயுறு தோளிபங்கன் (இரண்டாம் திருமுறை)
2. திருநாவுக்கரசர் - மனமெனும் தோணி (நான்காம் திருமுறை)
3. சுந்தரர் - ஏழிசையாய் இசைப்பயனாய் (ஏழாம் திருமுறை)
4. மாணிக்கவாசகர் - ஆதியும் அந்தமும் இல்லா (திருவெம்பாவை)
5. திருமூலர் - அன்பு சிவம் இரண்டு (திருமந்திரம்)

**வைணவம் – நாலாயிரத் திவ்யப் பிரபந்தம்**

1. பேயாழ்வார் - திருக்கண்டேன் பொன்மேனி …
2. பெரியாழ்வார் - கருங்கண் தோகை மயிற் பீலி…

3. தொண்டரடிப்பொடி ஆழ்வார் - பச்சைமாமலை போல்...
4. ஆண்டாள் - கருப்பூரம் நாறுமோ? கமலப்பூ ...
5. திருமங்கையாழ்வார் - வாடினேன் வாடி வருந்தினேன்

**இஸ்லாமியம்**

**சீறாப்புராணம்** - -மானுக்குப் பிணை நின்ற படலம் – 5 பாடல்கள் (பாடல் எண்கள் : 61 - 65)

**கிறித்துவம்**

**இரட்சண்ய யாத்ரீகம் –** கடைதிறப்புப் படலம் **–** 5 பாடல்கள் (பாடல் எண்கள் : 3,9,10,15,16)

**அலகு – 4**

**தமிழ் இலக்கிய வரலாறு**

1. சங்க இலக்கியங்கள், 2. நீதி இலக்கியங்கள், 3.பக்தி இலக்கியங்கள், 4. காப்பியங்கள்

**அலகு – 5**

**சிறுகதைகள்**

1. புதுமைப்பித்தன் – அகலிகை
2. ந.பிச்சமூர்த்தி – வேப்பமரம்
3. அகிலன் – ஒரு வேளைச் சோறு
4. ஜி. நாகராஜன் – பச்சக் குதிரை
5. கி.ராஜநாராயணன் – கதவு
6. சா.கந்தசாமி – தக்கையின் மீது நான்கு கண்கள்
7. ஆண்டாள் பிரியதர்ஷினி – மாத்திரை
8. வண்ணதாசன் – ஒரு உல்லாசப் பயணம்
9. சு. தமிழ்ச்செல்வன் – வெயிலோடு போய்
10. பாரததேவி – மாப்பிள்ளை விருந்து

***பார்வை நூல்கள்***


1. *அரசு, வீ., இருபதாம் நூற்றாண்டுச் சிறுகதைகள் நூறு, அடையாளம் பதிப்பகம், திருச்சி, 2013*
2. *அருணாசலம், ப., பக்தி இலக்கியங்கள், பாரி நிலையம், சென்னை, 2010*
3. *தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை, 2000*
4. *பாக்யமேரி, வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு, என்.சி.பி. எச். பதிப்பகம், சென்னை, 2011*
5. *பசுபதி, ம.வே. செம்மொழித்தமிழ் இலக்கண இலக்கியங்கள், தமிழ்ப் பல்கலைக்கழகம், தஞ்சாவூர், 2010.*


| **Course Nature: Theory** |
|---|
| Assessment Method(Maximum marks) |

| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
|---|---|---|---|---|
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| LAHD 1921 | HINDI-II | 4 | 0 | 0 | 4 | 4 |

| | INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| 1. | To express and communicate literature which is part of life | e | f | h | m | n |
| 2. | To incorporate day to day personal and professionl life's need to communicate in the language. | e | f | | | |
| 3. | To help the students to imagine and express their mind through literature | e | f | | | |

**UNIT I - POETRY**

1. Kabir, Tulsi, Rahim, Bihari
2. Kaidi Aur Kokila - Makhan Lal Chaturvedi
3. Ab Aur Nahi - Om Prakash Valmiki
4. Prem Ka Rog - Kunwar Narayan
5. Maa Gaon Me Hai - Divik Ramesh
6. Adhik Naya Hota Hun - Liladhar Mandloi

**UNIT – II STORY**

1. Vaishnavi - Yashpal
2. Dopahar Ka Bhojan - Amarkant
3. Jungle - Chitra Mudgal
4. Kinare Se Door - Rakesh Bihari
5. Precious Baby - Anita Nair

**UNIT – III**

1. Adminstrative Words, Anuvad : Anuvad Ki Parisbhasha Evam Bhed

**UNIT – IV**

1. Anuvad : English To Hindi

**UNIT – V**

Technical terminology

Glossary of terms associated with different activities and their meanings and applications

**REFERENCES**


1. Prayojan Mulak Hindi – Madhav Sontakke
2. A Practical Guide To English Translation And Compostition – K.P. Thakur


| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| LAFD 1921 | FRENCH-II | 4 | 0 | 0 | 4 | 4 |

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| 1. | Improve their oral and written skills through a combination of theory and practice. | e | f | h | | |
| 2. | Consolidate the knowledge of theoretical aspects of French grammar with examples provided from different angles: from present day literature, day to day conversation. | e | f | m | | |

**Unité-I** **(15 heures)**

**C'est où ?** – Demander et indiquer une direction – Localiser (près de, en face de,….) - L'impératif – Quelques prépositions de lieu- Les articles contractés au, à la …. – Le passé composé et l'accord du participe passé avec être –Les nombres ordinaux – Ne…plus, ne … jamais – Les adjectifs numéraux ordinaux – Faire.

**Unité-II** **(15 heures)**

**N'oubliez pas !** - Exprimer l'obligation ou l'interdit – Conseiller – En dans les constructions avec de – Quelque chose, rien – Quelqu'un, personne – Il faut, devoir –Qui, que, où – Les pronoms compléments indirects (me, te, lui, leur…). **Belle vue sur la mer !** – Décrire un lieu –Situer – se situer dans le temps – La place des adjectifs – Des, De devant un adjectif – Le genre des noms de pays – Les prépositions et les noms de villes, de pays, de continents – Tout(e) (s), tous – Y, pronoms complément – Les adjectifs démonstratifs.

**Unité-III** **(15 heures)**

**Quel beau voyage !**- Raconter – Décrire les étapes d'une action – Exprimer l'intensité et la quantité – Interroger- Les verbes pronominaux – à la pièce, au kilo – un sachet de, un litre de … - d'abord, puis … - peu, assez, trop… - En pronom complément – L'interrogation par l'inversion et révision de l'interrogation – Partir.

**Unité-IV** **(15 heures)**

**Oh !joli !**- Décrire quelqu'un – comparer – Exprimer l'accord ou le désaccord – Se situer dans le temps –L'imparfait – L'imparfait ou le passé composé – la description d'une personne.

**Unité-V** **(15 heures)**

**Et après ?** - Parler de l'avenir- Exprimer des souhaits – Décrire quelqu'un- S'en aller, partir, quitter – Les indicateurs de temps (en, dans) – Le futur simple – Le subjonctif présent- La place des pronoms à l'impératif.

**Référence**

1. **''Latitudes-1''** Méthode de français, Regime Merieux, Yves Loiseau Les éditions Didier, Paris, 2012.

| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **LAED 1921** | **ENGLISH - II** | **4** | **0** | **0** | **4** | **4** |

| **INSTRUCTIONAL OBJECTIVES** At the end of this course the learner is expected: | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| **1.** | To enable the students to think in English | **e** | **f** | **h** | **m** | **n** |
| **2.** | To become aware of the world literature and the writers | **e** | **f** | **d** | | |
| **3** | To equip students with the awareness and strategies | **e** | **f** | **d** | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| · | needed to enable the study of English as a lifelong process. | | | | | |

**UNIT I – Poetry**

1. The Unknown citizen – Auden
2. Nada Kondro Kada Kondro- Pura Naanooru 187
3. On being Trans- Lee Mokobe
4. Girl Child – Pawani Mathur

**UNIT II - Prose**

1. Men and Women – Virginia Woolf
2. Farewell Speech of Mark Antony – William Shakespeare
3. The Autobiography of an unknown Indian –Nirad C.Chaudhuri

**UNIT III - Short Stories and Play**

1. A Wrong Man in Worker's Paradise – Rabindranath Tagore
2. Refund – Karen E.Bender
3. Paper Money – Razia Fasih Ahmad
4. Karukku - Bama

**UNIT IV - Popular Literature** Paul Simon : The Sound of Silence

1. Tedx Talks – If I had a daughter
2. John Lennon- I have a dream
3. Pink Floyd – Brick in the Wall

**UNIT V - Language Component**

Spot the Errors & Punctuation

1. Antonyms and Synonyms
2. Parts of speech
3. Articles
4. Vowels
5. Road Mapping
6. Movie Review
7. Crossword Puzzles
8. Open ended Stories
9. Quiz

**TEXT BOOK**

1. Cambridge University Press, Raymond Murphy, *Essential Grammar in Use* 3rd Edition 2010

| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD2221** | **WEB TECHNOLOGY** | **4** | **1** | **0** | **5** | **5** |

| **INSTRUCTIONAL OBJECTIVES**<br>**At the end of this course the learner is expected:** | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| 1. | To enrich the knowledge of scripting languages | | **a** | | | |
| 2. | To introduce advance HTML tags | | | **l** | | |
| 3. | To enable the learner to become a Web Designer | | | | **f** | **i** |

**UNIT I - CSS**

Cascading Style Sheet: HTML CSS-Inline styles- creating style sheets with the style elements- Building a web page.

**UNIT II - DOM**

DOM model: Understanding DOM model. Objects in HTML, Browser, object, window, history, location, navigator, document object.

**UNIT III - INTRODUCTION TO JAVA SCRIPT**

Java Script: Introduction to scripting-operators: logical-Increment and decrement operators- control structures.

**UNIT IV - FUNCTIONS, ARRAYS AND OBJECTS**

Functions: Definition-scope rules-recursion-Arrays: Declaring arrays-passing array to function-sorting arrays- object: math object-string object-data object- boolean object and number object, Handling event using java script.

**UNIT V - INTRODUCTION TO XML**

XML-XML overview-features-HTML XML-processing instructions-application of XML- COMMENTS-XML names space – schema-Document Type Definition (DTD) –Extensible style language (XSL).

**TEXT BOOKS**

1. Ivan Bayross (2005), "*Web enabled commercial application development using HTML, DHTML java script, peal CGI*", 3rd Edition, BPB Publications, New Delhi. (Unit I & II)
2. Deitel H M, Nieto T.R. (2011) "*Internet and world wide web How to program*", Fifth Edition, Prentice Hall of Indian Pvt. Ltd, New Delhi.(Unit III, IV,V)

**REFERENCE**

1. Deitel, Nieto,lin, Sadhu (2005), "*XML How to program*", Pearson Education .

| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD2222** | **WEB TECHNOLOGY** | 0 | 0 | 4 | 4 | 2 |

| | LABORATORY | | | | | |
|---|---|---|---|---|---|---|

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| **1.** | To acquire knowledge about basicHTML tags and Web page design | **a** | | | | **l** |
| **2.** | To enrich the knowledge of scripting languages. | a | | | | |
| **3.** | To enable the learner to become a Web Designer. | | | **f** | **i** | |

**LIST OF EXPERIMENTS**

1. Create a web page with table content.
2. Create a web site using links for text and images.
3. Display your bio-data using form controls.
4. Using frames, create web page for a travel agency.
5. Create a a style sheet and apply the styles in a web page.
6. Create an application to work with Document Object Model.
7. Calculate factorial of a number using function.
8. Create our department details using CSS.
9. Create calculator format using java script.
10. Create an array of 10 numbers and sort them using java script.
11. String manipulation using string object.
12. Create a web page which displays the mouse co-ordinates and image co-ordinates.
13. Create Employee details using schemas.
14. Create Payroll system using XSL.

| **Course Nature: Practical** |
|---|
| Assessment Method(Maximum marks) |

| | | | | | |
|---|---|---|---|---|---|
| In Semester | Assessment Tool | Practical exercises -I | Practical exercises -II | Practical exercises -III | Total |
| | | 10 | 10 | 10 | **30** |
| End Semester | | Practicals | | | **70** |
| | | | | **Total** | **100** |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2223** | **MATHEMATICS-II** | **4** | **1** | **0** | **5** | **5** |

| **INSTRUCTIONAL OBJECTIVES** At the end of this course the learner is expected: | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| **1.** | To apply Mathematical techniques for clear understanding of Mathematical principles | **a** | **b** | **e** | | |
| **2.** | To solve practical problems | **a** | **b** | | | |

**UNIT – I**

**Integral calculus** - polynomial and irrational function – partial fraction(Simple algebraic functions only) - Bernoulli's formula – $\int \sin^n x\,dx$ $\int \cos^n x\,dx$ $\int_0^{\frac{\pi}{2}} \sin^n x dx$ $\int_0^{\frac{\pi}{2}} \cos^n x dx$ reduction formula- - - -

**UNIT - II**

**Trigonometry** – Expansion of sin nθ, cos nθ and tan nθ – expansion of $Sin^n\theta$ and $Cos^n\theta$ - Expansion of $Sin^n\theta.Cos^n\theta$

**UNIT – III**

**Differential Equation:** Second order Differential Equations with constant coefficients. Problem based on R.H.S:

$0, e^{ax}, Sin\, ax, Cos\, ax, x$ .

**UNIT – IV**

**Laplace Transformation** – basic properties and simple problems – $L[e^{at} f(t)]$ – $L[tf(t)]$ –

$$L[e^{at} tf(t)] - L\left[\frac{f(t)}{t}\right]$$

**UNIT – V**

**Inverse Laplace transformation** – Simple Problems based on Inverse Laplace Transformation - multiplied by 's'- multiplied by '1/s'- 'Partial Fraction Method'.

**TEXT BOOK**

1. Singaravelu, A. (2011), ALLIED MATHEMATICS, 3rd Edition, Meenakshi Agency, Chennai.

**Treatment as in :** ALLIED MATHEMATICS by Dr.A. Singaravelu.
Unit I: Chapter7 (7.1 – 7.85)(Simple Algebraic functions only), (7.87 – 7.95)
Unit II: Chapter6 (6.1 – 6.24)
Unit III: Chapter8 (8.41 – 8.50), (8.54 – 8.65), (8.70 – 8.86)
Unit IV: Chapter10 (10.1 – 10.27), (10.36 – 10.47)
Unit V: Chapter10 (10.64 – 10.82), (10.90-10.95)

**REFERENCES**


1. Vittal, P.R.(2013), "*Allied Mathematics"*, 4th Edition Reprint,Margham Publications, Chennai.
2. Venkatachalapathy, S.G.(2007), *"Allied Mathematics"*, 1st Edition Reprint, Margham Publications, Chennai.
3. Manickavasagam Pillai, T.K. and Narayanan, S. (2013), "*Ancillary Mathematics"*, Reprint, S.Viswanathan Printers & Publishers Pvt. Ltd.Chennai.

| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

## SEMESTER – III

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| BCAD 2231 | PROGRAMMING IN JAVA | 4 | 1 | 0 | 5 | 4 |

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| 1. | To understand the principles and concepts of object oriented programming | **a** | | | | |
| 2. | To learn multithreading concepts | a | | | | |
| 3. | To enable the learner to become a Java Programmer. | | **e** | **l** | **k** | |

**UNIT I - INTRODUCTION TO JAVA**

The Genesis of Java- Buzzwords- Object oriented Concepts- Lexical Issues- Data types and variables- Arrays- Operators - Control Statements: Selection- Iteration and jump Statement.

**UNIT II - CLASSES AND METHODS**

Introducing classes - Class fundamentals - Declaring Objects - Assigning object reference variables. Introducing method – Constructors- The this Keyword- Garbage Collection- Finalize() method- Overloading methods- Using objects as parameters- Argument Passing - Returning Objects- Recursion – static and final keyword - Nested and Inner Classes - String Class - Command Line arguments.

**UNIT III - INHERITANCE, PACKAGES, INTERFACES**

Inheritance Basics - using Super- method Overriding – Dynamic method dispatch - abstract classes- Using final with Inheritance – Packages – Access Protection – Importing packages –Interfaces.

**UNIT IV - EXCEPTION HANDLING, MULTITHREADING, APPLET**

Exception handling fundamentals- Types- Using try, catch, throw, throws and finally - Java thread model – Creating a Thread – Creating multiple threads - Thread priorities – synchronization - Inter-thread

communication - Applet Basics – Applet Skeleton – HTML applet tag – Passing parameters to applet

**UNIT V - I/O STREAMS, UTILITY CLASSES, EVENT HANDLING**

I/O Streams: Byte Streams – Character Streams – Reading and Writing Files –– Legacy Classes and Interface: Vector, Stack, The Enumeration Interface - Utility classes: String Tokenizer, Date, Calendar, GregorianCalendar, Random, Scanner – Introduction to Event Handling : Event Classes – Event Listener Interfaces

**TEXT BOOK**

1. Herbert Schildt, (2007), "*Java : The Complete Reference*", Seventh Edition, McGraw Hill.

**REFERENCES**

1. Arnold and J.Gosling (2000), "*The Java Programming Language*", Second edition, Addision Wesley.
2. Art Gittleman (2002), " *Ultimate Java Programming*", Wiley Publications.

| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2232** | **RELATIONAL DATABASE MANAGEMENT** | **4** | **1** | **0** | **5** | **5** |

| **INSTRUCTIONAL OBJECTIVES** | **Student Outcomes** |
|---|---|
| At the end of this course the learner is expected: | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | To gain knowledge in the areas of database design and SQL programming. | **a** | **c** | | | |
| 2. | To understand relational database technology and designing database for building applications for the current trend. | **a** | **c** | **i** | | |
| 3. | To analyze a business situation and build suitable database applications. | **a** | **c** | **i** | | |

**UNIT I - INTRODUCTION**

Data- Database – DBMS-File Processing System Vs DBMS- - Data Independence-Data Catalog-Three schema Architecture of a database-Functional components of DBMS - ER Model: Entity - Attributes and its Type -Entity and Relationship ship-Design Issues of ER Model - Constraints.

**UNIT II - STRUCTURED QUERY LANGUAGE (SQL)**

Overview of SQL, Data Definition Commands, Set operations, Aggregate function, Null values, Data Manipulation commands, Data Control commands, Views in SQL, Nested and Complex queries

**UNIT III - RELATIONAL–DATABASE DESIGN**

Relational–Database Design: Design guidelines for relational schema, Function dependencies, Normal Forms- 1NF, 2 NF, 3NF, BCNF and 4NF. Integrity and Security in Database: Domain Constraints, Referential integrity.

**UNIT IV - TRANSACTIONS MANAGEMENT**

Transactions Management: Transaction concept, Transaction states, ACID properties, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of isolation.

**UNIT V - CONCURRENCY CONTROL & PHYSICAL STORAGE MEDIA**

Concurrency Control: Lock-based, Timestamp-based, Validation-based protocols, Deadlock handling, Recovery System: Failure Classification, Storage structure. Overview of Physical Storage Media:

Magnetic Disks – RAID – Tertiary storage – File Organization – Organization of Records in Files – Indexing and Hashing –Ordered Indices– Static Hashing – Dynamic Hashing.

**TEXT BOOKS**

1. Abraham Silberschatz, Henry F. Korth, Sudharshan S., (2006), "Database System Concepts", Fifth Edition, Tata McGraw Hill.(Unit I, IV & V)
2. Date C.J., Kannan A., Swamynathan S., (2006), "An Introduction to Database Systems", Eighth Edition, Pearson Education.(Unit II & III)

**REFERENCE**

1. Ramez Elmasri, Shamkant B. Navathe (2007), "Fundamentals of Database Systems", Fourth Edition , Pearson / Addision wesley.

| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2233** | **PROGRAMMING IN JAVA LABORATORY** | **0** | **0** | **4** | **4** | **2** |

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| 1. | To acquire knowledge about basic Programming skills in Java | **a** | | | | |
| 2. | To develop the skills in writing Java program using the features for solving different problems | | | **c** | **e** | |
| 3. | To develop the skill for error corrections while executing the programs | | **b** | | | |

**LIST OF EXPERIMENTS**

1. Program to illustrate the use of classes and objects
2. Program to illustrate the use of String Class
3. Program to illustrate the use of final and static keyword
4. Program to illustrate the use of inheritance
5. Program to illustrate the use of interfaces
6. Program to illustrate the use of packages
7. Program to illustrate the use of multithreading
8. Program to illustrate the use of Exception handling
9. Program to illustrate the use of Utility classes
10. Program to create and read file.
11. Program to create applet and pass parameter to it
12. Program to illustrate handling of mouse event

Other than these, possible lab exercises related to syllabus can also be included.

| **Course Nature: Practical** | | | | | |
|---|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | | |
| In Semester | Assessment Tool | Practical exercises -I | Practical exercises -II | Practical exercises -III | Total |

| | | | | | |
|---|---|---|---|---|---|
| | | 10 | 10 | 10 | **30** |
| End Semester | | Practicals | | | **70** |
| | | | | **Total** | **100** |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2234** | **RELATIONAL DATABASE MANAGEMENT LABORATORY** | **0** | **0** | **4** | **4** | **2** |

| **INSTRUCTIONAL OBJECTIVES** At the end of this course the learner is expected: | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| **1.** | To acquire knowledge about basic SQL commands | **a** | | | | |
| **2.** | To develop the skills in writing PL/SQL program features for solving different problems | | | **c** | **e** | |
| **3.** | To develop the skill for error corrections while executing the PL/SQL programs | | **b** | | | |

**LIST OF EXPERIMENTS**
**SQL:**

1. TABLE CREATION:

a) Create table CUST based on the following details

| Name | Type | Remark |
|---|---|---|
| CID | VARCHAR2(6) | PRIMARY KEY |
| CNAME | VARCHAR2(10) | |
| CCITY | VARCHAR2(8) | |

b) Create table PROD based on the following details

| Name | Type | Remark |
|---|---|---|
| PID | VARCHAR2(6) | PRIMARY KEY |
| PNAME | VARCHAR2(6) | |
| PCOST | NUMBER(4,2) | |
| PPROFIT | NUMBER(3) | |

c) Create table SALE_DETAIL based on the following details

| Name | Type | Remark |
|---|---|---|
| CID | VARCHAR2(6) | COMPOSITE PRIMARY KEY |
| PID | VARCHAR2(6) | COMPOSITE PRIMARY KEY |
| SALE | NUMBER(3) | |
| SALEDT | DATE | |

1. **INSERTION AND DATA RETRIEVAL:**
   a) Insert and Save Records in CUST, PROD and SALE_DETAIL table.
   b) Data Retrieval using SELECT-WHERE, RELATIONAL OPERATOR, ARITHMETIC OPERATOR and use of ORDERBY, DISTINCT, BETWEEN, IN, DUAL and LIKE operator.

2. **FUNCTIONS:**
   a) Date Functions, Numeric Functions, Character Functions, Conversion Functions.
   b) Group Functions, Set Functions.

3. **ALTER, UPDATE, DELETE, SUBQUERY AND JOINS:**
   a) Use of ALTER, UPDATE, DELETE and DROP Commands.
   b) Using SUBQUERY and JOINS (Equi Join, Non-Equi Join, Outer Join, Self Join) in data retrieval.
   c) Create Views, Sequences and Constraints related Query.

**PL/SQL:**

1. Make use of COMMIT, ROLLBACK, and SAVEPOINT in a PL/SQL Block.
2. Create a PL/SQL Script to convert temperature in Fahrenheit into Celsius, and vice versa.
3. Write PL/SQL block using looping statements.
4. Create a PL/SQL block to find ODD or EVEN NUMBER by using Searched CASE Statements.
5. Program development using BUILT –IN Exceptions, USER defined Exceptions, RAISE- APPLICATION ERROR.

6. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.
7. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.
8. Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.
9. Develop programs using CURSORS-Declaring, Opening, Fetching, and Closing a Cursor, including the use of CURSOR attributes.
10. Develop Programs using BEFORE and AFTER Triggers, and INSTEAD OF Triggers.

<table>
<tr><td colspan="6">Course Nature: Practical</td></tr>
<tr><td colspan="6">Assessment Method(Maximum marks)</td></tr>
<tr><td rowspan="2">In Semester</td><td rowspan="3">Assessment Tool</td><td>Practical exercises -I</td><td>Practical exercises -II</td><td>Practical exercises -III</td><td>Total</td></tr>
<tr><td>10</td><td>10</td><td>10</td><td>30</td></tr>
<tr><td>End Semester</td><td colspan="3">Practicals</td><td>70</td></tr>
<tr><td colspan="5">Total</td><td>100</td></tr>
</table>

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2235** | **FUNDAMENTALS OF DATA STRUCTURES AND ALGORITHMS** | **4** | **0** | **0** | **4** | **4** |

| **INSTRUCTIONAL OBJECTIVES** **At the end of this course the learner is expected:** | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| **1.** | To learn Several data structure concepts like stack, queue, linked list, trees and files | a | c | | | |
| **2.** | To learn the Applications of data structures | a | b | | | |
| **3.** | To improve the Problem solving quality using data structure techniques. | b | d | | | |

**UNIT I - INTRODUCTION TO DATA STRUCTURES**

Definition – types of data structure-abstract data type-array as an abstract data type- representation of array- sparse matrices-asymptotic notation.

**UNIT II - STACKS QUEUES AND LINKED LIST**

Stacks - queues - multiple stack and queue - Singly linked list – Operations on Singly linked list - Doubly linked list – Operations on doubly linked list – Circular linked list.

**UNIT – III – INTRODUCTION TO ALGORITHMS**

Introduction to Algorithms – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamentals of the Analysis Framework

**UNIT – IV – RECURSIVE AND NON RECURSIVE ALGORITHMS**

Mathematical Analysis of Non-recursive Algorithm – Mathematical Analysis of Recursive Algorithm – Example: Fibonacci Numbers – Empirical Analysis of Algorithms – Algorithm Visualization.

**UNIT – V – SORTING, SEARCHING TECHNIQUES AND TREES**

Brute Force – Selection Sort and Bubble Sort – Sequential Search and Brute-force string matching – Divide and conquer – Merge sort – Quick Sort – Binary Search – Binary tree- Traversal and Related Properties – Decrease and Conquer – Insertion Sort.

**TEXT BOOKS**

1. Ellis Horowitz, Sahni, Dinesh Mehta (1999), “Fundamentals of Data Structures in C++”, Golgotha publication, New Delhi.
2. Anany Levitin (2003), “Introduction to the Design and Analysis of Algorithm”, Pearson Education Asia.

**REFERENCE**

1. Weiss Mark Allen (2006), “Data Structure and algorithm analysis”, Pearson Education.

| **Course Nature: Theory** |
| --- |
| Assessment Method(Maximum marks) |

| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
|---|---|---|---|---|
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

**SEMESTER – IV**

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD2241** | **MULTIMEDIA AND ANIMATION** | **4** | **1** | **0** | **5** | **5** |

| **INSTRUCTIONAL OBJECTIVES** At the end of this course the learner is expected: | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| **1.** | To understand the different components, different file formats and various tools of multimedia system | **a** | **b** | | | |
| **2.** | To gain knowledge in Animation and images | | | **c** | **l** | |

**UNIT - I**

Multimedia: What Is Multimedia: Interactive Multimedia – Advantages Of Interactive Multimedia – Where To Use Multimedia – Text – Graphics – Audio – Film – Video. Understanding Text: Typeface or Fonts – Types of Fonts. Computer Graphics: 2D Computer Graphics – 3D Computer Graphics API. Understanding Sound: Basic Sound Concept – Audio Formats and Quality Levels – AIF Format – AU Format – EA Format – MIDI Format – Mp3 Format. Understanding Video: Digital Vs Analog Video.

**UNIT - II**

Photoshop: Fundamentals – Opening and Importing Images – Resolution – Models and Colour Spaces – Layers. Painting Pixels: The Painting Tools – Erasing – Fills – Type. Selection and Allied Operations: Marquee selection and cropping – Lasso Selection – Paths – Combining and Transforming Selections.

**UNIT - III**

Adjustments and Retouching: Tonal Adjustment – Colour Adjustments – Retouching By Hand. Effects and Filters: Blurring and Sharpening – Special Effects and Distortion – Layer Effects and Layer Styles.

**UNIT - IV**

FLASH: Animation with Interacting – Basic Concepts – Drawing – Lines and Shapes – Strokes and Fill – Shapes and Brushes – Selection – Transformation and Reshaping – Importing Artwork and Manipulating Images. ANIMATION: Animating One Frame at a Time – Motion Tweening – Symbols and Instances – Shape Tweening – Sound.

**UNIT - V**

ACTIONS: Buttons – Button action – Frame Action – Action and Movie Clip Symbols – Actions – Browsers and Networks – Beyond the Basic Actions. FLASH MX275: Interface Elements – Panels – Tools – Layer Folders – Accessibility – Video – Components – User Interface Components – Changing the Appearance of Components.

**TEXT BOOKS**


1. Vishnu Priya Singh (2006), "*A Text Book of Multimedia*", 1st Ed., Computech Pub. Ltd, New Delhi,. UNIT I
2. Nigel Chapman and Jenny Chapman, "*Practical Multimedia*", 2nd Ed., Wiley – Dream Tech Pvt. Ltd. UNITS II, III, IV & V


**REFERENCES**


1. Thiagharajan and Anbumani, "*Flash MX 2004*", Tata McGraw Hill, New Delhi.
2. Laurie Ulrich Fuller and Robert C. Fuller, "*Photoshop CS3 Bible*", Willey India Pvt. Ltd.


**Course Nature: Theory**

| Assessment Method(Maximum marks) | | | | |
|---|---|---|---|---|
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2242** | **WINDOWS PROGRAMMING USING VB .NET** | **4** | **1** | **0** | **5** | **5** |

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| **1.** | To gain knowledge in the concepts of the .NET framework as a whole and the technologies that constitute the framework | a | | | | |
| **2.** | To gain knowledge about various object oriented concepts in VB.Net. | | b | | | |
| **3.** | To gain programming skills in VB.Net both in basic and advanced levels. | | c | e | | |
| **4.** | To enable the learner for aiming careers in software development related fields | | | l | j | k |

**UNIT - I**

Net Framework and VB.NET: Evolution of the .NET Framework – Overview of the .Net Framework – VB.NET – Simple VB.Net Program. Variables, Constants and Expressions: Value Types and Reference Types – Variable Declarations and Initializations – Value Data Types – Reference Data Types – Boxing and Unboxing – Arithmetic Operators – Textbox Control – Label Control – Button Control.

**UNIT - II**

Control Statements: If Statements – Radio Button Control – Check Box Control – Group Box Control – Listbox Control – Checked List Box Control – Combo box Control – Select Case Statement – While Statement – Do Statement – For Statement. Methods and Arrays: Types of Methods – One Dimensional Array – Multi Dimensional Arrays – Jagged Arrays. Classes: Definition And Usage of a Class – Constructor Overloading – Copy Constructor – Instance and Shared Class Members – Shared Constructors.

**UNIT – III**

INHERITANCE AND POLYMORPHISM: Virtual Methods – Abstract Class and Abstract Methods – Sealed Classes. INTERFACES, NAMESPACES AND COMPONENTS: Definition of Interfaces – Multiple Implementations of Interfaces – Interface Inheritance – Namespaces – Components – Access Modifiers.

**UNIT - IV**

EXCEPTION HANDLING: Default Exception Handling Mechanism – User Defined Exception Handling Mechanism – Throw Statement – Custom Exception. MULTITHREADING: Usage Of Threads – Thread Class – Start(), Abort(), Join(), and Sleep() Methods – Suspend() And Resume() Methods – Thread Priority – Synchronization. I/O STREAMS: Binary Data Files – Text Files - Data Files – FileInfo and DirectoryInfo Classes.

**UNIT - V** **(15 Hours)**

SDI & MDI – Dialog Boxes – Toolbar – StatusBar. DATABASE CONNECTIVITY: Advantages Of ADO.NET – Managed Data Providers – Developing a Simple ADO.NET Based Application – Creation of Data Table – Retrieving Data From Tables – Table Updating.

**TEXT BOOK**

1. Muthu C. (2008), "*Visual Basic.NET*", 2nd Ed., Vijay Nicole Imprints Pvt.Ltd.,.

**REFERRENCES**


1. Jeffrey R.Shaprio (2002), "*Visual Basic .NET The Complete Reference*", Mac Graw Hill
2. Michael Halvorson (2010), "*Visual Basic 2010 Step by Step*", Microsoft Press.
3. Harold Davis (2002 ), "*Visual Basic.NET Programming"*, Sybex.


| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2243** | **MULTIMEDIA AND ANIMATION LABORATORY** | **0** | **0** | **4** | **4** | **2** |

| **INSTRUCTIONAL OBJECTIVES** At the end of this course the learner is expected: | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| **1.** | To acquire basic knowledge about basic Photoshop and Flash | **a** | **b** | | | |
| **2.** | To develop the skills in spplying the tools for solving different problems | | | **c** | **e** | |

**LIST OF EXPERIMENTS**

**Photoshop**

1. Create an image using different properties.
2. Picture manipulation using filter.
3. Design pictures using layers.
4. Design our college ID Card.

5. Design Marriage Invitation.

**Flash**

6. Design a car.
7. Move a Ball.
8. Human Movement using animation.
9. Create an Advertisement.
10. Develop a webpage using Photoshop and flash.

| **Course Nature: Practical** | | | | | |
|---|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | | |
| In Semester | Assessment Tool | Practical exercises -I | Practical exercises -II | Practical exercises -III | Total |
| | | 10 | 10 | 10 | **30** |
| End Semester | | Practicals | | | **70** |
| | | | | **Total** | **100** |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2244** | **WINDOWS PROGRAMMING USING VB .NET LABORATORY** | **0** | **0** | **4** | **4** | **2** |

| **INSTRUCTIONAL OBJECTIVES** At the end of this course the learner is expected: | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| **1.** | To acquire basic knowledge about basic programming techniques in .Net | **a** | **b** | | | |
| **2.** | To develop the skills in spplying the tools for solving different problems | | | **c** | **e** | |

**LIST OF EXPERIMENTS**

1. Develop an Image Viewer Application
2. Simulate a Math Calculator
3. Develop a Notepad Editor using Dialog Control
4. Develop an Application to draw different shapes.
5. To Move an object using Timer Control
6. Develop a Simple Student Information System Using Files
7. Develop a College Admission Form Using MDI
8. Validate a Bio – Data Application Form
9. Develop an Inventory Control System Using ADO.NET
10. Develop a mark sheet preparation system Using Grid Control.

Other than these, possible lab exercises related to syllabus can also be included.

<table>
<tr><td colspan="6">Course Nature: Practical</td></tr>
<tr><td colspan="6">Assessment Method(Maximum marks)</td></tr>
<tr><td rowspan="2">In Semester</td><td rowspan="3">Assessment Tool</td><td>Practical exercises -I</td><td>Practical exercises -II</td><td>Practical exercises -III</td><td>Total</td></tr>
<tr><td>10</td><td>10</td><td>10</td><td>30</td></tr>
<tr><td>End Semester</td><td colspan="3">Practicals</td><td>70</td></tr>
<tr><td colspan="4"></td><td>Total</td><td>100</td></tr>
</table>

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2245** | **PYTHON PROGRAMING** | **2** | **0** | **4** | **6** | **4** |

| **INSTRUCTIONAL OBJECTIVES** At the end of this course the learner is expected: | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| 1. | To know the basics of algorithmic problem solving and Python programming | **a** | **b** | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | To develop the programming skill in PYTHON | **a** | **b** | **c** | **e** | |

**UNIT I - ALGORITHMIC PROBLEM SOLVING**

Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a list of sorted cards, guess an integer number in a range.

**UNIT II - DATA, EXPRESSIONS, STATEMENTS**

Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

**UNIT III - CONTROL FLOW, FUNCTIONS**

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

**UNIT IV - LISTS, TUPLES, DICTIONARIES**

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing - list comprehension; Illustrative programs: selection sort, insertion sort, mergesort, histogram.

**UNIT V FILES, MODULES, PACKAGES**

Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file.

**TEXT BOOKS**


1. Allen B. Downey (2016), "Think Python: How to think like a Computer Scientist", 2nd Edition, O' Reilly Publishers.
2. Guide Van Rossum and Fred L. Drake Jr (2011), "An Introduction to Python", Network Theory Ltd.


**REFERENCES**


1. John V Gultag(2013),"Introduction to Computation and Programming Using Python", MIT Press
2. Kenneth A. Lambert (2012), "Fundamentals of Python:First Programs", CENGAGE Learning.


<table>
<tr><td colspan="7">Course Nature: Theory-Cum-Practical</td></tr>
<tr><td colspan="7">Assessment Method(Maximum marks)</td></tr>
<tr><td rowspan="3">In Semester</td><td rowspan="3">Assessment Tool</td><td colspan="2">Practical exercises -I</td><td colspan="2">Practical exercises -II</td><td rowspan="3">Total</td></tr>
<tr><td>Theory</td><td>Practical</td><td>Theory</td><td>Practical</td></tr>
<tr><td>10</td><td>5</td><td>10</td><td>5</td></tr>
<tr><td></td><td>Total</td><td colspan="2">15</td><td colspan="2">15</td><td>30</td></tr>
<tr><td rowspan="2">End Semester</td><td rowspan="2">Marks</td><td colspan="3">Theory</td><td>Practical</td><td rowspan="2">70</td></tr>
<tr><td colspan="3">40</td><td>30</td></tr>
<tr><td colspan="6">Total</td><td>100</td></tr>
</table>

**SEMESTER V**

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| BCAD 2251 | SOFTWARE ENGINEERING AND TESTING | 4 | 0 | 0 | 4 | 4 |

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| 1. | To classify the various Software Process Models | a | | l | | |
| 2. | To understand the Software Testing Concepts. | | e | | | |
| 3. | To implement the Software Quality and Control Concepts | | b | | | j |
| 4. | To Design the Test cases and to get familiarity over Automated Testing tools | a | | | | j |

**UNIT I - THE PRODUCT AND THE PROCESS**

The Evolving Role of Software– Software Characteristics– Software Applications– Software: A Crisis on the Horizon?- Software Myths- Software Engineering: A Layered Technology– The Software Process– Software Process Models– The Linear Sequential Model– The Prototyping Model- The RAD Model- Evolutionary Software Process Models- Component-Based Development.

**UNIT II - SYSTEM ENGINEERING AND ANALYSIS CONCEPTS**

Computer-Based Systems– The System Engineering Hierarchy – Business Process Engineering: An Overview– Product Engineering: An Overview– Requirements Engineering– System Modeling– Requirement Analysis- Requirements Elicitation for Software- Software Prototyping- Specification- Specification Review.

**UNIT III PRINCIPLES OF TESTING**

PRINCIPLES OF TESTING: Introduction - Phases of software – Quality assurance and Quality control - Testing verification and validation - TECHNIQUES: White box - static testing - structural testing - challenges in white box testing - Black box testing.

**UNIT IV - TYPES OF TESTING**

TYPES OF TESTING: Integration testing - Top-Down Integration – Bottomup integration-Bi-Directional Integration - System - Integration – SYSTEM ACCEPTANCE TESTING: Functional versus Non Functional Testing - Functional System Testing - Non Functional Testing Acceptance Testing.

**UNIT V - PERFORMANCE TESTING**

PERFORMANCE TESTING: Introduction - Factors of governing - performance testing - Methodology for performance testing - Tools for performance testing - Process for performance Testing – REGRESSION TESTING : Introduction - Types regression testing - Best pratice in regression testing.

**TEXT BOOKS**


1. Roger S. Pressman, (2001), "*Software Engineering* ", Fifth edition, McGraw-Hill Higher Education - A Division of The McGraw-Hill Companies.
2. Srinivasan Desikan and Gopalasamy Ramesh, "*Software Testing for Principles and Practices*", Person Education,.


**REFERENCES**


1. William E. Perry (2006), "*Effective Methods of Software Testing*", 3rd Ed, Wiley India.
2. Renu Rajani, Pradeep Oak (2007), *"Software Testing"*, TMH.


| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| BCAD 2252 | PHP AND MYSQL PROGRAMMING | 4 | 1 | 0 | 5 | 4 |

**INSTRUCTIONAL OBJECTIVES**

At the end of this course the learner is expected:

1. To create dynamic Web pages and web platform Applications
2. To create and to use Graphical, Database objects for interactive web applications such as Cloud solutions

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| **1.** | To Understand PHP and MYSQL | **a** | **i** | | | |
| **2.** | To have clear understanding about the Network programming | **a** | **c** | **e** | | |

**UNIT I - BASICS OF PHP**

Introduction to PHP – what does PHP Do? – a brief history of PHP – language basics – lexical structure – data types – variables – expressions and operators – flow control statements – including code – embedding PHP in web pages.

**UNIT II - FUNCTIONS & STRINGS**

Functions & Strings: Calling a function – defining a function – variable scope – function parameters – return values – variable functions – anonymous functions. Strings: Accessing individual characters – cleaning strings – encoding and escaping – comparing strings – manipulating and searching strings – regular expression.

**UNIT III - ARRAYS & OBJECTS**

Arrays and Objects : Indexed Vs associative arrays – identifying elements of an array – storing data in arrays – multidimensional arrays – extracting multiple values – converting between arrays and variables – traversing arrays – sorting. Objects: Creating an object – accessing properties and methods – declaring a class – introspection.

**UNIT IV - MYSQL AN OVERVIEW**

Introduction – connecting to and disconnecting from the server – Entering queries – Creating and using a database – Creating and selecting a database – creating a table – loading data into a table – Retrieving information from a table – selecting all data – selecting particular rows – selecting particular columns – sorting rows – date calculations – working with NULL values – pattern matching – counting rows – using more than one tables.

**UNIT V - MYSQL DATABASES IN PHP**

Introduction – connecting to a MySQL database – querying the database – Retrieving and displaying the results – modifying data – deleting data. Designing simple applications.

**TEXT BOOKS**

1. Rasmus Lerdorf, Kevin Tatroe, Bob Kaehms, Ric McGredy (2002), Programming PHP, O'REILLY(SPD). (Unit I,II & III)
2. Lee Babin, Nathan A. Good, Frank M. Kromann, Jon Stephens (2005), "PHP 5 Recipes, A problem solution approach", après.(Unit IV & V)

**REFERENCE**

1. Vikram Vaswani (2008), PHP: A BEGINNER'S GUIDE, McGraw-Hill.

| Course Nature: Theory | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2253** | **OPERATING SYSTEM** | **4** | **1** | **0** | **5** | **5** |

**INSTRUCTIONAL OBJECTIVES**

At the end of this course the learner is expected:

1. To learn different types of Operating Systems
2. To Perform Scheduling and memory management.
3. To Handle Components of Operating System and Deadlocks

**UNIT - INTRODUCTION**

Definition – Mainframe system – Desktop Systems – Multiprocessor systems – Distributed systems – clustered systems – Real time and Hand held systems – System components – OS Services – System Calls – Programs.

**UNIT II - PROCESSES & SCHEDULING**

Process concepts – Process Scheduling – operation on Process – Cooperating process – IPC – CPU Scheduling: Basic Concepts – Scheduling criteria – Scheduling algorithms – Multiprocessor Scheduling – Real time Scheduling.

**UNIT III - PROCESS SYNCHRONIZATION**

Background – The critical Section problem – synchronization hardware – semaphores – Classic Problems of Synchronization - critical Regions – Monitors.

**UNIT IV - DEADLOCKS**

System model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock prevention – Deadlock Avoidance – Deadlock Detection and Recovery from Deadlock.

**UNIT V - MEMORY MANAGEMENT**

Swapping – Contiguous memory Allocation – Paging – segmentation – segmentation with paging – Demand Paging – Process creation – Page Replacement – Thrashing

**TEXT BOOK**

1. Abraham Silberschatz, Peter Baer Galvin & Greg Gagne (2006), "Operating System Concepts", Sixth Edition, John Wiley & Sons, Inc.

**REFERENCES**

1. Milankovic M (1992),"Operating System concepts and Design, 2nd edition, Tata Mcgraw hill.
2. Deitel H.M. (2002), "An Introduction to Operating Sysems",2nd edition, Pearson Education.

| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2254** | **PHP AND MYSQL PROGRAMMING LABORATORY** | **0** | **0** | **4** | **4** | **2** |

| **INSTRUCTIONAL OBJECTIVES**<br>At the end of this course the learner is expected: | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| **1.** | To acquire basic knowledge about programming in PHP | **a** | **b** | | | |
| **2.** | To acquire basic knowledge about MYSQL database | **a** | **b** | | | |
| **3.** | To develop the skills in spplying the tools for solving basic problems in computer networks | | | **c** | **e** | |

**LIST OF EXPERIMENTS**

1. Creating simple webpage using PHP
2. Use of conditional statements in PHP
3. Use of looping statements in PHP
4. Creating different types of arrays
5. Usage of array functions
6. Creating user defined functions
7. Creating simple applications using PHP
8. Creating simple table with constraints
9. Insertion, Updation and Deletion of rows in MYSQL tables
10. Searching of data by different criteria
11. Sorting of data
12. Working with string and date functions
13. Database connectivity in PHP with MySQL

Any Application Using PHP and MySQL based on syllabus can be included.

| **Course Nature: Practical** | | | | | |
|---|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | | |
| In Semester | Assessment Tool | Practical exercises -I | Practical exercises -II | Practical exercises -III | Total |
| | | 10 | 10 | 10 | **30** |
| End Semester | | Practicals | | | **70** |
| | | | | **Total** | **100** |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| BCAD 2255 | INTRODUCTION TO R PROGRAMMING | 0 | 2 | 2 | 4 | 3 |

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| 1. | To learn about R Programming | c | | | | |
| 2. | To understand the basics of R Programming | b | d | | | |
| 3. | To analyze and acquire knowledge in Data Science using R Language | | d | | | |
| 4. | To write codes for various operations of Statistical Models | | e | l | | |

**UNIT - I**

INTRODUCTION TO R : The R Evironment – CLI – Rstudio – Revolution Analytics RPE – Installing, Loading, Building Packages – Basic Math – Variables, Datatypes, Vectors – Calling Functions – Missing Data

**UNIT - II**

DATA STRUCTURES: data.frames – Lists – Matrices – Arrays – Reading CSVs – Excel Data – Reading from Databases – Data From Statistical Tools – R binary Files – Extract Data from Web sites

**UNIT - III**

GRAPHICS AND FUNCTIONS: Base Graphics – ggplot2 – Writing R Functions – Function Arguments – Return Values – do.call

**UNIT - IV**

CONTROL STATEMENTS AND LOOPS: if and else – switch – ifelse – Compound Tests – for Loops – while Loops – Conrolling Loops – Group Manipulation – Data Reshaping – Manipulating Strings

**UNIT - V**

PROBABILITY DISTRIBUTION AND STATISTICS : Normal Distribution – Binomial Distribution – Poisson Distribution – Other Distribution – Summary Statistics – Correlation and Covariance – T-Tests – ANOVA – Linear an Non Linear Models

**TEXT BOOK**

1. Jared P.Lander (2014). *"R for Everyone – Advanced Analytics and Graphics*" - Addison Wesley Data and Analytics Series, Pearson Education.

**REFERENCE**

1. Notman Matloff (2009), "The Art of R Programming – O-Relly

**LIST OF EXPERIMENTS**

1. Generation of Fibonacci Series
2. Programming Using Vectors
3. Find the list of random Numbers in Normal Distribution
4. Read the .csv file and display the contents
5. Matrix Manipulations using R Programming
6. Drawing Graphs
7. Drawing Plots
8. Creating Data Frames
9. Sorting of given data frame by multiple columns
10. Comparision of two data frames

Any Program Using R Programming based on syllabus can be included.

| Course Nature: Theory-Cum-Practical | | | | | | |
|---|---|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | | | |
| In Semester | Assessment Tool | Practical exercises -I | | Practical exercises -II | | Total |
| | | Theory | Practical | Theory | Practical | |
| | | 10 | 5 | 10 | 5 | |
| | Total | **15** | | **15** | | **30** |
| End Semester | Marks | Theory | | | Practical | **70** |
| | | **40** | | | **30** | |
| | | | | | **Total** | **100** |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2256** | **CLOUD OMPUTING** | **0** | **2** | **2** | **4** | **3** |

| **INSTRUCTIONAL OBJECTIVES** At the end of this course the learner is expected: | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| 1. | To understand the basic concepts on cloud computing. | c | | | | |
| 2. | To attain the knowledge on the reason for migration on cloud | b | d | | | |
| 3. | To acquire the clear idea about the working principles of cloud computing. | | d | | | |

**UNIT I - CLOUD COMPUTING BASICS**

Cloud Computing Overview- Applications – Intranets and the cloud – Why Cloud Computing Matters – Benefits – Limitations – Companies in the Cloud Today – Cloud Services.

**UNIT II - CLOUD COMPUTING TECHNOLOGY**

Hardware and Infrastructure – Clients – Security- Network – Services – Accessing the Cloud - Platforms – Web Applications – Web APIs –Web Browsers –Cloud Storage – Overview – Cloud Storage Providers –Standards – Application – Client – Infrastructure – Service.

**UNIT III - CLOUD COMPUTING AT WORK**

Software as a service – Overview – Driving Forces – Company offerings – Industries

Software plus Services – Overview - Mobile Device Integration –Providers – Microsoft Online.

**UNIT IV - DEVELOPING APPLICATIONS**

Google – Microsoft – Intuit Quick Base – Cast Iron Cloud – Bungee Connect - Local clouds and Thin Clients – Virtualization – Server Solutions – Thin Clients.

**UNIT V - MIGRATING TO THE CLOUD**

Cloud Services for Individuals – Cloud services aimed at the mid-market –Enterprise- Class Cloud Offerings – Migration.

TEXT BOOK

1.Velte T. Antony, Velte J. Toby. and Elsen Peter Robert (2010), “Cloud Computing: A Practical Approach”, Tata McGraw- Hill

**REFERENCES**

1. Miller Michael (2008), “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”, Que Publishing.

2. Beard Haley (2008), “Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs”, Emereo Pvt. Limited.

<table>
<tr><td colspan="7">Course Nature: Theory-Cum-Practical</td></tr>
<tr><td colspan="7">Assessment Method(Maximum marks)</td></tr>
<tr><td rowspan="3">In Semester</td><td rowspan="2">Assessment Tool</td><td colspan="2">Practical exercises -I</td><td colspan="2">Practical exercises -II</td><td rowspan="2">Total</td></tr>
<tr><td>Theory</td><td>Practical</td><td>Theory</td><td>Practical</td></tr>
<tr><td>10</td><td>5</td><td>10</td><td>5</td></tr>
<tr><td></td><td>Total</td><td colspan="2">15</td><td colspan="2">15</td><td>30</td></tr>
<tr><td rowspan="2">End Semester</td><td rowspan="2">Marks</td><td colspan="3">Theory</td><td>Practical</td><td rowspan="2">70</td></tr>
<tr><td colspan="3">40</td><td>30</td></tr>
<tr><td colspan="5"></td><td>Total</td><td>100</td></tr>
</table>

## SEMESTER VI

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| BCAD 2261 | OBJECT ORIENTED ANALYSIS AND DESIGN | 4 | 0 | 0 | 4 | 4 |

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| 1. | To ensure quality and reusability while developing software | c | | | | |
| 2. | To analyze and design the problem domain using unified Object approach | b | d | | | |
| 3. | To identify and categorize business, access and view layer objects of the application | | d | | | |
| 4. | To derive OOA & OOD phases using UML diagrams and CASE tools | | e | l | | |

**UNIT - I**

INTRODUCTION TO UML: Importance of Modeling - Principles of Modeling - Object Oriented Modeling - Conceptual Model of the UML- Architecture - Software Development Life Cycle.

**UNIT - II**

STRUCTURAL MODELING: Classes – Relationships – Common Mechanisms – Diagrams.

**UNIT - III**

CLASS & OBJECT DIAGRAMS: Terms – Concepts - Modeling Techniques for Class and Object Diagrams.

**UNIT - IV**

BEHAVIORAL MODELING: Interactions - Interaction Diagrams – Use cases – Use case Diagrams – Activity Diagrams.

**UNIT - V**

ARCHITECTURAL MODELING: Component – Deployment – Component Diagrams and Deployment Diagrams.

**TEXT BOOK**

1. Grady Booch, James Rumbaugh and Ivar Jacobson (2004). *"The Unified Modeling Language User Guide*". Addison Wesley Longman Pvt. Ltd., Singapore,

**REFERENCE**

1. Grady Booch, James Rumbaugh and Ivar Jacobson (2000), "*The Unified Modeling language Reference manual*". Addison Wesley Longman Pvt. Ltd., Singapore,

| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2262** | **COMPUTER NETWORKS** | **4** | **0** | **0** | **4** | **4** |

| **INSTRUCTIONAL OBJECTIVES** At the end of this course the learner is expected: | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| **1.** | To gain knowledge about the networks | **a** | | | | |
| **2.** | To have clear understanding about the Network programming | **a** | **c** | **e** | | |

**UNIT - I**

History and Need for Networking - Service Description – Connectionless and Connection-Oriented Services – Circuit and Packet Switching – Access Networks and Physical Media – Wireless Links and Characteristics – OSI Reference Model - Service Models –Ad-hoc network, GPS, Sensor network.

**UNIT - II**

Principles of Network Applications – The Web and HTTP – FTP – Electronic Mail – SMTP – Mail Message Formats and MIME – DNS –

Socket Programming with TCP and UDP. Multimedia Networking: Internet Telephony – RTP – RTCP – RTSP. Network Security: Principles of Cryptography – Firewalls – Application Gateway – Attacks and Counter measures.

**UNIT - III**

Transport Layer Services – Multiplexing and Demultiplexing – UDP – Reliable Data Transfer – Go-Back-N and Selective Repeat. Connection-Oriented Transport: TCP – Segment Structure – RTT estimation – Flow Control – Connection Management – Congestion Control – TCP Delay Modeling – SSL and TLS. Integrated and Differentiated Services: Intserv – Diffserv.

**UNIT – IV**

Forwarding and Routing – Network Service Models – Virtual Circuit and Datagram Networks – Router – Internet Protocol (IP) – IPv4 and IPv6 – ICMP – Link State Routing – Distance Vector Routing – Mobile IP

**UNIT – V**

Layer Services – Error Detection and Correction Techniques – Multiple Access Protocols – Link Layer Addressing – ARP – DHCP – Ethernet – Hubs, Bridges, and Switches –PPP. Ring Topology - Physical Ring – Logical Ring.

**TEXT BOOK**

1. James F. Kurose and Keith W. Ross (2006), "Computer Networking: A Top-Down Approach Featuring the Internet", Pearson Education, 3rd edition,.

**REFERENCES**

1. Andrew S. Tanenbaum (2003), "*Computer Networks*", Prentice-Hall of India, 4th edition.
2. Larry L. Peterson and Bruce S. Davie (2007), "*Computer Networks: A Systems Approach*", Elsevier, 4th edition.

| **Course Nature: Theory** | | | | |
|---|---|---|---|---|
| Assessment Method(Maximum marks) | | | | |
| In Semester | Assessment Tool | Assignment I | Assignment II | Total |
| | Marks | 15 | 15 | 30 |
| End Semester | | | | 70 |
| Total | | | | 100 |

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| BCAD 2263 | OBJECT ORIENTED ANALYSIS AND DESIGN LABORATORY | 0 | 0 | 4 | 4 | 2 |

| INSTRUCTIONAL OBJECTIVES<br>At the end of this course the learner is expected: | | Student Outcomes | | | | |
|---|---|---|---|---|---|---|
| 1. | To acquire basic knowledge about OOAD | a | b | | | |
| 2. | To develop the skills in spplying the tools for solving basic problems | | | c | e | |

**LIST OF EXPERIMENTS**

**PART I – To Familiarize with CASE tools using ATM system as specification.**

1. Introduction and project definition
2. Software process overview
3. Project planning
4. Software requirements and RequisitePro
5. Introduction to UML and use case diagrams
6. System modeling (DFD and ER)
7. Flow of events and activity diagram
8. OO analysis: discovering classes
9. Interaction diagrams: sequence and collaboration diagrams
10. Software Design: software architecture and object-oriented design
11. State Transition Diagram
12. Component and deployment diagrams
13. Software testing
14. Presentations.

**PART II - Design a project using CASE tools**
Students are divided into batches of 5 each and each batch has to draw the following diagrams using UML for given different case studies for each batch.
UML diagrams to be developed are:
1. Use Case Diagram.
2. Class Diagram.
3. Sequence Diagram.
4. Collaboration Diagram.
5. State Diagram
6. Activity Diagram.
7. Component Diagram
8. Deployment Diagram.

<table>
<tr><td colspan="6">Course Nature: Practical</td></tr>
<tr><td colspan="6">Assessment Method(Maximum marks)</td></tr>
<tr><td rowspan="2">In Semester</td><td rowspan="3">Assessment Tool</td><td>Practical exercises -I</td><td>Practical exercises -II</td><td>Practical exercises -III</td><td>Total</td></tr>
<tr><td>10</td><td>10</td><td>10</td><td>30</td></tr>
<tr><td>End Semester</td><td colspan="3">Practicals</td><td>70</td></tr>
<tr><td colspan="5">Total</td><td>100</td></tr>
</table>

| Course Code | Course Title | L | T | P | L+T+P | C |
|---|---|---|---|---|---|---|
| **BCAD 2264** | **PROJECT WORK** | **0** | **2** | **8** | **10** | **6** |
| **Students can choose problems of their own interest to develop software package using the programming languages/tools available. There will be two reviews conducted during the project period for all the students .At the end of the project, every student shall submit a structured project report.** | | | | | | |

| **INSTRUCTIONAL OBJECTIVES** At the end of this course the learner is expected: | | **Student Outcomes** | | | | |
|---|---|---|---|---|---|---|
| 1. | To conceptualize a novel idea / technique into a product | **c** | | | | |
| 2. | To think in terms of multi-disciplinary environment | | **d** | | | |
| 3. | To understand the management techniques of implementing a project | | | | **k** | |
| 4. | To take on the challenges of teamwork, prepare a presentation in a professional manner, and document all aspects of design work. | | | **g** | | |

| Course Nature: Project | | | |
|---|---|---|---|
| **Review of Report** | | **Dissertation & Viva voce** | |
| **Component** | **Marks** | **Component** | **Marks** |
| First Review | 15 | Presentation | 10 |
| Second Review | 15 | Analysis | 20 |
| | | Finding and Conclusion | 20 |
| | | Viva voce | 20 |
| **Total** | **30** | **Total** | **70** |