# BACHELOR OF COMPUTER APPLICATIONS
# REGULATIONS

## ELIGIBILITY

A pass in Higher Secondary Examination with any Academic stream or Vocational stream with Computer Science as one of the subject and as per the norms set by the Government of Tamil Nadu or an Examination accepted as equivalent thereto by the Academic Council, subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the **Bachelor of Computer Applications Degree Examination** of this College after a course of study of three academic years.

## OBJECTIVE OF THE COURSE

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. The BCA is catering to the needs of the students aspiring to excel in the fields of computers.
2. Carrying out the required analysis and synthesis involved in computer systems, information systems and computer applications.
3. Demonstrating professional competence in developing software in its design and implementation.
4. To Train and equip the students to meet the requirement of the corporate.
5. To stimulate an interest in computing as an academic discipline with a view to encourage progression to research.

## SCHEME OF EXAMINATION

| Course | Subject | Hrs of Instruction | Exam Duration (Hrs) | Max Marks | | | Credit Points |
|---|---|---|---|---|---|---|---|
| | | | | CA | CE | Total | |
| **First Semester** | | | | | | | |
| **PART I** | | | | | | | |
| 15UTL11T<br>15UHL11H<br>15UML11M<br>15UFL11F | Tamil-I/<br>Hindi-I/<br>Malayalam-I/<br>French – I | 6 | 3 | 25 | 75 | 100 | 4 |
| **Part - II** | | | | | | | |
| 15UEG12E | English - I | 6 | 3 | 25 | 75 | 100 | 4 |
| **Part - III** | | | | | | | |
| 15UCA13A | Core -I: C Programming | 4 | 3 | 25 | 75 | 100 | 4 |
| 15UCA13B | Core- II: Digital Fundamentals and Architecture | 4 | 3 | 25 | 75 | 100 | 4 |
| 15UMA1AB | Allied- I: Mathematical Structures for Computer Science | 5 | 3 | 25 | 75 | 100 | 4 |
| 15UCA13P | Core Lab– I: Programming in C | 3 | 3 | 40 | 60 | 100 | 4 |
| **Part - IV** | | | | | | | |
| 15UFC1FA | Foundation Course - I :Environmental Studies | 2 | 3 | — | 50 | 50 | 2 |
| | | **30** | | | | **650** | **26** |
| **Second Semester** | | | | | | | |
| **Part - I** | | | | | | | |
| 15UTL21T<br>15UHL21H<br>15UML21M<br>15UFL21F | Tamil-II<br>Hindi-II<br>Malayalam-II<br>French – II | 6 | 3 | 25 | 75 | 100 | 4 |
| **Part - II** | | | | | | | |
| 15UEG22E | English - II | 6 | 3 | 25 | 75 | 100 | 4 |

12/7/2016
BoS Chairman/HoD
Department of Computer Applications
Dr. G. R. Arts and Science College
Coimbatore – 641 048

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Part - III** | | | | | | | |
| 15UCA23A | Core- III: C++ Programming | 5 | 3 | 25 | 75 | 100 | 4 |
| 15UMA2AB | Allied- II: Discrete Mathematics | 5 | 3 | 25 | 75 | 100 | 4 |
| 15UCA23P | Core Lab - II : Programming in C++ | 4 | 3 | 40 | 60 | 100 | 4 |
| 15UCA23Q | Core Lab- III : Internet and Office Automation | 2 | 3 | 20 | 30 | 50 | 2 |
| **Part - IV** | | | | | | | |
| 15UFC2FA | Value Education: Human Rights | 2 | 3 | __ | 50 | 50 | 2 |
| | | **30** | | | | **600** | **24** |
| **Third Semester** | | | | | | | |
| **Part - III** | | | | | | | |
| 15UCA33A | Core- IV: Data Structures and Algorithms | 6 | 3 | 25 | 75 | 100 | 4 |
| 15UCA33B | Core- V: Java Programming | 6 | 3 | 25 | 75 | 100 | 4 |
| 15UMA3AB | Allied- III : Computer Based Optimization Techniques | 6 | 3 | 25 | 75 | 100 | 4 |
| 15UCA33P | Core Lab – IV: Programming in Java | 5 | 3 | 40 | 60 | 100 | 4 |
| **Part - IV** | | | | | | | |
| 15UCA3SA | Skill Based Subject- 1: Multimedia | 3 | 3 | 20 | 55 | 75 | 3 |
| 15UFC3FA 15UFC3FB 15UFC3FC 15UFC3FD 15UFC3FE | Tamil / Advanced Tamil (or)Yoga for Human Excellence/ Women's | 2 | 3 | - | 50 | 50 | 2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Rights /Constitution in India | | | | | | |
| 15UED34M | NMEC- I: | 2 | 3 | - | 50 | 50 | 2 |
| | | **30** | | | | **575** | **23** |
| **Fourth Semester** | | | | | | | |
| **Part - III** | | | | | | | |
| 15UCA43A | Core- VI: Operating Systems | 5 | 3 | 25 | 75 | 100 | 4 |
| 15UCA43B | Core -VII: Visual Basic and RDBMS | 6 | 3 | 25 | 75 | 100 | 4 |
| 15UPA4AC | Allied - IV: Business Accounting | 5 | 3 | 25 | 75 | 100 | 4 |
| 15UCA43P | Core Lab – V: Programming in VB and ORACLE | 6 | 3 | 40 | 60 | 100 | 4 |
| **Part - IV** | | | | | | | |
| 15UCA4SP | Skill Based Lab- 1: Multimedia | 4 | 3 | 30 | 45 | 75 | 3 |
| 15UFC4FA 15UFC4FB 15UFC4FC | Tamil/ Advanced Tamil (or) General Awareness | 2 | 3 | - | 50 | 50 | 2 |
| 15UED44M | NMEC II: | 2 | 3 | - | 50 | 50 | 2 |
| | | **30** | | | | **575** | **23** |
| **Fifth Semester** | | | | | | | |
| **Part - III** | | | | | | | |
| 15UCA53A | Core VIII: Data Communication and Networks | 6 | 3 | 25 | 75 | 100 | 4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15UCA53B | Core IX: Programming in Dot Net | 6 | 3 | 25 | 75 | 100 | 4 |
| 15UCA5EA<br>15UCA5EB<br>15UCA5EC | Elective I : | 6 | 3 | 25 | 75 | 100 | 4 |
| 15UCA53P | Core Lab – VI: Programming in Dot Net | 6 | 3 | 40 | 60 | 100 | 4 |
| **Part - IV** | | | | | | | |
| 15UCA5SA | Skill Based Subject-2: CASE Tools Concepts and Applications | 6 | 3 | 20 | 55 | 75 | 3 |
| | | **30** | | | | **475** | **19** |
| **Sixth Semester** | | | | | | | |
| **Part - III** | | | | | | | |
| 15UCA63A | Core- X: PHP and MYSQL | 5 | 3 | 25 | 75 | 100 | 4 |
| 15UCA63V | Core -XI: Project Work | 5 | 3 | 40 | 60 | 100 | 4 |
| 15UCA6EA<br>15UCA6EB<br>15UCA6EC | Elective- II : | 5 | 3 | 25 | 75 | 100 | 4 |
| 15UCA6ED<br>15UCA6EE<br>15UCA6EF | Elective- III: | 5 | 3 | 25 | 75 | 100 | 4 |
| 15UCA63P | Core Lab – VII: Programming in PHP and MYSQL | 5 | 3 | 40 | 60 | 100 | 4 |
| **Part-IV** | | | | | | | |
| 15UCA6SP | Skill Based Lab-2 : CASE Tools | 5 | 3 | 30 | 45 | 75 | 3 |
| **Part - V** | | | | | | | |
| 15UEX65A | Extension Activity | - | - | 50 | - | 50 | 2 |
| | | **30** | | | | **625** | **25** |
| **Grand Total** | | | | | | **3500** | **140** |

## ELECTIVE – I

(Student shall select any one of the following subject as Elective in fifth semester)

| S.No | Subject Code | Name of the Subject |
|---|---|---|
| 1. | 15UCA5EA | Web Technology |
| 2. | 15UCA5EB | Software Engineering |
| 3. | 15UCA5EC | Embedded System |

## ELECTIVE - II

(Student shall select any one of the following subject as Elective in sixth semester)

| S.No | Subject Code | Name of the Subject |
|---|---|---|
| 1. | 15UCA6EA | Cloud Computing |
| 2. | 15UCA6EB | Artificial Intelligence and Expert System |
| 3. | 15UCA6EC | Computer Graphics |

## ELECTIVE - III

(Student shall select any one of the following subject as Elective in sixth semester)

| S.No | Subject Code | Name of the Subject |
|---|---|---|
| 1. | 15UCA6ED | Data Mining |
| 2. | 15UCA6EE | Mobile Computing |
| 3. | 15UCA6EF | Digital Image Processing |

## NON MAJOR ELECTIVE COURSE

- The Department offers the following two papers as Non Major Elective Course for other than the Computer Science studies related students.

| S.No | Subject Code | Name of the Subject |
|---|---|---|
| 1 | 15UED34M | Security in Computing |
| 2 | 15UED44M | Big Data Analytics |

## FOR COURSE COMPLETION

Students has to complete the following subjects:

- Language papers (Tamil/Malayalam/French/Hindi, English) in I and II semester.
- Environmental Studies in I semester.
- Value Education in II and III semester respectively.
- General Awareness in IV semester.
- **A**llied papers in I, II, III and IV semesters.
- Non Major Elective Course in III and IV semester.
- Extension activity in VI semester.
- Elective papers in the V and VI sixth semesters.
- An in-house project at VI semester.

## Total Credit Distribution

| Subjects | Credits | Total | | Credits | Cumulative Total |
|---|---|---|---|---|---|
| **Part I:** Tamil | 4 | 2 x 100 | 200 | 08 | 16 |
| **Part II:** English | 4 | 2 x 100 | 200 | 08 | |
| **Part III:** | | | | | |
| Core | 4 | 13 x 100 | 1300 | 52 | 98 |
| Core Practical | 4 | 6 x 100 | 600 | 24 | |
| Core Practical | 2 | 1 x 50 = | 50 | 02 | |
| Project | 4 | 1 x 100= | 100 | 04 | |
| Allied Theory | 4 | 4 x 100= | 400 | 16 | |
| **Part IV:** | | | | | |
| Value Education | 2 | 2 x 50 = | 100 | 04 | 24 |
| Environmental Studies | 2 | 1 x 50 = | 50 | 02 | |
| General Awareness | 2 | 1 x 50 = | 50 | 02 | |
| Skill Based subjects | 3 | 4 x 75 = | 300 | 12 | |
| NMEC | 2 | 2 x 50 = | 100 | 04 | |
| **Part V:** | | | | | |
| Extension Activity | 2 | 1 x 50 = | 50 | 02 | 02 |
| **Total** | | | **3500** | **140** | **140** |

| 15UTL11T | பகுதி -1: தமிழ் தாள்-I | முதல் பருவம் |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 6**

**(ஓர் ஆண்டு தமிழ் பயிலும் மாணவர்களுக்கு உரியது)**

**முதல் ஆண்டு**

**இக்காலஇலக்கியம்- நீதி இலக்கியம் – சிற்றிலக்கியம்**

**அலகு-1 இக்காலஇலக்கியம் (கவிதை,சிறுகதை,உரைநடை)**

1. பாரதியார் – எங்கள் தாய்
2. பாரதிதாசன் – வாழ்வு
3. .மு.மேத்தா – மரங்கள்
4. . சிற்பி – சர்ப்பயாகம்
5. .சல்மா – விலகிப்போகும் வாழ்க்கை
6. ஜெயகாந்தன் – இனிப்பும் கரிப்பும்
7. அம்பை – வல்லூறுகள்
8. முனைவர் வ.சுப மாணிக்கம் – சங்க நெறிகள்
9. சோ.நா. கந்தசாமி - தமிழர் பண்பாடு - ஒரு விளக்கம்

**அலகு - 2 நீதி இலக்கியம்**

1. நாலடியார் - அறிவுடைமை (அதிகாரம்-25)
2. மூதுரை - 5 பாடல்கள் (பா.எண் : 6,16,17,23,26)
3. பழமொழி நானூறு - முயற்சி(10 பாடல்கள்)
4. நான்மணிக்கடிகை - 5 பாடல்கள் (பா.எண் :1,5,7,8,9)
5. திரிகடுகம் - 5 பாடல்கள் (பா.எண் :2,3,5,6,8)

**அலகு -3 சிற்றிலக்கியம்**

1. தமிழ் விடுதூது – தூதுப் பொருள்கள்(101-112)
2. திருக்குற்றாலக் குறவஞ்சி – குறத்தி மலைவளம் கூறுதல் (6பாடல்கள்)
3. முக்கூடற் பள்ளு – பள்ளியர் ஏசல் (161-175)
4. கலிங்கத்துப்பரணி – இந்திர சாலம் (154-178)
5. அபிராமி அந்தாதி –10 பாடல்கள் பாடல் எண்:

(2,4,6,11,20,26,63,69,71,82)

அலகு -4 இலக்கிய வரலாறு

1. தமிழ்க் கவிதையின் தோற்றமும் வளர்ச்சியும்
2. தமிழ் சிறுகதையின் தோற்றமும் வளர்ச்சியும்
3. தமிழ் உரைநடையின் தோற்றமும் வளர்ச்சியும்

அலகு - 5 இலக்கணம்

1. வல்லினம் மிகும் ,மிகா இடங்கள்
2. பெயர் ,வினை,இடை , உரிச் சொற்களின் பொது இலக்கணம்
3. பிறமொழிச்சொற்களைத் தமிழ்ச் சொற்களாக மாற்றுதல் (வடமொழி – தமிழ்,
   ஆங்கிலம் – தமிழ்)
4. பயிற்சிக்குரியன (கவிதை ,சிறுகதை,கட்டுரை படைத்தல்)

பார்வை நூல்கள்

1 . தமிழ்த்துறை வெளியீடு
2. இலக்கிய வரலாறு – பேராசிரியர் முனைவர் பாக்யமேரி

| 15UHL11H | PART-I: HINDI-I | SEMESTER- I |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 6**

**Prose, Non-detailed Text, Grammar and Translation Books Prescribed:**

**1. PROSE : Nuthan Gadya Sangrah**

Editor: Jayaprakash (Prescribed Lessons – only 4)

Lesson 1 - Razia
Lesson 2 – Makreal
Lesson3- Bahtha Pani Nirmala
Lesson 4 – Rashtrapitha Mahathma Gandhi

Publisher: Sumitra Prakashan Sumitravas,
16/4 Hastings Road,
Allahabad – 211 001.

**2. NON DETAILED TEXT: Kahani Kunj.**

**Editor:** Dr.V.P.Amithab. (Stories 1 -4 only)
Publisher : Govind Prakashan Sadhar Bagaar,
Mathura,
Uttar Pradesh – 281 001.

3. **GRAMMAR :** Shabdha Vichar ( Sangya, Sarvanam, Karak, Visheshan)
ONLY
(Noun, Pronoun, Adjective, Case Endings) Theoretical and Applied. Book for

**Reference :** Vyakaran Pradeep by Ramdev.
Publisher : Hindi Bhavan,
36,Tagore Town
Allahabad – 211 002.

4. **TRANSLATION:** English- Hindi only. Anuvadh Abhyas – III
(1-10 lessons Only)

**Publisher:** Dakshin Bharath Hindi Prachar Sabha
Chennai -17.

5. **COMPREHENSION :** 1 Passage from ANUVADH ABHYAS – III (16- 30) Dakshin bharath hindi prachar sabha Chennai- 17.

| 15UML11M | PART-I: MALAYALAM-I | SEMESTER-I |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 6**

**Paper I Prose, Composition and Translation**

This paper will have the following five units:

**Unit I &II** - Novel

**Unit III & IV** - Short story

**Unit V** **-** Composition and Translation

**TEXT BOOKS:**

Unit I &II - Naalukettu – M.T. Vasudevan Nair (D.C. Books, Kottayam, Kerala)

Unit III & IV - Manikkianum Mattu Prathana Kathakalum – Lalithampika Antharjanam (D.C.Books, Kottayam, Kerala)

Unit V - Expansion of ideas, General Essay and Translation of a simple passage from English about **100** words) to Malayalam

**REFERENCE BOOKS:**

1. Kavitha Sahithya Charitram –Dr. M.Leelavathi (Kerala Sahithya Academy, Trichur)
2. Malayala Novel Sahithya Charitram –K.M.Tharakan(N.B.S. Kottayam)
3. Malayala Nataka Sahithya Charitram-G.Sankarapillai(D.C.Books, Kottayam)
4. Cherukatha Innale Innu –M.Achuyuthan(D.C. Books, Kottayam)
5. Sahithya Charitram Prasthanangalilude-Dr. K.M. George,(Chief Editor)
   (D.C. Books, Kottayam)

| 15UFL11F | PART-I : FRENCH-I | SEMESTER- I |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 6**

## French Language for Under-graduate Degree Programmes

| Compétence Culturelle | Compétence De communication | Compétence grammaticale |
|---|---|---|
| **UNITÉ 1 – Ici, en France** | | |
| • Moi et les Autres<br>• La France Express | • INTERACTION: s'identifier<br>• RÉCEPTION ECRITE: Comprendre une annonce d'aeroport<br>• RÉCEPTION ORALE: comprendre l'ecrit de la rue (Panneaux, plaques, rues...)<br>• PRODUCTION ÉCRITE**:** écrire un SMS | • Le présent des verbes: Je suis, je reste,J'arrive<br>• Le lieu: (je suis) à… (je suis) ici<br>• L'infinitif |
| **UNITÉ 2 – Ici, en classe** | | |
| • Moi et le francais<br>• Le francais dane le monde | • INTERACTION: Se présenter<br>• RÉCEPTION ORALE: Comprendre des consignes Orales<br>• RÉCEPTION ÉCRITE: Comprendre une fiche D''inscription<br>• PRODUCTION ÉCRITE: écrire un texte à 'impératif | • Tu/vous<br>• Le present des Verbes en-er et de être:je, tu,vous<br>• La forme Impérative (tu ,vous) Des verbes en-er |
| **UNITÉ 3 - Samedi** | | |
| • Le fil du temps | • INTERACTION: S'informer<br>• RÉCEPTION ORALE: Comprendre une annonce<br>• RÉCEPTION ÉCRITE: Comprendre un article (titres et illustrations)<br>• PRODUCTION ÉCRITE: écrire des slogans | • Les articles Défines:le,la,les<br>• A,de+le,la,les: Au,aux,du,des,à l', de l'<br>• Être(présent)I'heure<br>• Ll faut+nom Ll faut+infinitive<br>• Pharses |

| | | |
|---|---|---|
| | | verbe+complément,<br>Complément+verbe |
| **UNITÉ 4 - Dimanche** | | |
| • Les activités Culturelles des Français | • INTERACTION: Acheter,demander des Informations<br>• RECEPTION ORALE: Comprendre les Titres du journal à la radio<br>• RÉCEPTION ÉCRITE: Comprendre les Informations<br>• PRODUCTION ÉCRITE: Inventer des noms de journaux | • Faire, present<br>• Avior, present<br>• Ll y a<br>• Le présent des verbes en-er: Regarder<br>• Combien?<br>• Quand?<br>• Complément de nom: Tremblement de terre, les noms de pays….<br>• Du,des,de la(reprise U2)<br>• Les adjectifs possessifs: Mon,ta,son, Ma,ta,sa Mes,tes,ses |
| **UNITÉ 5 – Dommage!** | | |
| • Un baby-boom en 2000 et 2001<br>• L'amour, toujours | • INTERACTION: exprimer la tristesse, la peur, conseiller,encourager<br>• RÉCEPTION ORALE: Comprendre une émission De radio<br>• RÉCEPTION ÉCRITE: Comprendre un sondage<br>• PRODUCTION ÉCRITE: écrire des blogs | • Est-ce que<br>• Le present des verbes pouvoir,Vouloir<br>• Le conditionnel des Verbs pouvoir, Vouloir<br>• Ne…pas |

**TEXT BOOK:**

1. *Marcella Di Giura Jean-Claude Beacco,* **Alors I.** Goyal Publishers Pvt Ltd 86, University Block Jawahar Nagar (Kamla Nagar) New Delhi – 11000

| 15UEG12E | PART – II: ENGLISH-I | SEMESTER-I |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 6**

**OBJECTIVES:**

1. To develop the language competence of the students.
2. To be enriched with functional English.

**UNIT-I: PROSE**

1. My Financial Career – Stephen Leacock
2. At School – Gandhi
3. Ecology – Barry Commoner

**UNIT-II: SHORT STORIES**

1. The Gateman's Gift – R.K. Narayan
2. The Open Window – H.H. Munro
3. The Face of Judas Iscariot – Bonnie Chamberlain

**UNIT-III: ONE ACT PLAY**

1. The Discovery – Herman Ould

**UNIT-IV: FUNCTIONAL GRAMMAR**

1. Vocabulary Exercises
2. Synonyms, Compound Words, etc
3. Communication Skills – Tasks
4. Different types of sentences
5. The Structure of Sentences
6. Transformation of Sentences

**UNIT-V: COMPOSITION TASKS**

1. Greeting, Introducing, Requesting, Inviting
2. Congratulating, Thanking, Apologising, Advice
3. Suggestions, Opinions, Permissions.
4. Comprehension

**TEXT BOOKS:**

1. *Seshasayee. N*. 2001**. Honeycomb.** Anu Chitra Publications, Chennai.
2. *Syamala***.** *V*. 2002. **Effective English Communication for You.** Emerald Publishers, Chennai.

**REFERENCE BOOKS:**

1. *Rajamanickam. A.* 2001**. Everyman's English Grammar,** MacMillan.
2. *Krishna Mohan and Meera Banerji.* 2005. **Developing Communication Skills**. MacMillan, Chennai.
3. *Wren,P.C. and H. Martin***.**1998**. High School English Grammar and Composition.** MacMillan.

| 15UCA13A | CORE- I: C PROGRAMMING | SEMESTER - I |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 4**

**OBJECTIVES:**

The subject aims to build the concepts regarding:

1. To develop problem-solving strategies, techniques and skills that can be applied to computers and problems in other areas
2. To help students develop the logic, ability to solve the problems efficiently using C programming.
3. To learn various concepts and techniques for problem solving and will implement those ideas using C programs.

**CONTENTS**

**UNIT- I**

Algorithms – Flow Charts - History of C - Character set - C tokens - Keywords and Identifiers - Constants - Variables - Data types - Declaration of variables - Assigning values to variables - Defining Symbolic Constants - Arithmetic, Relational, Logical, Assignment, Conditional, Bitwise, Special, Increment and Decrement operators - Arithmetic Expressions - Evaluation of expression - precedence of arithmetic operators - Type conversion in expression – operator precedence and associativity - Mathematical functions - Reading and Writing a character - Formatted input and output.

**UNIT- II**

Introduction – If, If….Else, nesting of If …Else statements- Else If ladder – The Switch statement, The ? : Operator – The Goto Statement. Decision Making and Looping: Introduction- While statement- do statement – for statement - jumps in loops.

**UNIT- III**

Arrays – Two–dimensional arrays, Multi-dimensional arrays, Dynamic arrays- Character Arrays and Strings - structure – array of structure – nested structure – union.

**UNIT- IV**

Introduction – Need and Elements of User-Defined Functions- Definition- Return Values and their types - Function Calls – Declarations – Category of Functions- Nesting of Functions - Recursion – Passing Arrays and Strings to Functions - The Scope, Visibility and Lifetime of Variables- Preprocessor.

**UNIT- V**

Introduction-Understanding pointers-Accessing the address of a variable- Declaration and Initialization of pointer Variable – Accessing a variable through its pointer-Chain of pointers- Pointer Expressions – Pointer Increments and Scale factor- Pointers and Arrays- Pointers and Strings – Array of pointers – Pointers as Function Arguments- Functions returning pointers – Pointers to Functions – Pointers and Structures. File Management in C.

**TEXT BOOKS:**

1. *Balagurusamy,E. 2012.* **Fundamentals of Computing and Programming**, *Tata Mcgraw-Hill. (UNIT I)*
2. *Balagurusamy,E. 2009.* **Programming in ANSI C** [Tenth Reprint 2009], Tata MCGRAW-HILL. (UNIT I to V)

**REFERENCE BOOKS:**

1. *Henry Mullish and Huubert L.Cooper. 1996.***The Sprit of C**, Jaico Publication House.
2. *Ashok N Kamthane,2002*. **Programming with ANSI and Turbo C**, Pearson Education Publication.

| 15UCA13B | CORE- II: DIGITAL FUNDAMENTALS AND ARCHITECTURE | SEMESTER - I |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 4**

**OBJECTIVES:**

The subject aims to build the concepts regarding:

1. On successful completion of this subject the students should have Knowledge on Digital circuits and components of computer.
2. To Understand the different types of sequential and combinational circuits
3. To understand the details of the ALU and Memory

**CONTENTS**

**UNIT- I**

Number System and Binary Codes: Decimal, Binary, Octal, Hexadecimal – Binary addition, Multiplication, Division – Floating point representation, Complements, BCD, Excess3, Gray Code. Digital Logic: the Basic Gates – NOR, NAND, XOR Gates. Arithmetic Circuits: Half adder, Full adder, Parallel binary adder, BCD adder, Half subtractor, Full subtractor, Parallel binary subtractor

**UNIT- II**

Combinational Logic Circuits: Boolean algebra – Karnaugh map – Canonical form – Construction and properties – Implicants – Don't care combinations - Product of sum, Sum of products, simplifications. Sequential circuits: Flip-Flops: RS, D, JK, and T - Multiplexers – Demultiplexers – Decoder- Encoder – shift registers - Counters.

**UNIT- III**

Central Processing Unit: General Register Organization. Stack Organization: Register Stack and Memory Stack – Reverse Polish Notations. Instruction Format: Three Address – Two Address – One Address – Zero Address – RISK Instructions. Program Control: Status Bit

Conditions – Conditional Branch Instructions – Subroutine Call and Return – Program Interrupt – Types of Interrupt.

**UNIT- IV**

Input – Output Organization: Input – output interface – I/O Bus and Interface – I/O Bus Versus Memory Bus – Isolated Versus Memory – Mapped I/O – Example of I/O Interface. Asynchronous data transfer: Strobe Control and Handshaking. Priority Interrupt: Daisy- Chaining Priority, Parallel Priority Interrupt. Direct Memory Access: DMA Controller, DMA Transfer. Input – Output Processor: CPU-IOP Communication.

**UNIT- V**

Memory Organization: Memory Hierarchy – Main Memory- Associative Memory: Hardware Organization, Match Logic, Read Operation, Write Operation. Cache Memory: Associative, Direct, Set-associative Mapping – Writing into Cache Initialization. Virtual Memory: Address Space and Memory Space, Address Mapping Using Pages, Associative Memory, Page Table, Page Replacement.

**TEXT BOOKS:**

1. *Albert Paul Malvino and Donald P Leach.* 1996. **Digital Principles And Applications**, [4th edition] Tata McGrawhill. (UNIT I to II)
2. *Morris Mano, M. 1998.* **Computer System Architecture** [12th Edition] Prentice-Hall of India Publications. (UNIT III to V)

**REFERENCE BOOKS:**

1. *Puri, V.K.,* 2007. **Digital Electronics Circuits and Systems** [14th Edition] Tata McGraw hill.
2. *Carter*,M., 2006. **Computer Architecture** [First edition] Schaum's Outline series, Tata McGraw hill.

| 15UMA1AB | ALLIED- I:MATHEMATICAL STRUCTURES FOR COMPUTER SCIENCE | SEMESTER - I |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 5**

**OBJECTIVES:**

The subject aims to build the concepts regarding:

1. On successful completion of this subject the students should have :- Understanding the concepts of mathematics-Learning applications of statistical and numerical methods for Computer Science

## CONTENTS

**UNIT- I**

Matrices – Introduction –Determination –Inverse of a matrix –Rank of a Matrix –Eigen value Problems.

**UNIT- II**

System of Simultaneous Linear algebraic Equation –Gauss elimination, Gauss Jordon, Gauss Seidal methods. The solution of Numerical Algebraic and Transcendental equation – Bisection method –Newton – Rapson method –false position method.

**UNIT- III**

Numerical Differentiations –Newton's forward Difference - Backward Difference –Stirling formula Numerical Integration – Trapezoidal Rule and Simpson's rule Numerical solutions of ordering differential Equations –Taylor series and Runge kutta method.

**UNIT- IV**

Measures of central tendency –Mean Median and Mode –Relationship among mean median and mode. Measures of dispersion –Range, quartile deviation, mean deviation and Standard deviation.

**UNIT- V**

Regression and Correlation –Types of relationship –Linear regression – Correlation Coefficient of correlation –Regression equation of variables – Discrete Probability distribution – Uniform, Binomial and poison Distribution

**TEXT BOOKS:**

1. *Venkataraman , M.K*. 2003. **Engineering Mathematics Volume II.** NPC (Unit I)
2. *Venkataraman, M.K*. 2004. **Numerical Methods in science and Engineering**. NPC, Revised Edition - (Unit II and III)
3. *Gupta, S.P. and Gupta, M.P* . 2002. **Business Statistics** . Sultan Chand and Sons (Unit IV and V)

**REFERENCE BOOKS:**

1. *Balagurusamy , E*. 2002.**Numerical methods**. Tata MC Graw Hill.
2. *Gupta, S C and Kapoor*, V. K. 2004, **Fundamental of Mathematical statistics**. Sultan Chand and Sons.

| 15UCA13P | CORE LAB- I: PROGRAMMING IN C | SEMESTER - I |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 3**

**OBJECTIVES:**

The subject aims to build the concepts regarding:

1. To learn/strengthen a programming language like C, to learn problem solving techniques.
2. To Know the various concepts using Conditional Statements, Looping Statements, Arrays and Pointers

**CONTENTS**

1. Program to find the sum, average, standard deviation for a given set of numbers.
2. Program to generate n prime numbers.
3. Program to generate Fibonacci series.
4. Program to print magic square of order n where n > 3 and n is odd.
5. Program to sort the given set of numbers in ascending order.
6. Program to check whether the given string is a palindrome or not using pointers.
7. Program to count the number of Vowels in the given sentence.
8. Program to find the factorial of a given number using recursive function.
9. Program to print the student's Mark sheet assuming roll no, name, and marks in 5 subjects in a structure. Create an array of structures and print the mark sheet in the university pattern.
10. Program for function using pointers to add two matrices and to return the resultant matrix to the calling function.
11. Program to receive two filenames as arguments and check whether the file contents are same or not. If same delete the second file.
12. Program to take a file as command line argument and copy it to another file. At the end of the second file write the total i)no of chars ii) no. of words and iii) no. of lines.

| | | |
|---|---|---|
| **15UTL21T** | **பகுதி – I: தமிழ் தாள்-II** | **இரண்டாம் பருவம்** |

**Total Credits: 4**
**Hours Per Week: 6**

**(ஓர் ஆண்டு தமிழ் பயிலும் மாணவர்களுக்கு உரியது)**

**முதல் ஆண்டு**

**சங்க இலக்கியம்- பக்தி இலக்கியம் – காப்பியம்**

**அலகு 1 சங்க இலக்கியம்**

1. நற்றிணை – பாடல் எண் : 210 (நெய்தல்) 'நெடியமொழிதலும் கடிய ஊர்தலும்'
2. குறுந்தொகை –பாடல் 2 , 3 (குறிஞ்சி) 'கொங்குதேர் வாழ்க்கை', 'நிலத்தினும் பெரிதே'
3. கலித்தொகை – பாடல் 16 நெய்தல்கலி - 'ஆற்றுதல் என்பது'
4. புற நானூறு – பாடல் 184, 312 'உற்றுழி உதவியும்', 'ஈன்று புறந்தருதல்'
5. ஐங்குறுநூறு – மருதம் முதல் 5 பாடல்கள் (வேட்கைப் பத்து )

**அலகு -2 காப்பியங்கள்**

1.சிலப்பதிகாரம் – வழக்குரை காதை
2.மணிமேகலை – ஆதிரை பிச்சையிட்ட காதை
3.சீவக சிந்தாமணி- நாமகள் இலம்பகம்( நாட்டு வளம் முதல் 20 பாடல்கள் )
4.கம்பராமாயணம் – வாலிவதைப் படலம் ( வாலி இராமனை வினவுதல்.பாடல் எண்கள் (4121 முதல் 4136 வரை)

**அலகு 3 பக்தி இலக்கியம்**

1. தேவாரம் – திருஞானசம்பந்தர் ( கோளறுபதிகம்)
2. திருப்பாவை –ஆண்டாள் (முதல் 15 பாடல்கள்)
3. தேம்பாவணி- காட்சிப்படலம் ( முதல் 15 பாடல்கள்)
4.சீறாப்புராணம் –மானுக்குப் பிணை நின்ற படலம்

**அலகு-4 இலக்கிய வரலாறு**

1.முச்சங்க வரலாறு

2.சங்க இலக்கிய வரலாறு

3.பக்தி இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்

4.காப்பியத்தின் தோற்றமும் வளர்ச்சியும்

**அலகு -5 இலக்கணம்**

1.எழுத்து, அசை, சீர், தளை, அடி, தொடை பொது இலக்கணம்

2.தொகை நிலைத் தொடர்கள்

**பார்வை நூல்கள் :**

1. தமிழ்த்துறை வெளியீடு
2. இலக்கிய வரலாறு – பேராசிரியர் முனைவர் பாக்யமேரி

| 15UHL21H | PART-I: HINDI-II | SEMESTER- II |
|---|---|---|

**Total Credits: 4**

**Hours Per Week:6**

(Modern Poetry, Novel, Translation and Letter Writing)

**1. Modern Poetry:** Shabari – By Naresh Mehtha

**Publishers:** Lokbharathi Prakashan I Floor,Duebari Building Mahathma Gandhi Marg, Allahabad -1.

**2. Novel**: Seva Sadhan – By Prem Chand

**Publisher:**

**3.Translation:**Hindi – English Only,
(anuvadh abyas – iii) lessons.1 – 10 only publisher: dakshin bharath hindi prachar sabha chennai – 600 017.

**4. Letter Writing:** (Leave letter, Job Application, Ordering books, Letter to Publisher, Personal letter)

| 15UML21M | PART-I: MALAYALAM-II | SEMESTER- II |
|---|---|---|

**Total Credits: 4**
**Hours Per Week:6**

**PAPER II PROSE: NON-FICTION**

This Paper will have the following five units:

**UNIT I & II**

Biography

**UNIT III, IV & V**

Travelogue

**TEXT BOOKS PRESCRIBED:**

Unit I & II *Changampuzha Krishna Pillai: Nakshatrangalude Snehabhajanam* –*M.K. Sanu* (D.C. Books, Kottayam)

Unit III, IV and V Kappirikalude Nattil – *S.K. Pottakkadu* (D.C. Books, Kottayam)

**REFERENCE BOOKS:**

1. Jeevacharitrasahithyam –Dr. K.M. George(N.B.S. Kottayam)
2. Jeevacharitrasahithyam malayalathil- Dr. Naduvattom Gopalakrishnan(Kerala Bhasha Institute, Trivandrum)
3. Athmakathasahithyam malayalathil –Dr. Vijayalam Jayakumar(N.B.S. Kottayam)
4. Sancharasahithyam Malayalathil-Prof.Ramesh Chandran. V,(Kerala Bhasha Institute, Trivandrum)

| 15UFL21F | PART-I: FRENCH-II | SEMESTER- II |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 6**

**French Language for Under-graduate Degree Programmes**

| Compétence Culturelle | Compétence De communication | Compétence grammaticale |
|---|---|---|
| **UNITÉ 6 – Super!** | | |
| • L'égalité homme/femme | • INTERACTION: Exprimer des sentiments, exprimer la joie, le plaisir, le bonheur<br>• RÉCEPTION ORALE: Comprendre un jeu radiophonique<br>• RÉCEPTION ÉCRITE: Comprendre des announces<br>• PRODUCTION ÉCRITE: Écrire des cartes postales | • Les noms de professions masculine/feminine<br>• Le verb finir et less Verbes du groupe en-ir<br>• Le present de l'impératif<br>• Savoir(present)<br>• Le participle passé: Fini, aimé, arrive, dit,écrit<br>• Quel(s), quelle(s)..: Interrogatif et Exclamatif<br>• À + infinitive<br>• Les articles: n,une,des |
| **UNITÉ 7 – Quoi?** | | |
| • Le 20 siécle: Petits progrés Grand progrés | • INTERACTION: Decrire quelque chose, une personne<br>• RECEPTION ORALE: Comprendre un message publicitaire<br>• RÉCEPTION ÉCRITE: Comprendre un dépliant touristique<br>• PRODUCTION ÉCRITE: Écrire des petites annonces | • On<br>• Plus, moins<br>• Le verbe aller:<br>• Present, impératif<br>• Aller + infinitife<br>• Le pluriel en –x |
| **UNITÉ 8 – Et aprés** | | |
| • Nouvelles du jour | • INTERACTION: Raconteur,situer un récit dans le temps<br>• RÉCEPTION ORALE: | • L'imparfait:: quel-Ques forms pour introduire le récit:Il faisait, il y avait, il |

| | | |
|---|---|---|
| | Comprendre une description<br>• RÉCEPTION ÉCRITE: Comprendre un test<br>• PRODUCTION ÉCRITE: écrire des cartes postales | Était<br>• Un peu, beaucoup, trop,Assez<br>• Trés<br>• Le verbe venir: Présent, impératif<br>• En Suisse, au Maroc, aux Etats-Unis |
| **UNITÉ 9 – Mais oui!** | | |
| • La génération des 20-30 ans | • INTERACTION: Donner son opinion, Expliquer pourquoi<br>• RÉCEPTION ORALE: Comprendre des informations à la radio<br>• RÉCEPTION ÉCRITE: Comprendre un texte informatif<br>• PRODUCTION ÉCRITE: éncrire un mél de protestation | • Répondre, prendre: Présent, impératif, part Passé<br>• Parce que pourquoi<br>• Tout/tous, toute/s Tous/toutes les… (répétition action) |
| **UNITÉ 10 – Mais non!** | | |
| • De la ville à la campagne | • INTERACTION: Débat:: exprimer l'accord, exprimer le Désaccord<br>• RECEPTION ORALE: Comprendre un message sur un répondeur téléphonique<br>• RÉCEPTION ÉCRITE: Comprendre un témoignage<br>• PRODUCTION ECRITE: Rediger des petites Announces immobilieres | • Le verbe devoir: Present et participe passé<br>• Le verbe vivre, present<br>• Aller + infinitive<br>• Venir+ infinitive<br>• Etre pour/contre |

**TEXT BOOK**:

1. *Marcella Di Giura Jean-Claude Beacco,* **Alors I.** Goyal Publishers Pvt Ltd 86, University Block Jawahar Nagar (Kamla Nagar) New Delhi – 110007.

| 15UEG22E | PART –II: ENGLISH-II | SEMESTER- II |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 6**

**OBJECTIVES:**

1. To develop the language competence of the students.
2. To be enriched with functional English.

**UNIT-I**

**PROSE**

1. Words of Wisdom – Chetan Bhagat
2. Forgetting – Robert Lynd
3. My Early Days – Dr. Abdul Kalam

**UNIT-II**

**SHORT STORIES**

1. Am I Blue? – Alice Walker
2. Last Leaf – O Henry
3. Selfish Giant – Oscar Wilde

**UNIT-III**

**ONE ACT PLAY**

1. Soul Gone Home - Langston Hughes

**UNIT-IV**

**FUNCTIONAL GRAMMAR**

1. Lexical Skills and Question Forms
2. Idioms and Phrases – Subject-Verb Agreement
3. Spelling, Antonyms and Synonyms, Infinitives
4. Vocabulary, Report Writing
5. Plurals, Particles in Adjectives
6. Apostrophe, Archaic Words, Art of Persuasion
7. Syllables, Changing Adjectives to Nouns
8. Homonyms, Prepositions
9. Compound Words, Acronyms, Collective Nouns, Degrees of Comparison

**UNIT-V**

**COMPOSITION TASKS**

1. Letter Writing - Structure
2. Business Correspondence – Memos, reports, proposals
3. Resume and C.V.
4. Advertisements
5. Notices, Agenda, Minutes
6. Circulars
7. Essay Writing
8. Précis Writing
9. Dialogue Writing
10. Soft Skills, Business English

**TEXT BOOKS:**

1. *Board of Editors.* 2012. **Radiance – English for Communication**, Emerald Publishers.
2. *Syamala, V*. 2002. **Effective English Communication for You**. Emerald Publisher, Chennai.

**REFERENCE BOOKS:**

1. *Rajamanickam. A.* 2001**. Everyman's English Grammar.** Macmillan.
2. *Krishna Mohan and Meera Banerji*. 2005. **Developing Communication Skills.** Macmillan, New Delhi.
3. *Wren,P.C. and H. Martin***.** 1998**. High School English Grammar and Composition.** Macmillan

| 15UCA23A | CORE- III: C++ PROGRAMMING | SEMESTER - II |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 5**

**OBJECTIVES:**

1. To understand Object Oriented Programming Paradigm
2. To inculcate knowledge on Object Oriented Concepts using C++
3. Subject also covers File Streams, Exception Handling and Templates

**CONTENTS**

**UNIT- I**

Introduction to C++ **-** key concepts of Object-Oriented Programming – Advantages- Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures : Decision Making and Statements : If .. else ,jump, goto, break, continue, Switch case statements - Loops in C++ : For, While, Do - Functions in C++ - Inline functions – Function Overloading.

**UNIT-II**

Classes and Objects: Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – Bit fields and classes – Constructor and destructor with static members.

**UNIT-III**

Operator Overloading: Overloading unary, binary operators – Overloading Friend functions – type conversion. Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchical, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.

**UNIT- IV**

Pointers – Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object – Binding , Polymorphism and Virtual Functions.

**UNIT-V**

Files – File stream classes – file modes – Sequential Read / Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling – String- Declaring and Initializing string objects – String Attributes – Miscellaneous functions.

**TEXT BOOKS:**

***1.*** *Ashok N Kamthane ,2003.* **Object -Oriented Programming with ANSI and Turbo C++**[First Edition] Pearson Education publication. (UNIT I to V)

**REFERENCE BOOKS:**

1. *Balagurusamy, E.2003.* **Object-Oriented Programming with C++** [2nd Edition] Tata Mc-Grawhill Publications.
2. *Maria Litvin and Gray Litvin , 2002*. **C++ for you** [2nd Edition] Vikas publication.
3. *John R Hubbard ,2002*. **Programming with C[**2nd Edition] Tata McGraw hill publication.

| 15UMA2AB | ALLIED- II: DISCRETE MATHEMATICS | SEMESTER - II |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 5**

**OBJECTIVES:**

On successful completion of this subject the students should have:

1. Understanding the concepts of discrete mathematics
2. Learning applications of discrete structures in Computer Science.

## CONTENTS

**UNIT-I**

Set theory-Introduction-Set and its Elements-Set Description-Types of sets-Venn-Euler diagrams-Set operations and Laws of set theory-Fundamental products-partitions of sets-minsets-Algebra of sets and Duality-Inclusion and Exclusion principle.

**UNIT- II**

Mathematical logic – Introduction-prepositional calculus – Basic logical operations-Tautologies - Contradiction- Argument- Method o f proof-Predicate calculus.

**UNIT- III**

Relations –Binary Relations –Set operation on relations-Types of Relations –Partial order elation –Equivalence relation –Composition of relations – Functions –Types of functions –Invertible functions –Composition of functions.

**UNIT- IV**

Languages–Operations on languages –Regular Expressions and regular languages –Grammar –Types of grammars –Finite state machine –Finite – State automata.

**UNIT- V**

Graph Theory –Basic terminology – paths, cycle and Connectivity – Sub graphs – Types of graphs –Representation of graphs in computer memory

-Trees –Properties of trees –Binary trees – traversing Binary trees – Computer Representation of general trees

**TEXT BOOKS:**

1. *Sharma, J.K, 2004*, **Discrete Mathematics,** Second Edition, Macmillan India Ltd. (UNIT I to V)

**REFERENCE BOOKS:**

1. *Tremblay,J.P and Manohar,R* , 2004**, Discrete Mathematics Structures with Applications to computer science,** McGraw Hill International Edition
2. *Venketaramen,M.K , Sridharan,N and Chandarasekaran,N,* 2002**,Discrete Mathematics** The National publishing Company Chennai.

| 15UCA23P | CORE LAB- II : PROGRAMMING IN C++ | SEMESTER - II |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 4**

**OBJECTIVES:**

1. To learn basic concepts of OOPS concepts
2. To solve problems of repetitive nature using loop structures
3. To implement data structure concepts in Object oriented programming

**CONTENTS**

1. Program for creating a class ARITHMETIC which consists of a FLOAT and an INTEGER variable. Write a Member function ADD (), SUB (), MUL (), DIV () to perform addition, subtraction, multiplication, division respectively. Write a member function to get and display values.
2. Program to find factorial of a given number using Copy constructor
3. Program to read an integer number and find the sum of all the digits until it reduces to a single digit using constructors, destructors and inline member functions.
4. Program for Banking Information system using FRIEND FUNCTION.
5. Program using Function Overloading to read two Matrices of different Data Types such as integers and floating point numbers. Find out the sum of the above two matrices separately and display the sum of these arrays individually.
6. Program to create a class STRING. Write a Member Function to initialize, get and display stings. Overload the Operator + to concatenate two Strings, == to compare two strings

7. Program to create class, which consists of STUDENT detail like St_Number, St_Name, Department, Mark. Write a member function to get and display them. Derive a class RESULT from the above class and write a member function to calculate TOTAL, PERCENTAGE, and GRADE. Display the result of the student depending on the grade using Multi Level Inheritance.
8. Program to create class which consists of EMPLOYEEE detail like E_Number,E_Name ,Department, Basic Salary and Grade. Write a member function to get and display them.Derive a class PAY from the above class and write a member function to calculate DA,HRA and PF depending on the grade using Multiple Inheritance.
9. Program to create a class SHAPE which consists of two VIRTUAL FUNCTIONS Calculate_Area() and Calculate_Perimeter() to calculate area and perimeter of various figures. Derive three classes SQUARE, RECTANGLE, TRIANGE from class Shape and Calculate Area and Perimeter of each class separately and display the result.
10. Program to perform Arithmetic operations using TEMPLATE.
11. Program to perform multiple catch statements.
12. Program to merge two files into a single file.

| 15UCA23Q | CORE LAB-III : INTERNET AND OFFICE AUTOMATION | SEMESTER - II |
|---|---|---|

**Total Credits: 2**
**Hours Per Week: 2**

**OBJECTIVES:**

1. To learn basic computer skills with Microsoft Word, Microsoft Excel, Microsoft PowerPoint and Microsoft Access.
2. To understand the internet concepts for e-learning, searching and mail conversation
3. To understand practical skills to handle Ms-office packages

**CONTENTS**

1. To create an email-id and perform
(a)compose mail with attachment
(b)send a mail
(c)forward a mail
(d)reply for a mail.
2. To upload your resume with any one job portal .
3. Create a resume and format using MS WORD.
4. Create a class time table using MS WORD.
5. Prepare mail merge for parent meeting using MS WORD.
6. Prepare Student mark sheet using MS EXCEL.
7. Create a chart for result analysis using MS EXCEL.
8. Prepare a mark list for following conditions using data filter and data sort in MS EXCEL

a) Prepare mark list in ascending order.
b) Average is greater than or equal to 60.
c) Average is between 50 and 60.
d) Average is below 40.

9. Design organizational chart for Arts and Science College using POWER POINT.
10. Create a power point presentation to advertise a product using Slide Transition and Custom animation.
11. Create a student's Mark sheet database using MS Access.
12. Create a employee pay roll database using MS Access.

| 15UCA33A | CORE -IV: DATA STRUCTURES AND ALGORITHMS | SEMESTER - III |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 6**

**OBJECTIVES:**

1. To understand and analyze algorithms
2. To learn fundamentals of linear and non-linear Data structures
3. To be familiar with searching and sorting

## CONTENTS

**UNIT- I**

**Introduction:** Introduction of Algorithms, Analyzing Algorithms. **Arrays**: Representation of Arrays, Array create, inset and delete of data elements **Stacks**: Evaluation of Expression -Infix to Postfix Conversion. **Queue**: Circular and Dequeue - Multiple Stacks and Queues.

**UNIT -II**

**Linked List:** Singly Linked List - Linked Stacks and Queues - Polynomial Addition - More on Linked Lists - Sparse Matrices - Doubly Linked List - Dynamic Storage Management - Garbage Collection and Compaction.

**UNIT -III**

**Trees:** Basic Terminology - Binary Trees - Binary Tree Representations - Binary Trees Traversal - Threaded Binary Trees - Binary Tree Representation of Trees - Counting Binary Trees. **Balanced Binary Tree**: AVL Tree, Red-Black-tree and B-tree.

**UNIT- IV**

**Graphs:** Terminology and Representations - Traversals, Connected Components and Spanning Trees- Shortest Paths and Transitive Closure

**Searching:** Linear and Binary Search. **Internal Sorting:** Insertion Sort - Quick Sort - 2 Way Merge Sort - Heap Sort - Shell Sort - Sorting on Several Keys.

**UNIT- V**

**Files**: Files, Queries and Sequential organizations - Index Techniques – Hashing Techniques-File Organizations. **Hash Tables**: Hashing Functions - Overflow Handling.

**TEXT BOOKS:**

1. *Lafore Robert* **Schaum's Outline of Data Structures with C++***[*2nd Edition*]* Tata McGraw-Hill Edition. (Unit I – Unit – III).
2. *Ellis Horowitz, Sartaj Shani*, "**Data and File Structures**", Galgotia Publication (Unit IV – Unit – V).

**REFERENCE BOOKS:**

1. *Ellis Horowitz, Sartaj Shani, Sanguthevar Rajasekaran*, "**Computer Algorithms**" Galgotia Publication.
2. Malik,D,S., 2003. **Data structures using C++** [1st Edition] Cengage learning
3. *Vaugha H.Patil, 2012*. **Data Structures Using C++** [1st Edition] Oxford Higher Education

| 15UCA33B | CORE -V: JAVA PROGRAMMING | SEMESTER - III |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 6**

**OBJECTIVES:**

1. To understand the principles of object oriented programming concepts using java.
2. Subject deals with basic programming Techniques in Core Java
3. Subject enables to create wide range of Applications and Applets using Java

## CONTENTS

**UNIT- I**

Java Evolution: History – Features – How java differ from c and c++? - Overview of Java: simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine. Constants, Variables, Data Types - Operators and Expressions – Decision Making and Branching: if, if..else, nested if, switch, ? : Operator - Decision Making and Looping: while, do, for – Jumps in Loops - Labeled Loops.

**UNIT- II**

Classes, Objects and Methods, Arrays, Strings and Vectors – Interfaces: Multiple Inheritance – Packages: Putting classes together – Multithreaded Programming.

**UNIT- III**

Managing Errors and Exceptions – Applet Programming :AWT classes, working with Frame windows, working with Graphics Buttons

**UNIT- IV**

Managing Input / Output Files in Java : Concepts of Streams- Stream Classes – Byte Stream classes – Character stream classes – Using streams – I/O Classes – File Class – I/O exceptions – Creation of files – Reading / Writing characters, Byte-Handling Primitive data Types – Random Access Files.

**UNIT- V**

Java Swing: Introducing swing- origins of swings, swings components(Jlabels, Jbuttons, Jcheckbox, Jtextfields, Jlists and Combo Boxes), creating a swing Applet, frames – RMI: Features of RMI-Simple client/server applications using RMI

**TEXT BOOKS:**

1. *Hebert Schildt*. **Java the Complete Reference** [Eighth Edition] Tata Mc-Grawhill (UNIT I to V)

**REFERENCE BOOKS:**

1. *Balagurusamy ,E.* **Programming with Java – A Primer** [Sixth Edition] Tata Mc-Grawhill
2. *Black book.* ***Java6 programming - Kogent solutions Inc****[2007 Edition]* Dreamtech press
3. *John R. Hubbard*.2009. **Programming with Java [** Second Edition] Tata Mc-Grawhill

| 15UMA3AB | ALLIED –III: COMPUTER BASED OPTIMIZATION TECHNIQUES | SEMESTER - III |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 6**

**OBJECTIVES:**

On successful completion of this subject the students should have:-

1. Understanding various mathematical applications in industries.
2. Decision making for real time environment.

## CONTENTS

**UNIT- I**

Linear Programming -Mathematical Model assumption of linear Programming –Graphical method -Principles of Simplex method, Big-M Method ,Duality, Dual simplex method.

**UNIT- II**

Transportation and assignment problem -Integer Programming Branch and Round Techniques -Assignment and Traveling Salesman Problem.

**UNIT- III**

Game Theory -Concept of Pure and Mixed Strategies –Solving 2 x 2 matrix with and without saddle point -n x 2 -2 x m games. Replacement models -Elementary replacement models -present value -rate of return -depreciation -Individual replacement –Group replacement.

**UNIT- IV (Derivations not included)**

Queuing Theory -definition of waiting line model Queue discipline -traffic intensity - poison arrival –Birth death process -Problem from single server: finite and infinite population model –Problems from multi server: finite and infinite population model.

**UNIT- V**

PERT and CPM -Network representation -backward pass -Forward pass -computation -Pert Network -Probability factor –updating and Crashing.

**TEXT BOOKS:**

1. *Manmohan, P.K. Gupta, and Kanthiswarup*. **1997. Operations Research,.** S. CHAND and SONS

**REFERENCE BOOKS**

***1.*** *Hamdy A Taha,* 2002. **Operations Research .** Pearson Education, 7th edition

2. *Gupta, P.K. and. Hira, D.S.* 2004. **Problems in Operations Research,** S.Chand Publication

| 15UCA33P | CORE LAB-IV: PROGRAMMING IN JAVA | SEMESTER - III |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 5**

**OBJECTIVES:**

1. To include knowledge on implementation of algorithm and key concepts using Java.
2. Design, write, and test a Java program to implement a solution to a given problem specification.
3. Understand the operation of common data structures and algorithms.

**CONTENTS**

1. Java Applications to extract a portion of a character string and print the Extracted string.
2. Program to implement the concept of Interfaces.
3. Program to create an Exception called payout-of-bounds and throw the exception.
4. Program to implement the concept of multi threading with the use of any three multiplication tables and assign three different priorities to them.
5. Program to draw several shapes in the created windows.
6. Program to create a frame with three text fields for name, age and qualification and a text field for multiple lines for address.
7. Program to create Menu Bars and pull down menus.
8. Program to create frames which respond to the mouse clicks. For each events with mouse such as mouse up, mouse down, etc., the corresponding message to be displayed.
9. Program to draw circle, square, ellipse and rectangle at the mouse click positions.
10. Program which open an existing file and append text to that file.
11. Program for adding combo boxes to a tool bar using swings.
12. RMI Program to send the request message from client to server.

| 15UCA3SA | SKILL BASED SUBJECT- I : MULTIMEDIA | SEMESTER - III |
|---|---|---|

**Total Credits: 3**

**Hours Per Week: 3**

**OBJECTIVES:**

1. To inculcate knowledge on Media, Text, Image, Audio, Video, Animation etc.
2. To design Graphical images using Image-Editing tools
3. To learn Capturing, Creating and Editing Audio and Video through external devices.

## CONTENTS

### UNIT- I

Introduction: Multimedia Presentation and Production – Characteristics of Multimedia Presentation – Multiple Media- Utilities of Multi-sensory Perception – Hardware and Software Requirements. Digital Representation: Analog Representation – Waves – Digital Representation – Need for Digital Representation – Analog to Digital Conversion – Digital to Analog Conversion. Text: Types of Text – Unicode Standard – Font – Insertion of Text – Text compression – File formats.

### UNIT- II

Image: Image Types – Seeing Color – Color Models – Basic Steps for Image Processing – Scanner – Digital Camera – Interface Standards – Specification of Digital Images –CMS – Device Independent Color Models – Image Processing software – File Formats – Image Output on Monitor and Printer.

### UNIT- III

Audio: Introduction – Acoustics – Nature of Sound Waves –Fundamental Characteristics of Sound – Microphone – Amplifier – Loudspeaker – Audio Mixer – Digital Audio – Synthesizers – MIDI – Basics of Staff Notation – Sound Card – Audio Transmission – Audio File formats and CODECs – Audio Recording Systems – Audio and Multimedia – Voice Recognition and Response - Audio Processing Software.

**UNIT- IV**

Video: Analog Video Camera – Transmission of Video Signals – Video Signal Formats – Television Broadcasting Standards – Digital Video – Digital Video Standards - PC Video – Video Recording Formats and Systems - Video File Formats and CODECs – Video Editing – Video Editing Software.

**UNIT- V**

Animation: Types of Animation – Computer Assisted Animation – Creating Movement – Principles of Animation – Some Techniques of Animation – Animation on the Web – Special Effects – Rendering Algorithms. Compression: MPEG-1 Audio – MPEG-1 Video - MPEG-2Audio – MPEG-2 Video.

**TEXT BOOKS:**

***1.*** *Ranjan Parekh , 2007.* **Principles of Multimedia** Tata Mc-Grawhill (UNIT I to V )

**REFERENCE BOOKS:**

1. *Tay Vaughan.2008.* **Multimedia: Making it Work** [7th edition], Tata McGraw hill.
2. *Vikas Gupta, 2007.* **Comdex Multimedia And Web Design** DreamTech press.

| 15UED34M | NMEC- I : SECURITY IN COMPUTING | SEMESTER -III |
|---|---|---|

**Total Credits: 2**

**Hours Per Week: 2**

**OBJECTIVES:**

1. To give more and more visibility to effect of computer security on our daily lives
2. To Entails serious risks to the privacy and integrity of our data
3. To mind all sorts of issues that refer to data protection and prevention of unauthorized access

**CONTENTS**

**UNIT - I**

Security Problem in Computing : What Does "Secure" Mean? - Attacks - The Meaning of Computer Security - Computer Criminals.

**UNIT -II**

Program Security: Secure Programs – Non malicious Program Errors - Viruses and Other Malicious Code.

**UNIT -III**

Protection in General - Purpose Operating Systems: Protected Objects and Methods of Protection - Memory and Address Protection - File Protection Mechanisms.

**UNIT -IV**

Database and Data Mining Security: Introduction to Databases - Security Requirements - Reliability and Integrity

**UNIT-V**

Security in Networks: Network Concepts - Threats in Networks Network Security Controls- Firewalls

**TEXT BOOKS:**

1. *Charles.P Pfleeger and Shari Lawrence Pfleeger.* **Security in Computing[ 4th Edition]** Eastern Economy Edition(UNIT I to V)

**REFERENCE BOOKS:**

1. *Brijendra Singh.* **Network security and Management** [ Second Edition] Eastern Economy Edition
2. *William stallings* ***.2004.*** **Network security essentials**[5th Indian Reprint] Pearson education

| 15UCA43A | CORE -VI: OPERATING SYSTEM | SEMESTER - IV |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 5**

**OBJECTIVES:**

1. To understand the basic concepts of Operating Systems.
2. To discuss the components and responsibilities of operating system.
3. To introduce the operating system as a resource manager for resources like memory, process, device, data and file.

## CONTENTS

### UNIT- I - OPERATING SYSTEM OVERVIEW:

Operating System Objectives and Functions – The Evolution of Operating Systems – Types of OS - Major Achievements – Latest version OS.

### UNIT- II - PROCESS MANAGEMENT:

What is a Process? – Evolution of Multiprogramming – Context Switching – Process States – Process State Transitions – PCB – Process Control – Scheduling – Types of Scheduler – Scheduling algorithms - Performance Criteria.

### UNIT III – CONCURRENCY:

Principles of concurrency – Mutual Exclusion – Semaphores – Message Passing – Readers/Writers Problem – Deadlock : Prevention – Avoidance – Detection – Recovery Procedures.

### UNIT- IV - MEMORY MANAGEMENT:

Introduction – Memory Partitioning - Contiguous and Non-contiguous Allocation - Paging – Segmentation –Virtual Memory: Basic Concepts and Mapping – Page Replacement Strategies

**UNIT- V - I/O MANAGEMENT:**

I/O Buffering – Disk Scheduling. **File Management:** File Organization – File Directories – File Sharing – Secondary Storage Management. **Distributed Processing:** Client/Server Computing – Distributed Message Passing- Remote Procedure Calls – Case study : Linux

**TEXT BOOKS:**

1. *William Stallings, 1995.* **Operating Systems** [2nd Edition], Prentice-Hall of India Publications. (Unit I to V).

**REFERNECE BOOKS:**

1. *Achyut S. Godbole, 1997.* **Operating Systems** [1st edition], Tata McGraw hill.
2. *Andrew S. Tanenbaum, 1997.* **Modern Operating Systems** [1st Edition], Prentice-Hall of India Publications.

| 15UCA43B | CORE-VII: VISUAL BASIC AND RDBMS | SEMESTER - IV |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 6**

**OBJECTIVES:**

1. To inculcate Knowledge in Visual Programming to design User Interface applications
2. To understand Relational Database Concepts to implement in real time applications
3. To understand importance of visual programming and database concepts

## CONTENTS

### UNIT- I

Introducing Visual Basic: What is VB? – Event and Event Procedures – Object related concepts –VB program Development Process- Logical Program Organization -VB Program Components – VB environment. Visual Basic Fundamentals: constants – Variables – Data Types and Declarations – Operators and Expressions - Program Comments. Branching and Looping: Branching, selection and looping statements.

### UNIT- II

Visual Basic control Fundamentals: Control tools – Control tool Categories – Working with Controls.Menus and Dialog Boxes: Building Drop-Down Menus – Accessing Menu from Keyboard – Menu Enhancements – Submenus – Pop-Up Menus – Dialog Boxes – MsgBox Function – The Input Box function.

### UNIT- III

Arrays: Characteristics – Declarations –Processing – Passing Arrays to Procedures – Dynamic Arrays – Array-related Functions – Control Arrays – Looping with for Each-Next. Procedures: Modules and Procedures – Sub Procedures – Event Procedures – Function Procedures – Scope – Optional Arguments. Data Files: Sequential Data Files – Accessing files.

**UNIT- IV**

Database Concepts: A Relational approach: Database – Relationships – DBMS – Relational Data Model – Integrity Rules –Database Design: Data Modeling and Normalization: Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams – De –normalization- DDL- DML – Functions and Grouping- Multiple Tables-Joins and Set operations.

**UNIT- V**

PL/SQL: A Programming Language: Block Structure –Data Types – Declaration – Operators. Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit and Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables. Named Blocks: Procedures – Functions – Packages –Triggers.

**TEXT BOOKS:**

1. *Byron S. Gottfried* , 2002. **Visual Basic – Schaum'S Outline Series**[1st Edition] Tata McGraw hill. (UNIT I to III)
2. *Nilesh Shah*, 2008. **Database Systems Using Oracle** [2nd Edition] Prentice-Hall of India Publications. (UNIT IV to V)

**REFERENCE BOOKS:**

1. *Eric A Smith and Valor Whisher and Hank Marquis*. 1998. **Visual Basic 6 Programming Bible**[Illustrated Edition] Wiley.
2. *Cornell.*1999 **Visual Basic 6 From the Ground Up**, Tata McGraw hill Company Ltd, Ediion.
3. *Oracle Press*. 2002. **Oracle 9i: A Beginener's Guide**[Eleventh Reprint ] Tata McGraw hill

| 15UPA4AC | ALLIED- IV: BUSINESS ACCOUNTING | SEMESTER - IV |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 5**

**Note: Distribution of Marks between problems and theory shall be 80% and 20%.**

**OBJECTIVES:**

The subject aims to build the concepts regarding:

1. To understood the Concepts and conventions of Accounting and Basic Accounting framework.
2. Prepare financial statement analysis to evaluate the financial performance of a company.

**CONTENTS**

**UNIT- I**

Fundamentals of Book Keeping: Definition, objectives, methods of accounting, Branches of accounting, Types of Accounts and Accounting rules – Accounting Concepts and Conventions – Journal – Ledger – Subsidiary books: Purchases Book, Sales Book, Purchases Returns, Sales Return book, Cash Book (Single Column, Double Column and Triple Column) - Trial balance.

**UNIT – II**

Final accounts of a sole trader with adjustments: Trading Account, Profit and loss account, Balance Sheet, Adjustments

**UNIT - III**

Accounting for consignments and Joint ventures: Consignment Meaning, definition, features, account sales, valuation of unsold stock, goods sent on consignment at cost price and invoice price, various commission to consignee.(problems)

Joint venture: Meaning, features, distinction between joint venture and partnership, joint venture and consignment, accounting treatment for joint venture(only theory)

**UNIT – V**

Depreciation - Meaning- Features- Methods- Straight Line Method– WDV Method - Annuity Method.

**TEXT BOOKS:**

1. *Vinayakam N., Mani P.L., and Nagarajan K.L*, 2003, ***Principles of Accountancy*** , S.Chand and Company Ltd., New Delhi
2. *Jain S P and Narang K L,* 2000, **Advanced Accountancy**, Kalyani publishers, New Delhi.

**REFERENCE BOOKS:**

1. *Gupta R.L., Gupta V.K. and Shukla M.C.,* 2006, **Financial Accounting**, Sultan chand and sons, New Delhi.
2. *Maheswari S.K., and Reddy T.S.,* 2005, **Advanced Accountancy**, Vikas publishers, New Delhi.

| 15UCA43P | CORE LAB- V: PROGRAMMING IN VB AND ORACLE | SEMESTER – IV |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 6**

**OBJECTIVES:**

1. To impart knowledge on Visual Basic and RDBMS
2. To learn the practical skills of Visual basic to implement real time applications
3. To understand the data base concepts using Oracle
4. To learn the knowledge on VB and oracle to access both front-end and back end applications

**CONTENTS**

**VISUAL BASIC:**

1. Program to accept a number as input and convert them into
a. Binary b. Octal c. Hexa-decimal
2. Program to add the items to list box with user input and move the selected item to combo box one by one.
3. Program to develop a calculator with basic operation.
4. Designing a form using common dialog control to display the font, save and open dialog box without using the action control property.
5. Simple program to prepare a Questionnaire.
6. Program to develop a menu driven program
7. Developing a Simple Project for Student Database Management System using VB as front end and ORACLE as back endend.

## ORACLE

1. Creating table for Employee details with Employee Number as primary key and following fields: Name, Designation, Gender, Age, Date of Joining and Salary. Insert at least ten rows and perform various queries using any one Comparison, Logical, Set, Sorting and Grouping operators.
2. Creating tables for library management system which demonstrate the use of primary key and foreign key. Master table should have the following fields: Accno, Title, Author and Rate. Transaction table should have the following fields: User id, Accno, Date of Issue and Date of Return. Create a Report(Select verb) with fields Accno, Title, Date of Issue for the given Date of Return with column formats.
3. PL/SQL to update the rate field by 20% more than the current rate in inventory table which has the following fields: Prono, ProName and Rate. After updating the table a new field (Alter) called for Number of item and place for values for the new field without using PL/SQL block.
4. PL/SQL to split the student table into two tables based on result (One table for "Pass" and another for "Fail"). Use cursor for handling records of student table. Assume necessary fields and create a student details table.
5. Creating database trigger to implement on master and transaction tables which are based on inventory management system for checking data validity. Assume the necessary fields for both tables.
6. PL/SQL to raise the following Exception in Bank Account Management table when deposit amount is zero.

| 15UCA4SP | SKILL BASED LAB- 1: MULTIMEDIA | SEMESTER - III |
|---|---|---|

**Total Credits: 3**
**Hours Per Week:4**

**OBJECTIVES:**

1. To learn the practical skills of Photoshop
2. To design innovative presentations using Photoshop
3. To learn animation and poster design techniques

**CONTENTS**

1. Working with Text, Images, and Links using Dreamweaver
2. Creating Styles and Layouts with CSS.
3. Working with Web Templates and Importing a Web Site.
4. Animating Plane flying in the Clouds using Photoshop.
5. Creating Plastic Surgery for Nose using Photoshop.
6. Creating Web Page using Photoshop.
7. Converting Black and White to Color Photo using Photoshop.
8. Animation (tweened, motion) Using Flash
9. Adding Action scripts Using Flash
10. Designing an advertisement using Flash.
11. Creating a Movie using Director
12. Creating a Play School Teaching Aid using Director

| 15UED44M | NMEC- II : BIG DATA ANALYTICS | SEMESTER - IV |
|---|---|---|

**Total Credits: 2**
**Hours Per Week: 2**

**OBJECTIVES:**

1. To explore the fundamental concepts of big data analytics
2. To learn to analyze the big data using intelligent techniques.
3. To understand the applications using Map Reduce Concepts.

## CONTENTS

**UNIT- I**

Introduction to Big Data Platform – Challenges of Conventional Systems - Intelligent data analysis – Nature of Data - Analytic Processes and Tools - Analysis vs. Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

**UNIT- II**

History of Hadoop- The Hadoop Distributed File System – Components of Hadoop- Analyzing the Data with Hadoop- Scaling Out

**UNIT- III**

Hadoop Streaming- Design of HDFS-Java interfaces to HDFS- Basics-Developing a Map Reduce Application-How Map Reduce Works

**UNIT - IV**

Hadoop Environment - Setting up a Hadoop Cluster - Cluster specification - Cluster Setup and Installation - Hadoop Configuration-Security in Hadoop.

**UNIT – V**

Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive - fundamentals of HBase and ZooKeeper.

**TEXT BOOKS:**

1. *Michael Berthold, David J. Hand,* 2007 . **Intelligent Data Analysis**, Springer,
2. *Tom White*. 2012 **Hadoop: The Definitive Guide** Third Edition, O'reilly Media,

**REFERENCE BOOKS:**

1. *Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulo.* 2012 **Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data**, McGraw hill Publishing.
2. *Bill Franks.* 2012 **Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics,** John Wiley and Sons.

| 15UCA53A | CORE-VIII: DATA COMMUNICATION AND NETWORKS | SEMESTER - V |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 6**

**OBJECTIVES:**

1. To study about the physical arrangement of networks, types and modes of networks.
2. To understand the concepts of LANs, MANs, and WANs; internetworking.
3. To learn the concepts of Data transmission, data security mechanisms

## CONTENTS

### UNIT- I

Introduction: Networks – Protocols and standards – Standards organizations – Line configurations – Topology – Transmission mode – Categories of networks – Inter networks. OSI model: Functions of the layers. Transmission media: Guided media – Unguided media – Transmission - impairment – Performance.

### UNIT- II

Error detection and correction: Types of errors – Detection –Cyclic Redundancy Check (CRC) – Check sum – Error correction. Data link control: Flow control – Error control. Data link protocols: Asynchronous protocols – Synchronous protocols

### UNIT- III

LAN: IEEE 802 – Ethernet – Token bus – Token ring – FDDI.MAN: IEEE 802.6 (DQDB) – SMDS. Switching: Circuit switching – Packet switching – Message switching.

**UNIT- IV**

X.25: X.25 Layers- Frame relay: Introduction – Frame relay operation – Frame relay layers – Congestion control – Leaky bucket algorithm – Traffic control. ATM: Design goals – ATM architecture – ATM layers – ATM applications. SONET / SDH: Synchronous transport signals – Physical configuration – SONET layers – Applications.

**UNIT- V**

Networking and internetworking devices: Repeaters – Bridges – Gateways – Other devices – Routing algorithms – Distance vector routing – Link state routing.TCP / IP protocol suite: Overview of TCP/IP. Network layers: Addressing – Subneting – Other protocols and network layers. Application layer: Domain Name System (DNS) – Telnet – File Transfer Protocol (FTP) – Trivial File Transfer Protocol (TFTP) – Simple Mail Transfer Protocol (SMTP) – Simple Network Management Protocol.

**TEXT BOOKS:**

1. *Behrouz A.Forouzan. 2008*. **Data Communication and Networking**, [4th Edition], Tata McGrawHill.
2. *William Stallings. 2003*. **Data and Request Communication** [8th Edition] Pearson Education, Prentice-Hall of India Publications.

**REERENCE BOOKS:**

1. *Andrew Tannenbaum.S*.2000. **Computer Networks**, Prentice-Hall of India Publications.
2. *Achyut S.Godbole.2007.* **Data Communication and Networks** [8th Edition] Tata McGraw hill

| 15UCA53B | CORE -IX: PROGRAMMING IN DOT NET | SEMESTER - V |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 6**

**OBJECTIVES:**

1. To enable the students to acquire basic knowledge in Dot net Programming.
2. To understand the goals and objectives of the .NET Framework.
3. To get basic knowledge and programming skill of the Dot NET Framework C# programming language.

## CONTENTS

**UNIT- I**

**Understanding .NET**: The .NET Strategy – Origin of .NET technology – The .NET Framework – Common Language Runtime - .NET Languages – Benefits of .NET approach. Building C# 2005 applications - Visual C# Integrated Development Environment.
**Introducing C#:** What is C#? – Why C#? - Evolution of C# - Characteristics of C# - Applications of C# - Namespaces-Comments-Literals, Variables and Data Types-Operators and Expressions.

**UNIT- II**

Decision Making and Branching - Decision Making and Looping - Arrays and Strings. **Structures and Enumerators:** Structures – Structs with methods – Structs vs classes – Enumerations – Enumerator Initialization – **Classes and Objects**: Defining a class, Adding Variables and Methods, access modifiers, creating objects, Accessing class members. Constructors - overloaded constructor-copy constructor-private constructor-destructors. Static members and Static constructors. Method declaration – The main method – invoking methods – method parameters – pass by value, reference – Output Parameters – Variable argument list - Properties and Indexers.

**UNIT -III**

**Inheritance and Polymorphism**: Types of inheritance - Defining a subclass – visibility control – defining subclass constructors – Overriding Methods – Overloading methods. **Interface**: Defining an Interface – extending and implementing an interface. **Operator Overloading**: operator overloading – overloading unary operators – overloading binary operators.

**UNIT-IV**

Delegates and Events – **Managing Errors and Exceptions:** Types of errors – Exceptions – syntax of exception handling code – multiple catch statements - throwing own exceptions. **Web Forms in C#** - Buttons – Labels – Literals – File Upload - Place holders – Check box – Radio buttons – Tables – Panels – Images – Image Buttons – Image Maps – List boxes – Drop-down list – hyperlinks – link buttons – Tree view – Menu – Validation Controls – Validation Groups

**UNIT- V**

**Window Forms and Web-based Application Development on .NET:** Creating Window Forms – Customizing a Form – Creating and running a sample WinApp Windows Application – Overview of Design Patterns – Web-based application on .NET.

**TEXT BOOKS:**

1. *Balagurusamy, E.* 1999. **Programming in C# A Primer**, [ III Edition], Tata McGraw Hill.
2. *Matt Telles* **.2008C# 2005 Programming - Black Book** dreamtech press.

**REFERENCE BOOKS:**

1. *Art Gittleman.2008***. C#.Net Illustrated** Viva Bark Pvt Ltd
2. *Geff Ferguson .2007.* **C# Programming Bible**[1st Edition] Willy India

| 15UCA5EA | ELECTIVE- I: WEB TECHNOLOGY | SEMESTER - V |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 6**

**OBJECTIVES:**

1. To inculcate knowledge web technology concepts and functioning of internet
2. To get proficient in WEB Development using HTML/XML
3. To be able to write server and client scripts
4. To get proficient in Web Management

## CONTENTS

### UNIT -I

TCP/IP: TCP/IP Basics – Why IP address – Logical Address - TCP/IP Example- The concept of IP address – Basics of TCP – Features of TCP – Relationship between TCP and IP – Ports and Sockets – Active Open and Passive Open - TCP Connections – What makes TCP reliable? – TCP Packet format - Persistent TCP connections – UDP – Differences between TCP and UDP.

### UNIT- II

DNS – E-mail – FTP – TFTP – History of WWW – Basics of WWW and Browsing - Local information on the internet – HTML – Web Browser Architecture – Web Pages and Multimedia – Remote Login (TELNET).

### UNIT- III

Introduction to Web Technology: Web pages – Tiers – Concept of a Tier – Comparison of Microsoft and Java Technologies – Web Pages – Static Web Pages – Plug-ins – Frames – Forms. Dynamic Web Pages: Need – Magic of Dynamic Web Pages – Overview of Dynamic Web Page Technologies – Overview of DHTML – Common Gateway Interface – ASP – ASP Technology – ASP Example – Modern Trends in ASP – Java and JVM – Java Servlets – Java Server Pages.

**UNIT- IV**

Active Web Pages: Active Web Pages in better solution – Java Applets – Why are Active Web Pages Powerful? – Lifecycle of Java Applets – ActiveX Controls – Java Beans. Middleware and Component-Based E-Commerce Architectures: CORBA – Java Remote Method Invocation – DCOM. EDI: Overview – Origins of EDI – Understanding of EDI – Data Exchange Standards – EDI Architecture – Significance of EDI – Financial EDI – EDI and internet.

**UNIT- V**

XML: SGML – Basics of XML – XML Parsers – Need for a standard. WAP: Limitations of Mobile devices – Emergence of WAP – WAP Architecture – WAP Stack – Concerns about WAP and its future – Alternatives to WAP.

**TEXT BOOKS:**

1. *Achyut S. Godbole and Atul Kahate*, 2003 . **Web Technologies Tcp/Ip To Internet Applications Architectures**[1st Edition] Tata Mc-Grawhill.(UNIT-I toUNIT-V)

**REFERENCE BOOKS:**

1. *Rajkamal*.2010.**Internet and Web Technologies** [13th Edition] Tata Mc-Grawhill.
2. *Behrouz A. Forouzan*. **Tcp/Ip Protocol Suite** [3rd Edition] Tata Mc-Grawhill.

| 15UCA5EB | ELECTIVE- I: SOFTWARE ENGINEERING | SEMESTER - V |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 6**

**OBJECTIVES:**

1. To learn about the systematic approach to the design, development, operating and maintenance of a software system
2. It provides knowledge in the development of software system of high quality
3. To be able to work with software development within different industrial sectors.

**CONTENTS**

**UNIT -I**

Introduction to Software Engineering: Definitions – Size Factors – Quality and Productivity Factors. Planning a Software Project: Planning the Development Process – Planning an Organizational Structure.

**UNIT- II**

Software Cost Estimation: Software cost Factors – Software Cost Estimation Techniques – Staffing-Level Estimation – Estimating Software Estimation Costs.

**UNIT-III**

Software Requirements Definition: The Software Requirements specification – Formal Specification Techniques. Software Design: Fundamental Design Concepts – Modules and Modularization Criteria.

**UNIT-IV**

Design Notations – Design Techniques. Implementation Issues : Structured Coding Techniques – Coding Style – Standards and Guidelines – Documentation Guidelines.

**UNIT-V**

Verification and Validation Techniques: Quality Assurance – Walkthroughs and Inspections – Unit Testing and Debugging – System Testing. Software Maintenance: Enhancing Maintainability during Development – Managerial Aspects of Software Maintenance – Configuration Management.

**TEXTBOOKS:**

1. *Richard Fairley. 1997.* **Software Engineering Concepts** Tata Mc-Grawhill. (UNIT-I to UNIT V)

**REFERENCE BOOKS:**

1. *Eve Andersonand Philip Greenspun and Andrew Grumet, 2006.* **Software Engineering For Internet Applications.** Prentice-Hall of India Publications.
2. *Jeff Tian.2006.***Software Quality Engineering** [Student edition] Wiley India.

| 15UCA5EC | ELECTIVE- I : EMBEDDED SYSTEM | SEMESTER - V |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 6**

**OBJECTIVES:**

1. To provide a clear understanding on the basic concepts, Building Blocks for Embedded System
2. To teach the fundamentals of System design with Partioning
3. To introduce on Embedded Process development Environment

## CONTENTS

### UNIT- I

Introduction to Embedded System: An Embedded System – Processor in the System – Other Hardware units – Software embedded into a system – Exemplary embedded system – Embedded system on chip and in VLSI circuit. Processor and Memory organization: Structural units in a processor – Processor selection – Memory devices – Memory selection - Allocation of memory – DMA – Interfacing processor, memories and I/O devices

### UNIT- II

Devices and buses for device networks: I/O devices – Timer and counting devices – Serial communication – Host system. Device drivers and Interrupts servicing mechanism: Device drivers – Parallel port device drivers – Serial port device drivers – Device drivers for IPTD – Interrupt servicing mechanism – Context and the periods for context-switching, dead-line and interrupt latency

### UNIT- III

Programming concepts and embedded programming in C and C++: Software programming in ALP and C – C program elements – Header and source files and processor directives – Macros and functions – Data types – Data structures – Modifiers – Statements – Loops and pointers – Queues – Stacks – Lists and ordered lists – Embedded programming in C++ - Java – C program compiler and cross compiler – Source code for

engineering tools for embedded C / C++ - Optimization of memory needs

**UNIT-IV**

Program modeling concepts in single and multi processor systems: Modeling process for software analysis before software implementation – Programming models for event controlled or response time constrained real time programs – Modeling of multiprocessor systems. Software engineering practices: Software algorithm complexity – Software development process life cycle and its models – Software analysis – Software design – Implementation – Testing, Validation and debugging – Software maintenance

**UNIT V**

Inter-process communication and synchronization of processes, tasks and threads: Multiple processor – Problem of sharing data by multiple tasks and routines – Inter process communication. Real time operating systems: Operating system services – I/O subsystem – Network operating systems – Real time and embedded operating systems – Interrupt routine in RTOS environment – RTOS task scheduling – Performance metric in scheduling

**TEXT BOOK:**

1. *Raj Kamal.* 2008. **Embedded Systems** [2nd Edition] Tata Mc-Grawhill

**REFERENCE BOOK:**

1. *Steven F. Barretl.2008.* **Embedded System**[1st Edition] Pearson

| 15UCA53P | CORE LAB -VI: PROGRAMMING IN DOT NET | SEMESTER - V |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 6**

**OBJECTIVES:**

1. To impact knowledge on Dot Net programming.
2. An understanding of how to use forms to develop GUI programs under .NET.
3. Knowledge of some of the tools available in the .NET Framework class library. (FCL)
4. Improved object-oriented programming skill through practice and insights gained by studying a new programming language

**CONTENTS**

1. Program to display current data and time using delegates and events.
2. Creating a C# .Net program to add a string to Combo box with value of Textbox when user clicks button control.
3. Creating a C# .Net program to display hierarchical representations of items with tree view control using Runtime coding.
4. Creating a C#.Net program to handle user defined Exceptions.
5. Creating a C# .Net program for Employee details to read and display the data using constructors and member functions.
6. Creating an application in C# .Net to demonstrate the following events:
    - *i.* Click
    - *ii.* Mouse Down
    - *iii.* Key Down
    - *iv.* Form Load

7. Creating an application in C# .Net for File Menu with Menu items New, Open, Save, Print and Exit and Edit Menu with Menu items Cut, Copy, Paste, Find and Undo.
8. Creating an application in C# .Net for student information database and perform the following operations:
    i. Insert
    ii. Delete
    iii. Update
9. Creating a login form to check the authentication of the user.
10. Designing a simple calculator.
11. Designing a notepad like application using menu editor.
12. Creating a web form to display the data in a data grid control (purchase database).
13. Validating the personal information using the validate controls.
14. Designing a simple web site that makes use of Master Pages.

| 15UCA5SA | SKILL BASED SUBJECT -2: CASE TOOLS CONCEPTS AND APPLICATIONS | SEMESTER - V |
|---|---|---|

**Total Credits: 3**
**Hours Per Week: 6**

**OBJECTIVES:**

1. To provide automated assistance for software development to the developers
2. The main goal of case technology is the automation of the entire information systems development life cycle process using a set of integrated software tools, such as modeling, methodology and automatic code generation.
3. To reduce the cost of software and the enhancement and quality of the software

**CONTENTS**

**UNIT- I**

Data Modeling: Business Growth-Organizational Model-Case Study of student MIS-What is the purpose of such Models-Understanding the business-Types of models-model development approach-the case for structural development-advantages of using a case tool. System analysis and design-what is DFD-General Rules for Drawing DFD-Difference Between Logical data flow diagram and Physical data flow diagram-Software verses Information Engineering-How case tools store information.

**UNIT -II**

Approach used to solve the problem statement: How to deal with a problem statement-Data flow diagram for Payroll System-Presentation Diagram for Payroll System-sehematics of the model-Forms-Screens-Menu Screens-Data entry Screens-Report Output Format-Utilities. Installation of Ubridge and Synthesis: How to use the tools in Ubridge Systhesis for case-Installation of Ubridge Synthesis-Computer Aided Software Engineering- Getting Ubridge to work-Setup-Assign-Housekeep-The Ubridge page.

**UNIT- III**

Introduction to Ubridge: Introduction - Main flow of the system prototyping your Report- Introducing the Novice Model of the Operation. Introducing Synthesis - Synthesis basic – Synthesis - Menu Drawing the screen-Requirement Definition-Diagram-Data Dictionary-Document-Synthesis Main Administration - Synthesis reference - importing and exporting screen.

**UNIT- IV**

Diagram definition tool: Introduction-Starting DDT-Drawing your own Icon - Defining the connection rules-Rebuilding your icon. Object oriented methodologies: Rumaugh Et.Al's object modeling techniques-The Booch methodology –The Jacobson Et.Al Methodologies-Pattern-Frame works-The Unified Approach.

**UNIT- V**

Introduction to UML-UML Diagram-Class Diagram-Use Case Diagram-Interaction Diagram- Sequence Diagram-Collobration Diagram-State Chart Diagram-Activity Diagram- Component Diagram-Deployment Diagram.

**TEXT BOOKS:**

1. *Ivan N Bayross.* **Case Tools Concepts and Applications** BPB Publications [UNIT I to UNIT III]
2. *Ali Batrami***. Object Oriented System Development using the unified modeling language** Mc GraHill International editions [UNIT IV to UNIT V]

**REFERENCE BOOK:**

1. *Ivan N Bayross.* 1995.**CASE Tools Concepts and Applications** BPB Publications

| 15UCA63A | CORE- X: PHP AND MYSQL | SEMESTER – VI |
|---|---|---|

**Total Credits: 4**
**Hours Per Week:5**

**OBJECTIVES:**

1. To understand the basics of Scripting Languages
2. To get knowledge on coding techniques to create Websites
3. To understand the design of Database and Database connectivity

**CONTENTS**

**UNIT -I**

Introduction to PHP - history of PHP - web application platform – static Html – client side technologies – server side – scripting – installation of PHP – syntax – variables – comments – string – output statements – objects - constants.

**UNIT -II**

PHP – Functions: calling a function – defining a function – variable scope – function parameter – return values – Boolean expressions – logical operators – branching – looping – strings – strings in PHP – case functions – Arrays: creating – retrieving – multi-dimensional arrays.

**UNIT-III**

MYSQL: Introduction – SQL language – role of MYSQL – features and benefits – basics of MYSQL and functions – MYSQL data types – DML queries – building forms from queries – operators – functions – working with data base and tables.

**UNIT- IV**

MYSQL and PHP: – installation of PHP– and MYSQL – connections – MYSQL with apache server – configuration – simple program using apache server -database connectivity.

**UNIT -V**

Ajax and PHP: Ajax introduction – database – XML – history of and Ajax – how does Ajax works, memory leaks, XML http requests – get or Post methods – problem and challenges – benefits of Ajax – how and when to Ajax – selecting the right tools – and frame work for Ajax.

**TEXT BOOK:**

1. *Steve Suehring*.2010. **PHP6 and MYSQL (Bible)**[1st Edition]

**REFERENCE BOOK:**

1. *Kevin Tatroe and Peter Macintyre and Rasmus Lerdorf* .2013.**Programming: PHP**[Third Edition] Oriell'y Publications.

| 15UCA63V | CORE- XI: PROJECT WORK | SEMESTER - VI |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 5**

## GUIDELINES FOR PROJECT WORK

- The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
- Each student should carry out individually one Project Work and it may be a work using the software packages that they have learned or the implementation of Concepts from the papers studied or implementation of any innovative idea.
- The Project work should be compulsorily done in the college only under the supervision of the Department staff concerned.
- University Exam will be conducted as follows.
- End Semester Viva
- Viva-voce will be conducted at the end of VI semester for 100 marks.
- Both the Internal ( Respective Guides) and External Examiners (50+50) should Conduct the Viva-Voce Examination at the last day of the practical session.
- Out of 50 marks, 25 for Project Evaluation and 25 for Viva.
- For awarding a pass, a candidate should have obtained 40% of the Total 100 marks.

| 15UCA6EA | ELECTIVE -II: CLOUD COMPUTING | SEMESTER - VI |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 5**

**OBJECTIVES:**

1. To Critique the consistency of services deployed from a cloud architecture
2. To manage work and personal schedules, edit digital photos and Learn how to use Web-based Applications to collaborate on cloud
3. To Evaluate the deployment of web services from cloud architecture

## CONTENTS

### UNIT -I

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Companies in the Cloud Today – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing –Who benefits from Cloud Computing .

### UNIT- II

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

### UNIT- III

Cloud Computing for the Family - Collaborating on Schedules – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

### UNIT – IV

Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on

Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Spread Sheet - Collaborating on Databases – Collaborating on Presentations - Storing and Sharing Files

**UNIT-V**

Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Evaluating Instant Messaging Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

**TEXT BOOK:**

1. *Michael Miller*, 2008., **Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online**, Que Publishing. (UNIT I to V)

**REFERENCE BOOKS:**

1. *Kumar Saurabh.* 2011. **Cloud Computing – Insights into New Era Infrastructure",** Wiley Indian Edition**.**
2. *Kaittwang Geoffrey C.Fox and Jack J Dongrra, Elsevier*.2012. **Distributed and Cloud Computing,**
3. *Raj Kumar Buyya***,** *Christian Vecchiola and S.Tanurai Selvi.* 2013. **Mastering Cloud Computing ,** Tata Mc-Grawhill.

| 15UCA6EB | ELECTIVE- II: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS | SEMESTER - VI |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 5**

**OBJECTIVES:**

1. To Acquire Knowledge on various AI Techniques and Expert Systems.
2. To inculcate knowledge on expert system concepts and functioning of AI
3. To understand the Problem solving, Search, Heuristic methods

## CONTENTS

**UNIT -I**

Introduction: AI Problems – AI techniques – Criteria for success. Problems, Problem Spaces, Search: State space search – Production Systems – Problem Characteristics – Issues in design of Search.

**UNIT - II**

Heuristic Search techniques: Generate and Test – Hill Climbing – Best-First, Problem Reduction, Constraint Satisfaction, Means-end analysis.

**UNIT -III**

Knowledge representation issues: Representations and mappings – Approaches to Knowledge representations – Issues in Knowledge representations – Frame Problem.

**UNIT -IV**

Using Predicate Logic: Representing simple facts in logic – Representing Instance and Isa relationships – Computable functions and predicates – Resolution – Natural deduction.

**UNIT- V**

Representing knowledge using rules: Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge Brief explanation of Expert Systems- Definition- Characteristics-architecture- Knowledge Engineering- Expert System Life Cycle-Knowledge Acquisition Strategies- Expert System Tools.

**TEXT BOOK:**

1. *Elaine rich and Kelvin Knight*, 1991.**Artificial Intelligence,**[2nd Edition],Tata McGrawhill Publication.(UNIT I to V )**.**

**REFERENCE BOOKS:**

1. *Stuart Russell and Peter Norvig.2009.* **Artificial Intelligence a modern Approach** [2nd Edition] Prentice-Hall of India Publications.
2. *George F Luger* , 2002**. Artificial Intelligence** [4th Edition ] Tata Mc-Grawhill

| 15UCA6EC | ELECTIVE -II: COMPUTER GRAPHICS | SEMESTER - VI |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 5**

**OBJECTIVES:**

1. To provide a comprehensive introduction to computer graphics leading to the ability to understand contemporary terminology, progress, issues, and trends.
2. To form Mathematical Knowledge on Graphics and Technical background of 2D and 3D objects
3. To learn computer graphics techniques, focusing on 2D and 3D modeling, image synthesis, and rendering.

## CONTENTS

**UNIT- I**

Output Primitives: Points and Lines – Line-Drawing algorithms – Loading frame Buffer – Line function – Circle-Generating algorithms – Ellipse-generating algorithms. Attributes of Output Primitives: Line Attributes – Curve attributes – Color and Grayscale Levels – Area-fill attributes – Character Attributes.

**UNIT -II**

2D Geometric Transformations: Basic Transformations – Matrix Representations – Composite Transformations – Other Transformations. 2D Viewing: The Viewing Pipeline – Viewing Co-ordinate Reference Frame – Window-to-Viewport Co-ordinate Transformation - 2D Viewing Functions – Clipping Operations – Point, Line, Polygon, Curve, Text and Exterior clippings.

**UNIT- III**

3D Concepts: 3D Display Methods – 3D Graphics Packages. 3D Object Representations: Polygon Surfaces – Curved lines and Surfaces – Quadric Surfaces – Super quadrics – Blobby Objects – Spline representations. 3D Geometric Modeling and Transformations: Translation – Rotation –

Scaling – Other Transformations – Composite Transformations – 3D Transformation functions.

**UNIT- IV**

Visible-Surface Detection Methods: Classification of Visible-Surface algorithms – Back-Face Detection – Depth-Buffer Method – A-Buffer method- Scan-Line Method – Depth- Sorting Method – BSP-Tree Method – Area-Subdivision Method – Octree Methods – Raycasting Methods – Curved surfaces – Wire frame Methods – Visibility-Detection functions.

**UNIT- V**

Illumination Models: Properties of Light – Standard Primaries ad the Chromaticity Diagram – Intuitive color Concepts – RGB Color Model – YIQ Color Model – CMY Color Model – HSV Color Model – Conversion between HSV and RGB models – Color selection and Applications.

***TEXTBOOKS:***

1. *Donald Hearn and M. Pauline Baker .2001.* **Computer Graphics [**2nd Edition], Prentice-Hall of India Publications. ***(UNIT I to V)***

***REFERENCE BOOKS:***

1. *Willium M. Newman andRobert F. Sproull. 2007.* **Principles Of Interactive Computer Graphics** Tata Mc-Grawhill.
2. *Krishnamoorthy,N.2003.***Introduction to Computer Graphics** [6th Edition] Tata Mc-Grawhill

| 15UCA6ED | ELECTIVE- III: DATA MINING | SEMESTER - VI |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 5**

**OBJECTIVES:**

1. To understand basic concepts, tasks, methods, and techniques in data mining.
2. To provide a comprehensive introduction to techniques in data mining and knowledge discovery.
3. To understanding of the data mining process and issues, learn various techniques for data mining, and apply the techniques in solving data mining problems using data mining tools and systems.

**CONTENTS**

**UNIT- I**

Basic Data Mining Tasks – Data Mining Versus Knowledge Discovery in Data Bases – Data Mining Issues – Data Mining Matrices – Social Implications of Data Mining – Data Mining from Data Base Perspective.

**UNIT -II**

Data Mining Techniques – a Statistical Perspective on data mining – Similarity Measures – Decision Trees – Neural Networks – Genetic Algorithms.

**UNIT -III**

Classification : Introduction – Statistical – Based Algorithms – Distance Based Algorithms – Decision Tree – Based Algorithms – Neural Network Based Algorithms – Rule Based Algorithms – Combining Techniques.

**UNIT- IV**

Clustering: Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms . Partitional Algorithms.

**UNIT- V**

Association Rules: Introduction - Large Item Sets – Basic Algorithms – Parallel and Distributed Algorithms – Comparing Approaches – Incremental Rules – Advanced Association Rules Techniques – Measuring the Quality of Rules.

**TEXT BOOK**

1. *Margaret H.Dunbam. 2003.* **Data Mining Introductory and Advanced Topics** Pearson Education.

**REFERENCE BOOK**

1. *Jiawei Han and Micheline Kamber* 2001. **Data Mining Concepts and Techniques** Academic Press.

| 15UCA6EE | ELECTIVE- III: MOBILE COMPUTING | SEMESTER - VI |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 5**

**OBJECTIVES:**

1. To inculcate knowledge on Mobile Computing.
2. To understanding of mobile technologies and how these technologies are utilized and integrated to meet specific business needs.
3. To understanding of current technologies and architectures that provide the network and communications infrastructure for mobile-enabled enterprise computer systems.

## CONTENTS

**UNIT- I**

Introduction: Mobility of Bits and Bytes –Wireless The Beginning – Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Application and services- Developing Mobile computer Applications – security in mobile computing – Standards _ Why is it necessary – Standard bodies. MOBILE COMPUTING ARCHITECTURE: History of computers and Internet – Architecture for mobile computing – Three-tier architecture – Design considerations for mobile computing – Mobile computing through Internet – Making exiting applications mobile enabled.

**UNIT- II**

MOBILE COMPUTING THROUGH TELEPHONY: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – IVR Application – Voice XML – TAPI.

**UNIT- III**

EMERGING TECHNOLOGIES: Blue Tooth – RFID – WiMAX – Mobile IP – IPv6 – Java Card. GSM : Global System for mobile communications – GSM Architecture – GSM Entities – Call routing in GSM – PLMN

Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – GSM Frequency allocations – Authentications and Security-SMS.

**UNIT -IV**

GPRS – GPRS and packet data network – GPRS network architecture – GPRS network operations – Data services in GPRS – Application for GPRS- Limitations – Billing and Charging. WAP : MMS – GPRS Applications.

**UNIT -V**

CDMA and 3G: Spread spectrum technology – Is 95 – CDMA vs GSM – Wireless Data – Third generation networks – Applications on 3G WIRELESS LAN: Wireless LAN advantages – IEEE 802.11 standards – Architecture – Mobile in Wireless LAN – Deploying wireless LAN – Mobile adhoc networks and sensor networks – Wireless LAN Security – WiFi vs 3G.

**TEXT BOOK**

1. *Asoke K Talukder and Roopa R Yavagal*.2005. **Mobile Computing**, Tata Mc-Grawhill (UNIT I –UNIT V).

**REFERENCE BOOK**

1. *Raj Kamal.* 2007. **Mobile Computing** [2nd Edition] Oxford Higher Education.

| 15UCA6EF | ELECTIVE- III: DIGITAL IMAGE PROCESSING | SEMESTER - VI |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 5**

**OBJECTIVES:**

1. To study the image fundamentals and mathematical transforms Necessary for image processing.
2. To study the image enhancement techniques and
3. To study image restoration procedures image compression procedures.

## CONTENTS

### UNIT- I

**Digital Image Fundamentals**

Introduction – Origins of Digital Image Processing - Fundamental Steps in DIP – Components of an Image Processing System – Elements of Visual Perception - Image Sensing and acquisition – Image Sampling and Quantization- Linear and nonlinear Operations.

### UNIT- II

**Image enhancement in the Spatial Domain**

Some basic gray level transformations – histogram processing – Enhancement using arithmetic / logic operations – basics of spatial filtering – Smoothing spatial filtering – sharpening spatial filtering – Combining spatial enhancement methods.

### UNIT -III

**Image restoration**

A model of the image degradation / restoration process – noise models – restoration in the presence of noise only-spatial filtering – periodic noise reduction by frequency domain filtering – linear, position–invariant degradations – estimating the degradation functions – inverse filtering – minimum mean square error(winner) filtering – constrained least square filtering – geometric mean filter – geometric transformations.

**UNIT- IV**

**Image compression**

Fundamentals – image compression models, elements of information theory – error-free compression – lossy compression – image compression standards.

**UNIT- V**

**Image segmentation**

Detection of discontinuities – edge linking and boundary detection – thresholding – region based segmentation – segmentation by morphological watersheds – the use of motion in segmentation.

**TEXT BOOK:**

1. *Gonzalez, R.C and Woods R.E.* 2002. **Digital Image Processing** [2nd Edition] Pearson Education(Unit I –Unit V).

**REFERENCE BOOKS**:

1. *Sid Ahmed*, 1995. **Image Processing**, Tata McGraw Hill, New York.
2. *Milan Sonka and Vaclav Hlavac and Roger Boyle,* 1999. **Image processing Analysis and Machine Vision** [Second Edition] Thomson Brooks/Cole.

| 15UCA63P | CORE LAB- VII: PROGRAMMING IN PHP AND MYSQL | SEMESTER - VI |
|---|---|---|

**Total Credits: 4**
**Hours Per Week: 5**

**OBJECTIVES:**

1. To learn the practical skills on PHP and MYSQL
2. Gain the PHP programming skills needed to successfully build interactive, data-driven sites
3. PHP Programming and MYSQL for Web Development course the delegate will have a good practical knowledge of how to write successful HTML/PHP code utilizing a MYSQL database

**CONTENTS**

1. Program to send an HTML formatted Email in PHP.
2. Program to do different types of Sorting in PHP.
3. Program to do String Manipulation in PHP.
4. PHP program to get color code from the user which displays the color name.
5. PHP program to do calculator functions
6. Program to upload a file in PHP.
7. Program for login authentication using PHP and MYSQL
8. Creating Pay slip for an employee using PHP and MYSQL
9. Creating Electricity bill using PHP and MYSQL, and generate the reports
10. Creating student data base with DML QURIES.
11. Program to demonstrate how a web page can communicate with a web
12. server while a user type characters in an input field
13. Downloading a small project module and convert into our Requirement
14. Example website
    1. www.phpclasses.com
    2. www.codeguru.com

| 15UCA6SP | SKILL BASED LAB- 2: CASE TOOLS | SEMESTER - VI |
|---|---|---|

**Total Credits: 3**
**Hours Per Week: 5**

**OBJECTIVES**

1. Model helps us to visualize a system as it is.
2. Model permit us to specify the structure or behavior of a system.
3. Model gives us a template guides us in constructing a system.

## CONTENTS

1. Designing of an ATM transfer system using UML diagram and to generate VB code.
2. Designing student mark analysis using UML diagram and to generate VB code.
3. Designing platform assignment system using UML diagram and to generate VB code.
4. Designing railway reservation system using UML diagram and to generate VB code.
5. Designing an expert system for medicine field using UML diagram and to generate VB code.
6. Designing stock maintenance system using UML diagram and to generate VB code.
7. Designing quizzing system using UML diagram and to generate VB code.
8. Designing remote computer monitoring system using UML diagram and to generate VB code.
9. Designing online ticket reservation system using UML diagram and to generate VB code.
10. Designing E-mail client server system using UML diagram and to generate VB code.
11. Designing Library information system using UML diagram and to generate VB code.
12. Designing of any Banking service system using UML diagram and to generate VB code.

**Revised syllabus for 2015-2018 Batch with effect from Third Semester onwards**

# BACHELOR OF COMPUTER APPLICATIONS REGULATIONS

## ELIGIBILITY

A candidate who has passed in Higher Secondary Examination with any Academic stream or Vocational stream as one of the subject under Higher Secondary Board of Examination, Tamil Nadu as per the norms set by the Government of Tamil Nadu or an Examination accepted as equivalent thereto by the Academic Council, subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the **Bachelor of Computer Applications Degree Examination** of this College after a course of study of three academic years.

## OBJECTIVE OF THE COURSE

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. The BCA is catering to the needs of the students aspiring to excel in the fields of computers.
2. Carrying out the required analysis and synthesis involved in computer systems, information systems and computer applications.
3. Demonstrating professional competence in developing software and in its design and implementation.
4. To Train and equip the students to meet the requirement of the corporate.
5. To stimulate an interest in computing as an academic discipline with a view to encouraging progression to research.

## SCHEME OF EXAMINATION

| Course | Subject | Hrs of Instruction | Exam Duration (Hrs) | Max Marks | | | Credit Points |
|---|---|---|---|---|---|---|---|
| | | | | CA | CE | Total | |
| **First Semester** | | | | | | | |
| **Part - I** | | | | | | | |
| 15UTL11T/ 15UHL11H/ 15UML11M/ 15UFL11F | Tamil-I/ Hindi-I/ Malayalam-I/ French – I | 6 | 3 | 25 | 75 | 100 | 4 |
| **Part - II** | | | | | | | |
| 15UEG12E | English - I | 6 | 3 | 25 | 75 | 100 | 4 |
| **Part - III** | | | | | | | |
| 15UCA13A | Core I: C Programming | 4 | 3 | 25 | 75 | 100 | 4 |
| 15UCA13B | Core II: Digital Fundamentals and Architecture | 4 | 3 | 25 | 75 | 100 | 4 |
| 15UMA1AB | Allied I: Mathematical Structures for Computer Science | 5 | 3 | 25 | 75 | 100 | 4 |
| 15UCA13P | Core Practical -I: Programming Lab C | 3 | 3 | 40 | 60 | 100 | 4 |
| **Part - IV** | | | | | | | |
| 15UFC1FA | Foundation Course - I : Environmental Studies | 2 | 3 | __ | 50 | 50 | 2 |
| | | **30** | | | | **650** | **26** |
| **Second Semester** | | | | | | | |
| **Part - I** | | | | | | | |
| 15UTL21T/ 15UHL21H/ 15UML21M/ 15UFL21F | Tamil-II/ Hindi-II/ Malayalam-II/ French – II | 6 | 3 | 25 | 75 | 100 | 4 |
| **Part - II** | | | | | | | |
| 15UEG22E | English - II | 6 | 3 | 25 | 75 | 100 | 4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Part - III** | | | | | | | |
| 15UCA23A | Core III: C++ Programming | 5 | 3 | 25 | 75 | 100 | 4 |
| 15UMA2AB | Allied II: Discrete Mathematics | 5 | 3 | 25 | 75 | 100 | 4 |
| 15UCA23P | Core Practical - II : Programming Lab C++ | 4 | 3 | 40 | 60 | 100 | 4 |
| 15UCA23Q | Core Practical - III : Internet and Office Automation | 2 | 3 | 20 | 30 | 50 | 2 |
| **Part - IV** | | | | | | | |
| 15UFC2FA | Foundation Course- II : Value Education / Human Rights | 2 | 3 | — | 50 | 50 | 2 |
| | | **30** | | | | **600** | **24** |
| **Third Semester** | | | | | | | |
| **Part - III** | | | | | | | |
| 15UCA33A | Core IV: Data Structures and Algorithms | 6 | 3 | 25 | 75 | 100 | 4 |
| 15UCA33B | Core V: Java Programming | 6 | 3 | 25 | 75 | 100 | 4 |
| 15UMA3AB | Allied III : Computer Based Optimization Techniques | 6 | 3 | 25 | 75 | 100 | 4 |
| 15UCA33P | Core Practical – IV: Java Programming | 5 | 3 | 40 | 60 | 100 | 4 |
| **Part - IV** | | | | | | | |
| 15UCA3SA | Skill Based Subject 1 : Multimedia and Web Designing | 3 | 3 | 20 | 55 | 75 | 3 |
| 15UFC3FA/ 15UFC3FB/ 15UFC3FC/ 15UFC3FD/ 15UFC3FE | Tamil @ / Advanced Tamil# (Or) (Yoga for Human Excellence) /Women's Rights / Constitution in India | 2 | 3 | - | 50 | 50 | 2 |
| | NMEC - I | 2 | 3 | - | 50 | 50 | 2 |
| | | **30** | | | | **575** | **23** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Fourth Semester** | | | | | | | |
| **Part - III** | | | | | | | |
| 15UCA43A | Core VI: Operating Systems | 5 | 3 | 25 | 75 | 100 | 4 |
| 15UCA43B | Core VII: Visual Basic and RDBMS | 6 | 3 | 25 | 75 | 100 | 4 |
| 15UCA43P | Core Practical – V: VB & ORACLE | 6 | 3 | 40 | 60 | 100 | 4 |
| 15UPA4AC | Allied IV: Business Accounting | 5 | 3 | 25 | 75 | 100 | 4 |
| **Part - IV** | | | | | | | |
| 15UCA4SP | Skill Based Practical-I: Multimedia and Web Designing | 4 | 3 | 30 | 45 | 75 | 3 |
| 15UFC4FA/ 15UFC4FB/ 15UFC4FC/ | Tamil /Advanced Tamil (OR) General Awareness | 2 | 3 | - | 50 | 50 | 2 |
| | NMEC - II | 2 | 3 | - | 50 | 50 | 2 |
| | | **30** | | | | **575** | **23** |
| **Fifth Semester** | | | | | | | |
| **Part - III** | | | | | | | |
| 15UCA53A | Core - VIII: Data Communication and Networks | 6 | 3 | 25 | 75 | 100 | 4 |
| 15UCA53B | Core - IX: Programming in Dot Net | 6 | 3 | 25 | 75 | 100 | 4 |
| | Elective I : | 6 | 3 | 25 | 75 | 100 | 4 |
| 15UCA53P | Core Practical – VI: Dot net Programming | 6 | 3 | 40 | 60 | 100 | 4 |
| **Part - IV** | | | | | | | |
| 15UCA5SA | Skill Based Subject II: Case Tools Concepts and Applications | 6 | 3 | 20 | 55 | 75 | 3 |
| | | **30** | | | | **475** | **19** |

| **Sixth Semester** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Part - III** | | | | | | | |
| 15UCA63A | Core - X: PHP & MySQL | 5 | 3 | 25 | 75 | 100 | 4 |
| 15UCA63P | Core Practical – VII: PHP & MySQL Programming | 5 | 3 | 40 | 60 | 100 | 4 |
| 15UCA63V | Core - XI: Project Work | 5 | 3 | 40 | 60 | 100 | 4 |
| | Elective II : | 5 | 3 | 25 | 75 | 100 | 4 |
| | Elective III: | 5 | 3 | 25 | 75 | 100 | 4 |
| **Part - IV** | | | | | | | |
| 15UCA6SP | Skill Based Practical - II : Case Tools | 5 | 3 | 30 | 45 | 75 | 3 |
| **Part - V** | | | | | | | |
| 15UEX65A | EXTENSION ACTIVITY | - | - | 50 | - | 50 | 2 |
| | | **30** | | | | **625** | **25** |
| | | | | | **Grand Total** | **3500** | **140** |

## ELECTIVE – I

(Student shall select any one of the following subject as Elective-I in fifth semester)

| S.No | Subject Code | Name of the Subject |
|---|---|---|
| 1. | 15UCA5EA | A. Web Technology |
| 2. | 15UCA5EB | B. Software Engineering |
| 3. | 15UCA5EC | C. Embedded System |

## ELECTIVE - II

(Student shall select any one of the following subject as Elective-II in sixth semester)

| S.No | Subject Code | Name of the Subject |
|---|---|---|
| 1. | 15UCA6EA | A. Cloud Computing |
| 2. | 15UCA6EB | B. Artificial Intelligence and Expert System |
| 3. | 15UCA6EC | C. Computer Graphics |

## ELECTIVE - III

(Student shall select any one of the following subject as Elective-III in sixth semester)

| S.No | Subject Code | Name of the Subject |
|---|---|---|
| 1. | 15UCA6ED | D. Data Mining |
| 2. | 15UCA6EE | E. Mobile Computing |
| 3. | 15UCA6EF | F. Digital Image Processing |

## NON MAJOR ELECTIVE COURSE

- The department offers the following two papers as Non Major Elective Course for other than the computer science students.

| S.No | Subject Code | Name of the Subject |
|---|---|---|
| 1 | 15UED34M | Security in Computing |
| 2 | 15UED44M | Big Data Analytics |

## FOR COURSE COMPLETION

Students shall complete:

- Language papers (Tamil/Malayalam/French/Hindi, English) in I and II semester.
- Environmental Studies, Human Rights, Women's Rights / Yoga and General Awareness in I, II, III & IV semester respectively.
- Allied papers in I, II, III and IV semesters.
- Non Major Elective Course in Third and Fourth semester.
- Extension activity in VI semester.
- Elective papers in the fifth and sixth semesters.
- An in-house project at the end of VI semester.

## Total Credit Distribution

| Subjects | Credits | Total | | Credits | Cumulative Total |
|---|---|---|---|---|---|
| **Part I:** Tamil | 4 | 2x 100 = | 200 | 08 | 16 |
| **Part II:** English | 4 | 2x 100 = | 200 | 08 | |
| **Part III:** | | | | | |
| Core | 4 | 13 x 100 | 1300 | 52 | 98 |
| Core Practical | 4 | 6 x 100 = | 600 | 24 | |
| Core Practical | 2 | 1 x 50 = | 50 | 02 | |
| Project | 4 | 1 x 100= | 100 | 04 | |
| Allied Theory | 4 | 4 x 100 = | 400 | 16 | |
| **Part IV:** | | | | | |
| Foundation Course:<br>1.Environmental Studies | 2 | 1 x 50 = | 50 | 02 | 24 |
| 2.Human Rights | 2 | 1 x 50 = | 50 | 02 | |
| 3. Tamil @ / Advanced Tamil# (OR) Yoga for Human Excellence# / Women's Rights# /#Constitution in india# | 2 | 1 x 50 = | 50 | 02 | |
| 4. Tamil @ /Advanced Tamil # (OR) General | 2 | 1 x 50 = | 50 | 02 | |
| Skill Based | 3 | 4 x 75 = | 300 | 12 | |
| EDC | 2 | 2 x 50 = | 100 | 04 | |
| **Part V:** | | | | | |
| Extension Activity | 2 | 1 x 50 = | 50 | 02 | 02 |
| **Total** | | | **3500** | **140** | **140** |

| 15UCA33A | CORE-IV: DATA STRUCTURES AND ALGORITHMS | SEMESTER - III |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 6**

**OBJECTIVES:**

1. To understand and analyze algorithms
2. To learn fundamentals of linear and non-linear Data structures
3. To be familiar with searching and sorting

## CONTENTS

**UNIT- I**

**Introduction:** Introduction of Algorithms, Performance Analysis. **Arrays and structures**: Representation of Arrays, create, insert and delete of data elements - sparse Matrices **Stacks and Queues**: Stacks - Queues - Circular Queues - Evaluation of Expression -Infix to Postfix Conversion.

**UNIT- II**

**Linked List:** Singly Linked List : Insertion – Deletion - Linked Stacks and Queues - Polynomial Addition – Circular Linked Lists - Doubly Linked List .

**UNIT-III**

**Trees:** Basic Terminology and Representation - Binary Trees - Binary Tree Representations - Binary Trees Traversals - Threaded Binary Trees - Binary Search Trees – Search , Insert , Delete - **Efficient Binary Search trees**: AVL trees

**UNIT-IV**

**Graphs:** Terminology and Representations – Traversals : Depth First Search, Depth Search – Minimum cost Spanning Trees- Shortest Paths and Transitive Closure

**UNIT-V**

**Searching:** Linear and Binary Search - **Sorting:** Bubble sort - Insertion Sort - Quick Sort - Merge Sort - Heap Sort **Hashing Techniques** : Static Hashing : Hash Tables - Hashing Functions - Overflow Handling - Dynamic Hashing : Directories.

**TEXT BOOK:**

1. *Horowitz, Shani, Anderson - Freed* **Fundamentals of Data Structures in C***[*2nd Edition*]* Universities Press. (Unit I – Unit – V).

**REFERENCE BOOKS:**

1. *Ellis Horowitz, Sartaj Shani*, "**Data and File Structures**", Galgotia Publication (Unit IV – Unit – V).
2. *Malik,D,S.,* 2003. **Data structures using C++** [1st Edition] Cengage learning
3. *Vaugha H.Patil, 2012*. **Data Structures Using C++**[1st Edition] Oxford Higher Education

| 15UCA33B | CORE - V: JAVA PROGRAMMING | SEMESTER - III |
|---|---|---|

**Total Credits: 4**

**Hours Per Week: 6**

**OBJECTIVES:**

1. To understand the principles of object oriented programming concepts using java.
2. Subject deals with basic programming Techniques in Core Java
3. Subject enables to create wide range of Applications and Applets using Java

## CONTENTS

### UNIT-I

Java Evolution: History – Features – How java differ from c and c++? - Overview of Java: simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine. Constants, Variables, Data Types - Operators and Expressions – Decision Making and Branching: if, if..else, nested if, switch, ? : Operator - Decision Making and Looping: while, do, for – Jumps in Loops - Labeled Loops.

### UNIT-II

Classes, Objects and Methods Arrays, Strings and Vectors – Interfaces: Multiple Inheritance – Packages: Putting classes together – Multithreaded Programming.

### UNIT-III

Managing Errors and Exceptions – Applet Programming : Applet a life cycle – Graphics programming : Line and rectangle – circle and ellipse – Drawing arc and polygons.

### UNIT-IV

Managing Input / Output Files in Java : Concepts of Streams- Stream Classes – Byte Stream classes – Character stream classes – Using streams – I/O Classes – File Class – I/O exceptions – Creation of files – Reading / Writing characters, Byte-Handling Primitive data Types – Random Access Files.

**UNIT-V**

AWT classes, Working with Frame windows, Working with Graphics Buttons - RMI: Simple client/server applications using RMI-

T**EXT BOOKS:**

1. *Balagurusamy ,E.* **Programming with Java – A Primer** [Third Edition] TMH
2. *Hebert Schildt.* **Java the Complete Reference** [Eighth Edition] TMH

**REFERENCE BOOKS:**

1. *Black book.* ***Java6 programming - Kogent solutions Inc****[2007 Edition]* Dreamtech press
2. *John R. Hubbard*.2009. **Programming with Java [** Second Edition] TMH.

| 15UMA3AB | ALLIED - III : COMPUTER BASED OPTIMIZATION TECHNIQUES | SEMESTER - III |
|---|---|---|

**Total Credits : 4**

**Hours Per Week: 6**

**OBJECTIVE:**

1. On successful completion of this subject the students should have:- Understanding various mathematical applications in industries. Decision making for real time environment.

## CONTENTS

**UNIT-I**

Linear Programming -Mathematical Model assumption of linear Programming –Graphical method -Principles of Simplex method, Big-M Method ,Duality, Dual simplex method.

**UNIT-II**

Transportation and assignment problem -Integer Programming Branch and Round Techniques -Assignment and Traveling Salesman Problem.

**UNIT-III**

Game Theory -Concept of Pure and Mixed Strategies –Solving 2 x 2 matrix with and without saddle point -n x 2 -2 x m games. Replacement models -Elementary replacement models -present value -rate of return -depreciation -Individual replacement –Group replacement.

**UNIT-IV (Derivations not included)**

Queuing Theory -definition of waiting line model Queue discipline -traffic intensity - poison arrival –Birth death process -Problem from single server: finite and infinite population model –Problems from multi server: finite and infinite population model.

**UNIT-V**

PERT & CPM -Network representation -backward pass -Forward pass -computation -Pert Network -Probability factor –updating and Crashing.

**TEXT BOOK:**

1. *Manmohan , Gupta, P.K. & Kanthiswarup, 1997.* **OPERATIONS RESEARCH** S. CHAND & SONS. (UNIT I to V)

**REFERENCE BOOKS:**

1. *Hamdy A Taha, 2002.* **OPERATIONS RESEARCH** [7th edition], Pearson Education.
2. *Gupta, P.K. & Hira, D.S.* **PROBLEMS IN OPERATIONS RESEARCH,** Chand Pub.

| 15UCA33P | CORE PRACTICAL - IV: JAVA PROGRAMMING | SEMESTER - III |
|---|---|---|

**Total Credits: 4**

**Hours Per Week : 5**

**OBJECTIVES:**

1. To include knowledge on implementation of algorithm and key concepts using Java.
2. Design, write, and test a Java program to implement a solution to a given problem specification.
3. Understand the operation of common data structures and algorithms.

## CONTENTS

1. Looping
2. Array
3. String Manipulation
4. Inheritance.
5. Interface.
6. Package.
7. Multithreading.
8. Exception Handling.
9. Applet and Graphics Programming.
10. AWT components
11. File Handling.
12. RMI

| 15UCA3SA | SKILL BASED SUBJECT - I : MULTIMEDIA AND WEB DESIGNING | SEMESTER - III |
|---|---|---|

**Total Credits : 3**

**Hours Per Week : 3**

**OBJECTIVES:**

1. To inculcate knowledge on Media, Text, Image, Audio, Video, Animation etc.
2. To design Graphical images using Image-Editing tools
3. To learn Capturing, Creating and Editing Audio and Video through external devices.

## CONTENTS

### UNIT-I

**Introduction:** Defining Web Designing –Scope of Multimedia in Web Designing- Principle and best practices for Web Designing – Designing a Website – Exploring Multimedia and Web Design Tools and Technologies.

### UNIT-II

**Introduction to Photoshop:** Exploring the User Interface – Exploring Screen modes – Creating new document – Saving Files – **Working with Graphics:** Exploring different Image format for Web – Placing Images – Editing Images – Applying effects – Working with colour modes – creating a Website Design – Designing a website template .

### UNIT-III

**Introduction to Flash:** Creating a new Flash file – Exploring the Flash Interface – Working with workspace – Working with objects – Converting an object into symbol – Using motion tween – Creating an Animation Slide.

### UNIT-IV

**Introduction to Dreamweaver :** Creating a new document – Defining a website structure – Exploring the Dreamweaver Interface – Creating a Website – Working with text – Working with Graphics – Working with Hyperlinks – Working with Templates.

**UNIT-V**

**Introduction to HTML :** Exploring HTML tags – Creating a HTML document – Exploring Block Oriented Elements – Working with Font Tags- Working with Lists – Working with Hyperlink- Working with Images - Working with Tables - Working with Frames.

**TEXT BOOK:**

1. *Vikas Gupta, 2010.* **Comdex Multimedia And Web Design Course Kit** DreamTech press (UNIT I to V )

**REFERENCE BOOKS:**

1. *Tay Vaughan.2008.* **Multimedia: Making it Work** [7th edition], TMH.
2. *Ranjan Parekh , 2007.* **Principles of Multimedia** TMH.

| 15UCA43A | CORE - VI: OPERATING SYSTEM | SEMESTER - IV |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 5**

**OBJECTIVES:**

1. To understand the basic concepts of Operating Systems.
2. To discuss the components and responsibilities of operating system.
3. To introduce the operating system as a resource manager for resources like memory, process, device, data and file

## CONTENTS

**UNIT-I**

**Introduction:** What is an OS?-Batch-timesharing-Parallel – real time – distributed process: The Process – Process State – Process Control block-Inter Process Communication.

**UNIT-II**

**CPU Scheduling:** CPU/I/O burst cycle-CPU Scheduler-Preemptive Scheduling- Scheduling Criteria-Scheduling Algorithms: First come First served-Shortest job first – Priority –Round Robin.

**UNIT III**

**Process Synchronizatio**n: Critical Section - Semaphores-Reading/Writing Problem – Dining Philosopher problem – monitor, Deadlock: Characterization –Prevention –Avoidance – Detection - Recovery.

**UNIT-IV**

**Storage Management System:** Logical versus physical Address space-Swapping-Contiguous memory Allocation-Paging-Segmentation-**Virtual Memory:** Demand Paging-Page Replacement Strategies.

**UNIT-V**

**I/O Hardware -Disk Scheduling**: FCFS-SSTF-SCAN-CSCAN-Look. **File System**: File Concept-Access Methods-Directory structures.

**TEXT BOOK:**

1. *Silber schatz,peter galvin,greg gagne,* **Applied Operating System Concepts** [1st Edition],John Wiley & sons Pvt. Ltd.

**REFERNECE BOOKS:**

1. *Achyut S. Godbole, 1997.* **Operating Systems**[1st edition], TMH.
2. *Andrew S. Tanenbaum, 1997.* **Modern Operating Systems** [1st Edition], PHI.

| 15UCA43B | CORE-VII:<br>VISUAL BASIC AND RDBMS | SEMESTER - IV |
|---|---|---|

**Total Credits: 4**

**Hours Per Week : 6**

**OBJECTIVES:**

1. To inculcate Knowledge in Visual Programming to design User Interface applications
2. To understand Relational Database Concepts to implement in real time applications
3. To understand importance of visual programming and database concepts

## CONTENTS

### UNIT-I

Introducing Visual Basic: What is VB? – Event and Event Procedures – Object related concepts –VB Program Components – VB environment. Visual Basic Fundamentals: Variables – Data Types and Declarations – Operators and Expressions – String Expressions – Library Functions - Branching and Looping: Branching, selection and looping statements.

### UNIT-II

Visual Basic control Fundamentals: Control tools – Menus and Dialog Boxes: Building Drop-Down Menus – Submenus – Pop-Up Menus – Dialog Boxes – MsgBox Function – The Input Box function.

### UNIT-III

Procedures: Modules and Procedures – Sub Procedures – Event Procedures – Function Procedures – Scope. Arrays: Declarations – Processing array elements – Passing Arrays to Procedures – Array-related Functions – Control Arrays – Looping with for Each-Next.

### UNIT-IV

**Database Concepts: A Relational approach:** Database – Relationships – DBMS – Relational Database Model -Integrity Rules – Theoretical Relational languages - Data Modeling – Dependency – Normal forms – **Data Definition Language(DDL) :** Datatypes- constraints – Create table – Alter table – Drop table

**UNIT –V**

**Data Manipulation Language (DML):** Insert – Update – Delete – Retrieving data - Restricting data with where clause- sorting - **Working with Tables :** Functions and Grouping- Multiple Tables-Joins and Set operations – Nested Queries – Views.

**TEXT BOOKS:**

1. Byron S. Gottfried , 2002. Visual Basic – Schaum'S Outline Series[1st Edition] TMH. (UNIT I to III)
2. Nilesh Shah, 2008. Database Systems Using Oracle [2nd Edition]PHI (UNIT IV to V)

**REFERENCE BOOKS:**

1. Eric A Smith& Valor Whisher& Hank Marquis. 1998. Visual Basic 6 Programming Bible[Illustrated Edition] Wiley.
2. Cornell.1999 Visual Basic 6 From the Ground Up, Tata Mcgraw – Hill Company Ltd, Edition.
3. Oracle Press. 2002. Oracle 9i: A Beginener's Guide [Eleventh Reprint] Tata McGraw Hill

| 15UPA4AC | ALLIED- IV:<br>BUSINESS ACCOUNTING | SEMESTER - IV |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 5**

**OBJECTIVES:**

The subject aims to build the concepts regarding:

1. To understood the Concepts and conventions of Accounting and Basic Accounting framework.
2. Prepare financial statement analysis to evaluate the financial performance of a company.

**CONTENTS**

**UNIT – I**

Fundamentals of Book Keeping: Definition, objectives, methods of accounting, Branches of accounting, Types of Accounts and Accounting rules – Accounting Concepts and Conventions – Journal – Ledger – Subsidiary books: Purchases Book, Sales Book, Purchases Returns, Sales Return book, Cash Book (Single Column, Double Column and Triple Column) - Trial balance.

**UNIT – II**

Final accounts of a sole trader with adjustments: Trading Account, Profit and loss account, Balance Sheet, Adjustments

**UNIT – III:**

Bill of exchange: Definition of bill of exchange, essentials of Bill of exchange, classification of bill of exchange, Accounting Treatment of Bill of Exchange (bill retained, bill discounted with bank, bill endorsed, bill sent for collection, renewal of bill) – Average Due Date: Meaning, determination of due date, types of problems (where amount is lent in different installments and where amount lent in single installment)

**UNIT – IV**

Accounting for consignments and Joint ventures: Consignment Meaning, definition, features, account sales, valuation of unsold stock, goods sent on consignment at cost price and invoice price, various commission to consignee.(problems)
Joint venture: Meaning, features, distinction between joint venture and partnership, joint venture and consignment, accounting treatment for joint venture(only theory)

**UNIT – V**

Depreciation - Meaning- Features- Methods- Straight Line Method– WDV Method - Annuity Method
Note: Distribution of Marks between problems and theory shall be 80% and 20%.

**TEXT BOOKS:**

1. Vinayakam N., Mani P.L., and Nagarajan K.L, 2003, **Principles of Accountancy** , S.Chand & Company Ltd., New Delhi.
2. Jain S P and Narang K L, 2000, **Advanced Accountancy**, Kalyani publishers, New Delhi.

**REFERENCE BOOKS:**

1. *Gupta R.L., Gupta V.K.* and *Shukla M.C.,* 2006, Financial Accounting, Sultan chand & sons, New Delhi.
2. *Maheswari S.K.,* and *Reddy T.S.,* 2005, **Advanced Accountancy**, Vikas publishers, New Delhi

| 15UCA43P | CORE PRACTICAL-V:<br>VB & ORACLE | SEMESTER - IV |
|---|---|---|

**Total Credits : 4**

**Hours Per Week :6**

**OBJECTIVES:**

1. To impart knowledge on Visual Basic and RDBMS
2. To learn the practical skills of Visual basic to implement real time applications
3. To understand the data base concepts using Oracle
4. To learn the knowledge on VB and oracle to access both front-end and back end applications

**CONTENTS**

1. Working with intrinsic controls.
2. Application with menus and dialog boxes
3. Application with MDI.
4. Queries Using DDL, DML.
5. Queries using Union, Intersection, Projection and Join Operation
6. Queries Using Sorting, Grouping and Nested Queries
7. Income Tax calculation
8. Pay -roll system
9. Inventory Processing System
10. Railway Reservation System.
11. Library Management System.
12. Invoice System

| 15UCA4SP | SKILL BASED PRACTICAL-1: MULTIMEDIA AND WEB DESIGNING | SEMESTER - III |
|---|---|---|

**Total Credits : 3**

**Hours Per Week :4**

**OBJECTIVES:**

1. To learn the practical skills of Photoshop
2. To design innovative presentations using Photoshop
3. To learn animation and poster design techniques

## CONTENTS

1. Working with Text, Images, and Links using Dreamweaver
2. Create Styles and Layouts with CSS.
3. Work with Web Templates & Importing a Web Site.
4. Animate Plane flying in the Clouds using Photoshop.
5. Create Plastic Surgery for Nose using Photoshop.
6. Create Web Page using Photoshop.
7. Convert Black and White to Color Photo using Photoshop.
8. Animation (tweened, motion) Using Flash
9. Adding Action scripts Using Flash
10. Create a product advertisement using Movie Maker

| 15UCA53A | CORE-VIII: DATA COMMUNICATION AND NETWORKS | SEMESTER - V |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 6**

**OBJECTIVES:**

1. To study about the physical arrangement of networks, types and modes of networks.
2. To understand the concepts of LANs, MANs, and WANs; internetworking.
3. To learn the concepts of Data transmission, data security mechanisms

## CONTENTS

**UNIT - I**

**Introduction:** Networks – Protocols and standards – Standards organizations OSI model: Functions of the layers – Line configurations – Topology – Transmission mode – Categories of networks – Internetworks- Transmission - Impairment – Performance.

**UNIT - II**

**Transmission Media:** Guided Media – Unguided Media - Error detection and correction: Types of errors – Detection –Cyclic Redundancy Check (CRC) – Check sum – Error correction: Hamming - **Data link control:** Flow control – Error control - Data link protocols.

**UNIT - III**

**LAN:** IEEE 802 – Ethernet - **Wireless LAN** : Bluetooth – **Multiple Access :** Random Access – Controlled Access - Token passing – **Channelization:** FDMA - TDMA – CDMA - **Switching:** Circuit switching – Packet switching – Message switching.

**UNIT - IV**

**Networking and internetworking Connecting Devices:** Repeaters – Bridges – Gateways – Other devices – Routing algorithms – Distance vector routing – Link state routing - **TCP / IP protocol suite:** Overview of TCP/IP- **Network layers:** Addressing – Subneting

**UNIT - V**

**Transport layer:** Process to Process Delivery- UDP –TCP - **Congestion control:** Leaky bucket algorithm – Token Bucket Algorithm - Traffic control - **Application layer:** Domain Name System (DNS) – Telnet – File Transfer Protocol (FTP) – Trivial File Transfer Protocol (TFTP) – Simple Mail Transfer Protocol (SMTP) – Simple Network Management Protocol.

**TEXT BOOKS:**

1. *Behrouz A.Forouzan. 2008*. **Data Communication and Networking**, [4th Edition], Tata McGrawHill.
2. *William Stallings. 2003*. **Data and Request Communication** [8th Edition] Pearson Education, PHI.

**REERENCE BOOKS:**

1. *Andrew Tannenbaum.S*.2000. **Computer Networks**, PHI
2. *Achyut S.Godbole.2007.* **Data Communication and Networks** [8th Edition] TMH

| 15UCA53B | CORE - IX: PROGRAMMING IN DOT NET | SEMESTER - V |
|---|---|---|

**Total Credits : 4**
**Hours Per Week : 6**

**OBJECTIVES:**

1. To enable the students to acquire basic knowledge in Dot net Programming.
2. To understand the goals and objectives of the .NET Framework.
3. To get basic knowledge and programming skill of the Dot NET Framework C# programming language.

## CONTENTS

**UNIT – I**

Understanding .NET: The C# environment - Over view of C# - Literals, Variables and Data Types - Methods in C#

**UNIT – II**

Handling Arrays-Manipulating Strings - Structures and Enumerators - Classes and Objects

**UNIT – III**

Inheritance and Polymorphism Interface-Operator Overloading - Delegates and Events

**UNIT – IV**

Managing Errors and Exceptions - Multithreading in C# - Windows and Web-based Application Development on .NET

**UNIT – V**

Web Forms in C# - Buttons – Text boxes - Labels – Literals – File Upload - Place holders – Check box – Radio buttons – Tables – Panels – Images – Image Buttons – Image Maps – List boxes – Drop-down list – hyperlinks – link buttons – Tree view – Menu – Validation Controls – Validation Groups

**TEXT BOOKS:**

1. *Balagurusamy, E.* 1999. Programming in C# A Primer, [ II Edition], Tata McGraw Hill.(Unit I – IV)
2. *Matt Telles* 2008. C# 2005 Programming - Black Book dreamtech press. (Unit V)

**REFERENCE BOOKS:**

1. *Art Gittleman*.2008. C#.Net Illustrated Viva Bark Pvt Ltd
2. *Geff Ferguson* .2007. C# Programming Bible[1st Edition] Willy India

| 15UCA5EA | ELECTIVE - I: WEB TECHNOLOGY | SEMESTER - V |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 6**

**OBJECTIVES:**

1. To inculcate knowledge web technology concepts and functioning of internet
2. To get proficient in WEB Development using HTML/XML
3. To be able to write server & client scripts
4. To get proficient in Web Management

## CONTENTS

### UNIT-I

TCP/IP: TCP/IP Basics – Why IP address – Logical Address - TCP/IP Example- The concept of IP address – Basics of TCP – Features of TCP – Relationship between TCP and IP – Ports and Sockets – Active Open and Passive Open - TCP Connections – What makes TCP reliable? – TCP Packet format - Persistent TCP connections – UDP – Differences between TCP and UDP.

### UNIT-II

DNS – E-mail – FTP – TFTP – History of WWW – Basics of WWW and Browsing - Local information on the internet – HTML – Web Browser Architecture – Web Pages and Multimedia – Remote Login (TELNET).

### UNIT-III

Introduction to Web Technology: Web pages – Tiers – Concept of a Tier – Comparison of Microsoft and Java Technologies – Web Pages – Static Web Pages – Plug-ins – Frames – Forms. Dynamic Web Pages: Need – Magic of Dynamic Web Pages – Overview of Dynamic Web Page Technologies – Overview of DHTML – Common Gateway Interface – ASP – ASP Technology – ASP Example – Modern Trends in ASP – Java and JVM – Java Servlets – Java Server Pages.

**UNIT-IV**

Active Web Pages: Active Web Pages in better solution – Java Applets – Why are Active Web Pages Powerful? – Lifecycle of Java Applets – ActiveX Controls – Java Beans. Middleware and Component-Based E-Commerce Architectures: CORBA – Java Remote Method Invocation – DCOM. EDI: Overview – Origins of EDI – Understanding of EDI – Data Exchange Standards – EDI Architecture – Significance of EDI – Financial EDI – EDI and internet.

**UNIT-V**

XML: SGML – Basics of XML – XML Parsers – Need for a standard. WAP: Limitations of Mobile devices – Emergence of WAP – WAP Architecture – WAP Stack – Concerns about WAP and its future – Alternatives to WAP.

**TEXT BOOKS:**

1. *Achyut S. Godbole & Atul Kahate,* 2003 . **Web Technologies Tcp/Ip To Internet Applications Architectures**[1st Edition]TMH.(UNIT-I toUNIT-V)

**REFERENCE BOOKS:**

1. *Rajkamal*.2010.**Internet And Web Technologies** [13th Edition]TMH.
2. *Behrouz A. Forouzan*. **Tcp/Ip Protocol Suite** [3rd Edition] TMH.

| 15UCA5EB | ELECTIVE - I:<br>SOFTWARE ENGINEERING | SEMESTER - V |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 6**

**OBJECTIVES:**

1. To learn about the systematic approach to the design, development, operating and maintenance of a software system
2. It provides knowledge in the development of software system of high quality
3. To be able to work with software development within different industrial sectors

## CONTENTS

### UNIT-I

Introduction to Software Engineering: Definitions – Size Factors – Quality and Productivity Factors. Planning a Software Project: Planning the Development Process – Planning an Organizational Structure.

### UNIT-II

Software Cost Estimation: Software cost Factors – Software Cost Estimation Techniques – Staffing-Level Estimation – Estimating Software Estimation Costs.

### UNIT-III

Software Requirements Definition: The Software Requirements specification – Formal Specification Techniques. Software Design: Fundamental Design Concepts – Modules and Modularization Criteria.

### UNIT-IV

Design Notations – Design Techniques. Implementation Issues : Structured Coding Techniques – Coding Style – Standards and Guidelines – Documentation Guidelines.

**UNIT-V**

Verification and Validation Techniques: Quality Assurance – Walkthroughs and Inspections – Unit Testing and Debugging – System Testing. Software Maintenance: Enhancing Maintainability during Development – Managerial Aspects of Software Maintenance – Configuration Management.

**TEXT BOOK:**

1. *Richard Fairley. 1997.* **Software Engineering Concepts** TMH. (UNIT-I to UNIT V)

**REFERENCE BOOKS:**

1. *Eve Anderson& Philip Greenspun& Andrew Grumet, 2006.* **Software Engineering For Internet Applications** PHI.
2. *Jeff Tian.2006.***Software Quality Engineering** [Student edition] Wiley India.

| 15UCA5EC | ELECTIVE - I : EMBEDDED SYSTEM | SEMESTER - V |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 6**

**OBJECTIVES:**

1. To provide a clear understanding on the basic concepts, Building Blocks for Embedded System
2. To teach the fundamentals of System design with Partioning
3. To introduce on Embedded Process development Environment

## CONTENTS

### UNIT-I

Introduction to Embedded System: An Embedded System – Processor in the System – Other Hardware units – Software embedded into a system – Exemplary embedded system – Embedded system on chip and in VLSI circuit. Processor and Memory organization: Structural units in a processor – Processor selection – Memory devices – Memory selection - Allocation of memory – DMA – Interfacing processor, memories and I/O devices

### UNIT-II

Devices and buses for device networks: I/O devices – Timer and counting devices – Serial communication – Host system. Device drivers and Interrupts servicing mechanism: Device drivers – Parallel port device drivers – Serial port device drivers – Device drivers for IPTD – Interrupt servicing mechanism – Context and the periods for context-switching, dead-line and interrupt latency

### UNIT-III

Programming concepts and embedded programming in C and C++: Software programming in ALP and C – C program elements – Header and source files and processor directives – Macros and functions – Data types – Data structures – Modifiers – Statements – Loops and pointers – Queues – Stacks – Lists and ordered lists – Embedded programming in C++ - Java – C program compiler and cross compiler – Source code for engineering tools for embedded C / C++ - Optimization of memory needs

**UNIT-IV**

Program modeling concepts in single and multi processor systems: Modeling process for software analysis before software implementation – Programming models for event controlled or response time constrained real time programs – Modeling of multiprocessor systems. Software engineering practices: Software algorithm complexity – Software development process life cycle and its models – Software analysis – Software design – Implementation – Testing, Validation and debugging – Software maintenance

**UNIT-V**

Inter-process communication and synchronization of processes, tasks and threads: Multiple processor – Problem of sharing data by multiple tasks and routines – Inter process communication. Real time operating systems: Operating system services – I/O subsystem – Network operating systems – Real time and embedded operating systems – Interrupt routine in RTOS environment – RTOS task scheduling – Performance metric in scheduling.

**TEXT BOOK:**

1. *Raj Kamal.* 2008. **Embedded Systems** [2nd Edition] TMH

**REFERENCE BOOK:**

1. *Steven F. Barretl.**2008.*** **Embedded System**[1st Edition] **Pearson**

| 15UCA53P | CORE PRACTICAL - VI:<br>DOT NET PROGRAMMING | SEMESTER - V |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 6**

**OBJECTIVES:**

1. To impact knowledge on Dot Net programming.
2. An understanding of how to use forms to develop GUI programs under .NET.
3. Knowledge of some of the tools available in the .NET Framework class library. (FCL)
4. Improved object-oriented programming skill through practice and insights gained by studying a new programming language

**CONTENTS**

1. Operators and expressions.
2. Looping and conditional statements.
3. Method declaration with types.
4. Inheritance.
5. Delegates and event.
6. Exceptions.
7. C# window applications using common controls.
8. C# window applications menus and tool bar controls.
9. C# web applications using text box and button controls.
10. C# web applications using check box, list box and drop down box with table .
11. C# web applications using menu controls and tree view.
12. C# web applications using validation controls.

| 15UCA5SA | SKILL BASED SUBJECT – II : CASE TOOLS CONCEPTS AND APPLICATIONS | SEMESTER - V |
|---|---|---|

**Total Credits : 3**

**Hours Per Week : 6**

**OBJECTIVES:**

1. To provide automated assistance for software development to the developers
2. The main goal of case technology is the automation of the entire information systems development life cycle process using a set of integrated software tools, such as modeling, methodology and automatic code generation.
3. To reduce the cost of software and the enhancement and quality of the software

## CONTENTS

### UNIT-I

Data Modeling: Business Growth-Organizational Model-Case Study of student MIS-What is the purpose of such Models-Understanding the business-Types of models-model development approach-the case for structural development-advantages of using a case tool. System analysis and design-what is DFD-General Rules for Drawing DFD-Difference Between Logical data flow diagram and Physical data flow diagram-Software verses Information Engineering-How case tools store information.

### UNIT-II

Approach used to solve the problem statement: How to deal with a problem statement-Data flow diagram for Payroll System-Presentation Diagram for Payroll System-sehematics of the model-Forms-Screens-Menu Screens-Data entry Screens-Report Output Format-Utilities. Installation of Ubridge and Synthesis: How to use the tools in Ubridge Systhesis for case-Installation of Ubridge Synthesis-Computer Aided Software Engineering- Getting Ubridge to work-Setup-Assign-Housekeep-The Ubridge page.

**UNIT-III**

Introduction to Ubridge: Introduction - Main flow of the system prototyping your Report- Introducing the Novice Model of the Operation. Introducing Synthesis - Synthesis basic – Synthesis - Menu Drawing the screen-Requirement Definition-Diagram-Data Dictionary-Document-Synthesis Main Administration - Synthesis reference - importing and exporting screen.

**UNIT-IV**

Diagram definition tool: Introduction-Starting DDT-Drawing your own Icon - Defining the connection rules-Rebuilding your icon. Object oriented methodologies: Rumaugh Et.Al's object modeling techniques-The Booch methodology –The Jacobson Et.Al Methodologies-Pattern-Frame works-The Unified Approach.

**UNIT-V**

Introduction to UML-UML Diagram-Class Diagram-Use Case Diagram-Interaction Diagram- Sequence Diagram-Collobration Diagram-State Chart Diagram-Activity Diagram- Component Diagram-Deployment Diagram.

**TEXT BOOKS:**

1. *Ivan N Bayross.* **Case Tools Concepts and Applications** BPB Publications [UNIT I to UNIT III]
2. *Ali Batrami***. Object Oriented System Development using the unified modeling language** Mc GraHill International editions [UNIT IV to UNIT V]

**REFERENCE BOOK:**

1. *Ivan N Bayross.* 1995.**CASE Tools Concepts and Applications** BPB Publications

| 15UCA63A | CORE - X: PHP & MySQL | SEMESTER – VI |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 5**

**OBJECTIVES:**

1. To understand the basics of Scripting Languages
2. To get knowledge on coding techniques to create Websites
3. To understand the design of Database and Database connectivity

## CONTENTS

### UNIT – I

Introducing PHP – Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables Data types – Using Constants – Manipulating Variables with Operators.

### UNIT – II

Controlling Program Flow: Writing Simple Conditional Statements - Writing More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions.

### UNIT – III

Working with Arrays: Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms - Working with Array Functions – Working with Dates and Times.

### UNIT – IV

Using Functions and Classes: Creating User-Defined Functions - Creating Classes – Using Advanced OOP Concepts. Working with Files and Directories: Reading Files-Writing Files Processing Directories.

### UNIT – V

Working with Database and SQL : Introducing Database and SQL- Using MySQL-Adding and modifying Data-Handling Errors – Using SQLite Extension and PDO Extension. Introduction XML—Simple XML and DOM Extension.

**TEXT BOOK :**

1. PHP A Beginner's Guide —, *VIKRAM VASWANI*, Tata McGraw-Hill

**REFERENCE BOOK:**

1. The PHP Complete Reference – *Steven Holzner* – Tata McGraw-Hill Edition.
2. Spring into PHP5 – *Steven Holzer*, Tata McCraw Hill Edition

| 15UCA63V | CORE - XI: PROJECT WORK | SEMESTER - VI |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 5**

## GUIDELINES FOR PROJECT WORK

- The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
- Each student should carry out individually one Project Work and it may be a work using the software packages that they have learned or the implementation of Concepts from the papers studied or implementation of any innovative idea.
- The Project work should be compulsorily done in the college only under the supervision of the Department staff concerned.
- University Exam will be conducted as follows.
- End Semester Viva
- Viva-voce will be conducted at the end of VI semester for 100 marks.
- Both the Internal ( Respective Guides) and External Examiners (50+50) should Conduct the Viva-Voce Examination at the last day of the practical session.
- Out of 50 marks, 25 for Project Evaluation and 25 for Viva.
- For awarding a pass, a candidate should have obtained 40% of the Total 100 marks.

| 15UCA6EA | ELECTIVE - II: CLOUD COMPUTING | SEMESTER - VI |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 5**

**OBJECTIVES:**

1. To Critique the consistency of services deployed from a cloud architecture
2. To manage work and personal schedules, edit digital photos and Learn how to use Web-based Applications to collaborate on cloud
3. To Evaluate the deployment of web services from cloud architecture

## CONTENTS

### UNIT – I

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Companies in the Cloud Today – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing –Who benefits from Cloud Computing .

### UNIT –II

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

### UNIT- III

Cloud Computing for the Family - Collaborating on Schedules – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

**UNIT – IV**

Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Spread Sheet - Collaborating on Databases – Collaborating on Presentations - Storing and Sharing Files.

**UNIT-V**

Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Evaluating Instant Messaging Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

**TEXT BOOK:**

1. *Michael Miller*, 2008., **Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online**, Que Publishing. (UNIT I to V)

**REFERENCE BOOKS:**

1. *Kumar Saurabh.* 2011. **Cloud Computing – Insights into New Era Infrastructure",** Wiley Indian Edition**.**
2. *Kaittwang Geoffrey C.Fox and Jack J Dongrra, Elsevier*.2012. **Distributed and Cloud Computing,**
3. *Raj Kumar Buyya***,** *Christian Vecchiola and S.Tanurai Selvi.* 2013. **Mastering Cloud Computing ,** TMH**.**

| 15UCA6EB | ELECTIVE - II: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS | SEMESTER - VI |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 5**

**OBJECTIVES:**

1. To Acquire Knowledge on various AI Techniques and Expert Systems.
2. To inculcate knowledge on expert system concepts and functioning of AI
3. To understand the Problem solving, Search, Heuristic methods

## CONTENTS

**UNIT- I**

Introduction: AI Problems – AI techniques – Criteria for success. Problems, Problem Spaces, Search: State space search – Production Systems – Problem Characteristics – Issues in design of Search.

**UNIT - II**

Heuristic Search techniques: Generate and Test – Hill Climbing – Best-First, Problem Reduction, Constraint Satisfaction, Means-end analysis.

**UNIT- III**

Knowledge representation issues: Representations and mappings – Approaches to Knowledge representations – Issues in Knowledge representations – Frame Problem.

**UNIT -IV**

Using Predicate Logic: Representing simple facts in logic – Representing Instance and Isa relationships – Computable functions and predicates – Resolution – Natural deduction.

**UNIT- V**

Representing knowledge using rules: Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge Brief explanation of Expert Systems-Definition- Characteristics-architecture- Knowledge Engineering- Expert System Life Cycle-Knowledge Acquisition Strategies- Expert System Tools.

**TEXT BOOK:**

1. *Elaine rich and Kelvin Knight*, 1991.**Artificial Intelligence,**[2nd Edition],Tata McGrawhill Publication.(UNIT I to V )**.**

**REFERENCE BOOKS :**

1. *Stuart Russell & Peter Norvig.2009.* **Artificial Intelligence a modern Approach** [2nd Edition] PHI
2. *George F Luger* , 2002**. Artificial Intelligence** [4th Edition ]TMH

| 15UCA6EC | ELECTIVE - II: COMPUTER GRAPHICS | SEMESTER - VI |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 5**

**OBJECTIVES:**

1. To provide a comprehensive introduction to computer graphics leading to the ability to understand contemporary terminology, progress, issues, and trends.
2. To form Mathematical Knowledge on Graphics and Technical background of 2D and 3D objects
3. To learn computer graphics techniques, focusing on 2D & 3D modeling, image synthesis, and rendering.

## CONTENTS

### UNIT-I

Output Primitives: Points and Lines – Line-Drawing algorithms – Loading frame Buffer – Line function – Circle-Generating algorithms – Ellipse-generating algorithms. Attributes of Output Primitives: Line Attributes – Curve attributes – Color and Grayscale Levels – Area-fill attributes – Character Attributes.

### UNIT-II

2D Geometric Transformations: Basic Transformations – Matrix Representations – Composite Transformations – Other Transformations. 2D Viewing: The Viewing Pipeline – Viewing Co-ordinate Reference Frame – Window-to-Viewport Co-ordinate Transformation - 2D Viewing Functions – Clipping Operations – Point, Line, Polygon, Curve, Text and Exterior clippings.

### UNIT-III

3D Concepts: 3D Display Methods – 3D Graphics Packages. 3D Object Representations: Polygon Surfaces – Curved lines and Surfaces – Quadric Surfaces – Super quadrics – Blobby Objects – Spline representations. 3D Geometric Modeling and Transformations: Translation – Rotation – Scaling – Other Transformations – Composite Transformations – 3D Transformation functions.

**UNIT-IV**

Visible-Surface Detection Methods: Classification of Visible-Surface algorithms – Back-Face Detection – Depth-Buffer Method – A-Buffer method- Scan-Line Method – Depth- Sorting Method – BSP-Tree Method – Area-Subdivision Method – Octree Methods – Raycasting Methods – Curved surfaces – Wire frame Methods – Visibility-Detection functions.

**UNIT-V**

Illumination Models: Properties of Light – Standard Primaries ad the Chromaticity Diagram – Intuitive color Concepts – RGB Color Model – YIQ Color Model – CMY Color Model – HSV Color Model – Conversion between HSV and RGB models – Color selection and Applications.

***TEXT BOOK:***

1. *Donald Hearn& M. Pauline Baker .2001.* **Computer Graphics [**2nd Edition], PHI. ***(UNIT I to V)***

***REFERENCE BOOKS:***

1. *Willium M. Newman &Robert F. Sproull. 2007.* **Principles Of Interactive Computer Graphics** TMH.
2. *Krishnamoorthy,N.2003.***Introduction to Computer Graphics** [6th Edition] TMH

| 15UCA6ED | ELECTIVE- III: DATA MINING | SEMESTER - VI |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 5**

**OBJECTIVES:**

1. To understand basic concepts, tasks, methods, and techniques in data mining.
2. To provide a comprehensive introduction to techniques in data mining and knowledge discovery.
3. To understanding of the data mining process and issues, learn various techniques for data mining, and apply the techniques in solving data mining problems using data mining tools and systems.

## CONTENTS

**UNIT-I**

Basic Data Mining Tasks – Data Mining Versus Knowledge Discovery in Data Bases – Data Mining Issues – Data Mining Matrices – Social Implications of Data Mining – Data Mining from Data Base Perspective.

**UNIT-II**

Data Mining Techniques – a Statistical Perspective on data mining – Similarity Measures – Decision Trees – Neural Networks – Genetic Algorithms.

**UNIT- III**

Classification : Introduction – Statistical – Based Algorithms – Distance Based Algorithms – Decision Tree – Based Algorithms – Neural Network Based Algorithms – Rule Based Algorithms – Combining Techniques.

**UNIT-IV**

Clustering : Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms . Partitional Algorithms.

**UNIT-V**

Association Rules: Introduction - Large Item Sets – Basic Algorithms – Parallel & Distributed Algorithms – Comparing Approaches – Incremental Rules – Advanced Association Rules Techniques – Measuring the Quality of Rules.

**TEXT BOOK :**

1. *Margaret H.Dunbam. 2003.* **Data Mining Introductory and Advanced Topics** Pearson Education.

**REFERENCE BOOK :**

1. *Jiawei Han & Micheline Kamber* . 2001. **Data Mining Concepts & Techniques** Academic Press.

| 15UCA6EE | ELECTIVE - III:<br>MOBILE COMPUTING | SEMESTER - VI |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 5**

**OBJECTIVES:**

1. To inculcate knowledge on Mobile Computing.
2. To understanding of mobile technologies and how these technologies are utilized and integrated to meet specific business needs.
3. To understanding of current technologies and architectures that provide the network and communications infrastructure for mobile-enabled enterprise computer systems.

## CONTENTS

### UNIT-I

Introduction: Mobility of Bits and Bytes –Wireless The Beginning – Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Application and services- Developing Mobile computer Applications – security in mobile computing – Standards _ Why is it necessary – Standard bodies. MOBILE COMPUTING ARCHITECTURE: History of computers and Internet – Architecture for mobile computing – Three-tier architecture – Design considerations for mobile computing – Mobile computing through Internet – Making exiting applications mobile enabled.

### UNIT-II

MOBILE COMPUTING THROUGH TELEPHONY: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – IVR Application – Voice XML – TAPI.

### UNIT-III

EMERGING TECHNOLOGIES: Blue Tooth – RFID – WiMAX – Mobile IP – IPv6 – Java Card. GSM : Global System for mobile communications – GSM Architecture – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – GSM Frequency allocations – Authentications and Security-SMS.

**UNIT-IV**

GPRS – GPRS and packet data network – GPRS network architecture – GPRS network operations – Data services in GPRS – Application for GPRS- Limitations – Billing and Charging. WAP : MMS – GPRS Applications.

**UNIT-V**

CDMA and 3G: Spread spectrum technology – Is 95 – CDMA vs GSM – Wireless Data – Third generation networks – Applications on 3G WIRELESS LAN: Wireless LAN advantages – IEEE 802.11 standards – Architecture – Mobile in Wireless LAN – Deploying wireless LAN – Mobile adhoc networks and sensor networks – Wireless LAN Security – WiFi vs 3G.

**TEXT BOOK:**

1. *Asoke K Talukder& Roopa R Yavagal*.2005. **Mobile Computing**, TMH(UNIT I –UNIT V).

**REFERENCE BOOK:**

1. *Raj Kamal.* 2007. **Mobile Computing** [2nd Edition] Oxford Higher Education.

| 15UCA6EF | ELECTIVE- III:<br>DIGITAL IMAGE PROCESSING | SEMESTER - VI |
|---|---|---|

**Total Credits : 4**

**Hours Per Week : 5**

**OBJECTIVES:**

1. To study the image fundamentals and mathematical transforms nec essary for image processing.
2. To study the image enhancement techniques
3. To study image restoration procedures and image compression procedures.

## CONTENTS

### UNIT - I Digital Image Fundamentals

Introduction – Origins of Digital Image Processing - Fundamental Steps in DIP – Components of an Image Processing System – Elements of Visual Perception - Image Sensing and acquisition – Image Sampling and Quantization- Linear and nonlinear Operations.

### UNIT - II Image enhancement in the Spatial Domain

Some basic gray level transformations – histogram processing – Enhancement using arithmetic / logic operations – basics of spatial filtering – Smoothing spatial filtering – sharpening spatial filtering – Combining spatial enhancement methods.

### UNIT - III Image restoration

A model of the image degradation / restoration process – noise models – restoration in the presence of noise only-spatial filtering – periodic noise reduction by frequency domain filtering – linear, position–invariant degradations – estimating the degradation functions – inverse filtering – minimum mean square error(winner) filtering – constrained least square filtering – geometric mean filter – geometric transformations.

### UNIT - IV Image compression

Fundamentals – image compression models, elements of information theory – error-free compression – lossy compression – image compression standards.

**UNIT - V Image segmentation**

Detection of discontinuities – edge linking and boundary detection – thresholding – region based segmentation – segmentation by morphological watersheds – the use of motion in segmentation.

**TEXT BOOK:**

1. *Gonzalez, R.C & Woods R.E.* 2002. **Digital Image Processing** [2nd Edition] Pearson Education(Unit I –Unit V).

**REFERENCE BOOKS**:

1. *Sid Ahmed*, 1995. **Image Processing**, McGraw Hill, New York.
2. *Milan Sonka& Vaclav Hlavac & Roger Boyle,* 1999. **Image processing Analysis and Machine vision** [Second Edition] Thomson Brooks/Cole.

| 15UCA63P | CORE PRACTICAL - VII:<br>PHP & MySQL Programming | SEMESTER - VI |
|---|---|---|

**Total Credits : 4**
**Hours Per Week : 5**

**OBJECTIVES:**

1. To learn the practical skills on PHP and MySQL
2. Gain the PHP programming skills needed to successfully build interactive, data-driven sites
3. PHP Programming & MySQL for Web Development course the delegate will have a good practical knowledge of how to write successful HTML/PHP code utilizing a MySQL database

**CONTENTS**

1. Controls and Functions
2. Message passing mechanism between pages.
3. String function
4. Arrays.
5. Parsing functions (use Tokenizing)
6. Regular Expression, HTML functions, Hashing functions.
7. Built-in Functions (File , Network Date and time functions).
8. Cookie and Session
9. User Interface Design to store data in database
10. Queries in Database
11. Report Generation
12. Student personal information system

| 15UCA6SP | SKILL BASED PRACTICAL – II : CASE TOOLS | SEMESTER - VI |
|---|---|---|

**Total Credits : 3**

**Hours Per Week : 5**

**OBJECTIVES:**

1. Model helps us to visualize a system as it is.
2. Model permit us to specify the structure or behavior of a system.
3. Model gives us a template guides us in constructing a system.

## CONTENTS

1. To design an ATM transfer system using UML diagram and to generate VB code.
2. To design a student mark analysis using UML diagram and to generate VB code.
3. To design a platform assignment system using UML diagram and to generate VB code.
4. To design a railway reservation system using UML diagram and to generate VB code.
5. To design an expert system for medicine field using UML diagram and to generate VB code.
6. To design a stock maintenance system using UML diagram and to generate VB code.
7. To design a quizzing system using UML diagram and to generate VB code.
8. To design a remote computer monitoring system using UML diagram and to generate VB code.
9. To design an online ticket reservation system using UML diagram and to generate VB code.
10. To design an E-mail client server system using UML diagram and to generate VB code.
11. To design a Library information system using UML diagram and to generate VB code.
12. To design any Banking service system using UML diagram and to generate VB code.

| 15UED34M | NMEC- I : SECURITY IN COMPUTING | SEMESTER -III |
|---|---|---|

**Total Credits : 2**

**Hours Per Week : 2**

**OBJECTIVES:**

1. To give more and more visibility to effect of computer security on our daily lives
2. To Entails serious risks to the privacy and integrity of our data
3. To mind all sorts of issues that refer to data protection and prevention of unauthorized access

## CONTENTS

**UNIT- I**

Security Problem in Computing : What Does "Secure" Mean? - Attacks - The Meaning of Computer Security - Computer Criminals.

**UNIT -II**

Program Security: Secure Programs – Non malicious Program Errors - Viruses and Other Malicious Code.

**UNIT -III**

Protection in General - Purpose Operating Systems: Protected Objects and Methods of Protection - Memory and Address Protection - File Protection Mechanisms.

**UN IT -IV**

Database and Data Mining Security: Introduction to Databases - Security Requirements - Reliability and Integrity.

**UNIT-V**

Security in Networks: Network Concepts - Threats in Networks Network Security Controls- Firewalls.

**TEXT BOOK:**

1. ***Charles.P Pfleeger & Shari Lawrence Pfleeger.*** **Security in Computing[ 4th Edition]** Eastern Economy Edition(UNIT I to V)

**REFERENCE BOOKS:**

1. ***Brijendra Singh*** **.Network security and Management [ Second Edition]** Eastern Economy Edition
2. ***William stallings .2004*** **.Network security essentials**[5th Indian Reprint] Pearson education

| 15UED44M | NMEC - II : BIG DATA ANALYTICS | SEMESTER - IV |
|---|---|---|

**Total Credits : 2**

**Hours Per Week :2**

**OBJECTIVES:**

1. To explore the fundamental concepts of big data analytics
2. To learn to analyze the big data using intelligent techniques.
3. To understand the applications using Map Reduce Concepts.

## CONTENTS

**UNIT- I**

Introduction to Big Data Platform – Challenges of Conventional Systems - Intelligent data analysis – Nature of Data - Analytic Processes and Tools - Analysis vs. Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

**UNIT –II**

History of Hadoop- The Hadoop Distributed File System – Components of Hadoop- Analyzing the Data with Hadoop- Scaling Out

**UNIT – III**

Hadoop Streaming- Design of HDFS-Java interfaces to HDFS- Basics-Developing a Map Reduce Application-How Map Reduce Works

**UNIT – IV**

Hadoop Environment - Setting up a Hadoop Cluster - Cluster specification - Cluster Setup and Installation - Hadoop Configuration-Security in Hadoop.

**UNIT – V**

Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive - fundamentals of HBase and ZooKeeper.

**TEXT BOOKS :**

1. *Michael Berthold, David J. Hand,* 2007 . **Intelligent Data Analysis,** Springer,
2. *Tom White.* 2012 **Hadoop: The Definitive Guide** Third Edition, O'reilly Media,

**REFERENCE BOOKS:**

1. *Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulo.* 2012 **Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data,** McGrawHill Publishing.
2. *Bill Franks.* 2012 **Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics,** John Wiley & Sons.

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