## NEHRU ARTS AND SCIENCE COLLEGE
**(Autonomous)**

**(Reaccredited With "A" Grade by NAAC, ISO 9001: 2008 & 14001: 2004 Certified Recognized by UGC with 2(f) & 12(B) and Affiliated to Bharathiar University) Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu.**

## DEPARTMENT OF COMPUTER APPLICATIONS

## PROGRAMME OUTCOMES

On successful completion of the programme, the graduates will have

| | |
|---|---|
| PO1 | **Critical Thinking:** Understand the fundamental concepts of Computers, Business environment and IT application and business. |
| PO2 | **Design/Development of Solution:** Understand & analyze technical data to reach actionable conclusions, including technological solutions to the business. |
| PO3 | **Modern Tool Usage:** Learn technologies & Programming languages in addressing problems. |
| PO4 | **The Social interaction:** Develop competent technical writing skills so as to enable the graduate to have effective communication in business. |
| PO5 | **Environment and Sustainability:** Gain the attitude of continuous learning and deriving innovative ideas. |
| PO6 | **Ethics:** Apply ethical principle and commit to professional ethics responsibilities as per the norms of the IT industry |
| PO7 | **Individual and Team Work:** Adopt team building environment and will be a good team player. |
| PO8 | **Communication:** Create improved communication and business management skills, especially in providing technical support. |
| PO9 | **Project management and finance:** Attain clarity on both conceptual and application-oriented skills in commerce, Finance & Accounting and IT Applications in Business context. |
| PO10 | **Lifelong learning:** Update technologies continuously. |

## PROGRAMME SPECIFIC OUTCOMES (PSOs)

After the successful completion of the programme, the students are expected to

| | |
|---|---|
| **PSO1** | Obtain ability to specify, design, develop, test and maintain usable software systems that behave reliably and efficiently and satisfy all the requirements that customers have defined for them. |
| **PSO2** | Gain skill to develop software systems that would perform tasks related to Research, Education and Training and/or E-governance |
| **PSO3** | Expertise in determining and optimizing the performance of a given algorithm on a given platform. |
| **PSO4** | Acquire capability to anticipate the changing direction of information technology and evaluate and communicate the likely utility of new technologies to an individual or organization |
| **PSO5** | Make the students capable in decision making at personal and professional level. |

## PROGRAM EDUCATIONAL OBJECTIVES

After 3 years of the programme, the graduates are expected to attain

| | |
|---|---|
| **PEO1** | Graduate will be competent enough to identify, analyze, design and develop software solutions to the problems in the field. |
| **PEO2** | Graduates, equipped with good communication skills and technical expertise will be able to conceptualize and lead projects with an aim to become effective entrepreneurs or employees. |
| **PEO3** | Graduates, with exposure to highly active research environment, will have the motivation to participate and contribute in research and development. |

# NEHRU ARTS AND SCIENCE COLLEGE

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**Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu.**

## Scheme of Examination
**(Applicable to the students admitted during the year 2021-2022)**
### BACHELOR OF COMPUTER APPLICATIONS

| SEMESTER | Part | Course Code | Name of the Course | Instruction hours / week | Duration Hours | CIA | ESE | Total | Credits |
|----------|------|-------------|--------------------|--------------------------|----------------|-----|-----|-------|---------|
| I | I | 21U1TAM101/ 21U1HIN101/ 21U1MAL101/ 21U1FRN101 | Language - I | 5 | 3 | 50 | 50 | 100 | 4 |
| | II | 21U2ENG101 | English – I | 5 | 3 | 50 | 50 | 100 | 4 |
| | III | 21U3CKC101 | Core Paper I:  Python Programming | 4 | 3 | 50 | 50 | 100 | 4 |
| | III | 21U3CKC102 | Core Paper II: Digital Fundamentals and Computer Architecture | 4 | 3 | 50 | 50 | 100 | 4 |
| | III | 21U3CAP101 | Core Paper III: Practical in Python Programming | 4 | 3 | 50 | 50 | 100 | 4 |
| | III | 21U3MIA101 | Allied Paper I: Mathematics for Computer Science | 5 | 3 | 50 | 50 | 100 | 4 |
| | IV | 21U4ENV101 | Ability Enhancement Compulsory Course: Environmental Studies | 2 | 3 | 50 | - | 50 | 2 |
| | IV | 21U4HVY201 | Value Education: Human Values and Yoga Practice I | 1 | - | - | - | - | - |
| | | | | **30** | | | | **650** | **26** |
| II | I | 21U1TAM202/ 21U1HIN202/ 21U1MAL202/ 21U1FRN202 | Language – II | 5 | 3 | 50 | 50 | 100 | 4 |
| | II | 21U2ENG202 | English – II | 5 | 3 | 50 | 50 | 100 | 4 |
| | III | 21U3CKC203 | Core Paper IV: Java Programming | 4 | 3 | 50 | 50 | 100 | 4 |
| | III | 21U3CKC204 | Core Paper V: Data Structures | 4 | 3 | 50 | 50 | 100 | 4 |
| | III | 21U3CAP202 | Core Paper VI: Practical in Java Programming | 4 | 3 | 50 | 50 | 100 | 4 |
| | III | 21U3MIA202 | Allied Paper II: Discrete Mathematics | 5 | 3 | 50 | 50 | 100 | 4 |

| | IV | 21U4HRC202 | Ability Enhancement Compulsory Course: Human Rights and Constitution of India | 2 | 3 | 50 | - | 50 | 2 |
|---|---|---|---|---|---|---|---|---|---|
| | IV | 21U4HVY201 | Value Education: Human Values and Yoga Practice I | 1 | 2 | 50 | - | 50 | 2 |
| | | | | **30** | | | | **700** | **28** |
| III | III | 21U3CKC305 | Core Paper VII: Operating Systems | 5 | 3 | 50 | 50 | 100 | 4 |
| | III | 21U3CAC303 | Core Paper VIII: RDBMS and Oracle | 5 | 3 | 50 | 50 | 100 | 4 |
| | III | 21U3CAP304 | Core Paper IX: Practical in Oracle Programming | 6 | 3 | 50 | 50 | 100 | 4 |
| | III | 21U3MIA303 | Allied Paper III: Operations Research | 5 | 3 | 50 | 50 | 100 | 4 |
| | IV | 21U4CAZ301 | Skill Based Paper I: Practical in Multimedia and its Applications | 4 | 3 | 30 | 45 | 75 | 3 |
| | IV | 21U4NM3BT1 / 21U4NM3AT1/ 21U4NM3CAF/ 21U4NM3GTS/ 21U4NM3WRT | # @Basic Tamil – I / ##Advanced Tamil – I / * NME: Consumer Affairs / Gandhian Thoughts / Women's Rights | 2 | 3 | 50 | | 50 | 2 |
| | IV | 21U4CK3ED1/ 21U4CK3ED2 | Extra Departmental Course | 2 | 3 | - | 50 | 50 | 2 |
| | IV | 21U4HVY402 | Value Education: Human Values and Yoga Practice II | 1 | - | - | - | - | - |
| | IV | 21U4CAVALC | **Skill Enhancement: Value Added Course - Institute Industry Linkage | - | - | - | - | - | - |
| | | | | **30** | | | | **575** | **23** |
| IV | III | 21U3CAC405 | Core Paper X: Visual Programming | 5 | 3 | 30 | 45 | 75 | 3 |
| | III | 21U3CKC408 | Core Paper XI: Software Engineering | 6 | 3 | 50 | 50 | 100 | 4 |
| | III | 21U3CAP406 | Core Paper XII: Practical in Visual Programming | 6 | 3 | 50 | 50 | 100 | 4 |
| | III | 21U3BAA404 | Allied Paper IV: Accounting for Cost and Management | 6 | 3 | 50 | 50 | 100 | 4 |
| | IV | 21U4CAZ402 | Skill Based Paper II: Practical in Web Programming using PHP and MySQL | 4 | 3 | 30 | 45 | 75 | 3 |
| | IV | 21U4NM4BT2 / 21U4NM4AT2/ 21U4NM4GEN | # @Basic Tamil – II / ##Advanced Tamil - II / General Awareness | 2 | 3 | 50 | | 50 | 2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| IV | 21U4HVY402 | Value Education: Human Values and Yoga Practice II | 1 | 2 | 50 | - | 50 | 2 |
| IV | 21U4CAVALC | ** Skill Enhancement: Value Added Course - Institute Industry Linkage | - | - | - | - | - | Grade |
| | | | **30** | | | | **550** | **22** |
| V | III | 21U3CAC507 | Core Paper XIII: Computer Networks | 5 | 3 | 50 | 50 | 100 | 4 |
| III | 21U3CAC508 | Core Paper XIV: Object Oriented System and Design | 5 | 3 | 50 | 50 | 100 | 4 |
| III | 21U3CAC509 | Core Paper XV: Computer Graphics and Image Processing | 5 | 3 | 30 | 45 | 75 | 3 |
| III | 21U3CAP510 | Core Paper XVI: Practical in Case Tools | 5 | 3 | 50 | 50 | 100 | 4 |
| III | 21U3CKE501/ 21U3CKE502 21U3CKE503/ 21U3CKE504 | Discipline Specific Elective Paper – I | 6 | 3 | 50 | 50 | 100 | 4 |
| IV | 21U4CAZ503 | Skill Based Paper III: Practical in Internet of Things | 4 | 3 | 30 | 45 | 75 | 3 |
| III | 21U3CAV511 | In-plant Training | - | - | 50 | - | 50 | 2 |
| | | | **30** | | | | **600** | **24** |
| VI | III | 21U3CKC609 | Core Paper XVII: Data Mining | 6 | 3 | 50 | 50 | 100 | 4 |
| III | 21U3CAV612 | Project and Viva-Voce | 6 | - | 50 | 50 | 100 | 4 |
| III | 21U3CKE605/ 21U3CKE606/ 21U3CKE607/ 21U3CKE608 | Discipline Specific Elective Paper - II | 6 | 3 | 50 | 50 | 100 | 4 |
| III | 21U3CAE609/ 21U3CAE610/ 21U3CAE611/ 21U3CAE612 | Discipline Specific Elective Paper - III | 6 | 3 | 50 | 50 | 100 | 4 |
| IV | 21U4CAZ604 | Skill Based Paper IV: Practical in R Programming | 6 | 3 | 30 | 45 | 75 | 3 |
| V | 21U5EXT601 | Extension Activities | - | - | 50 | - | 50 | 2 |
| | | | **30** | | | | **525** | **21** |
| | | **Total** | **180** | | | | **3600** | **144** |
| | | **Additional Credit Optional (II-V)** | | | | | | **8$** |

# Basic Tamil -Students who have not studied Tamil up to 12th standard.

##Advance Tamil – Students who have studied Tamil language up to 12th standard and chosen other languages under part I of the UG programme but would like to advance their Tamil language skills.

* NME – Student shall choose any one course out of three courses.

@ No End Semester Examinations. Only Continuous Internal Assessment (CIA)

**$ -** Not included in Total marks and CGPA Calculation

** Examination and Evaluation for value added course shall be conducted by the Industry and the marks shall be submitted to the Controller of Examination for the award of the degree.

**ELECTIVE PAPERS:**

| Elective Papers | Course Code | Name of the Course |
|---|---|---|
| Elective Paper - I | 21U3CKE501 | Blockchain Technology |
| | 21U3CKE502 | Next Generation Networks |
| | 21U3CKE503 | Internet of Things |
| | 21U3CKE504 | Big Data Analytics |
| Elective Paper - II | 21U3CKE605 | Software Quality Assurance |
| | 21U3CKE606 | Information Security |
| | 21U3CKE607 | Cloud Computing |
| | 21U3CKE608 | Cyber Security |
| Elective Paper - III | 21U3CAE609 | Artificial Intelligence |
| | 21U3CAE610 | Software Project Management |
| | 21U3CAE611 | Bioinformatics |
| | 21U3CAE612 | Mobile Application Development |

**EXTRA DEPARTMENTAL COURSE**

| S. No. | Semester | Course Code | Course Title |
|---|---|---|---|
| 1 | III | 21U4CK3ED1 | Multimedia Tools - Practical |
| 2 | | 21U4CK3ED2 | Web Development using HTML - Practical |

**Self-Study Paper offered by Department of Computer Applications:**

| S. No. | Semester | Course code | Course Title |
|---|---|---|---|
| 1 | Semester II to V | 21UCASS01 | Problem Solving and Programming |
| 2 | | 21UCASS02 | Web Design Using HTML |

Chairman
Board of Studies in Computer Science
Nehru Arts and Science College
Coimbatore.

BoS - Chairman
Department of Computer Science
Nehru Arts and Science College
(Autonomous)
Coimbatore - 641 105.

| Course Code | Title | | |
|---|---|---|---|
| **21U1TAM101** | **Part I – Tamil - I** | | |
| **Semester : I** | **Credits : 4** | **CIA : 50 Marks** | **ESE : 50 Marks** |

**(Common to all UG Programmes)**

**Course Objective** : மொழி இலக்கியத்தின் வாயிலாக அறம் சார் பண்பு மற்றும் ஆளுமை மிக்க மாணவர்களை உருவாக்குதல்

**Course Outcomes** :

| CO1 | தமிழ் இலக்கியங்கள் வாயிலாக சமூகச் சீர்திருத்தச் சிந்தனைகள் பெறப்படும். |
|---|---|
| CO2 | அற இலக்கியங்களின் வழி தமிழர்களின் வாழ்வியல் பண்புகளைக் கற்று அறிதல். |
| CO3 | பெண்ணியக் கவிஞர்களின் படைப்புத் திறனை மாணவர்களுக்கு உணர்த்துதல் |
| CO4 | சிறுகதைகளின் வழி சமூக கருத்துகளை மாணவர்களுக்கு அறிவுறுத்தல் |
| CO5 | தமிழ் இலக்கிய வரலாற்றுத் திறனை வளர்த்தல் |

**Offered by :** தமிழ்த்துறை

**Course Content**                                    **Instructional Hours / Week : 5**

| Unit | Description | |
|---|---|---|
| | சங்க இலக்கியம் | |
| **I** | 1. ஐங்குறுநூறு - கிள்ளைப்பத்து (281-290) பாடல்கள்<br>2. பதிற்றுப்பத்து - இரண்டாம் பத்து (11 -15 ஐந்து பாடல்கள்)<br>3. பத்துப்பாட்டு - முல்லைப்பாட்டு - முல்லைப்பாட்டு முழுவதும் (1-103 வரிகள்)<br>4. சிறுபாணாற்றுப்படை - சேரநாட்டின் வளமை | |
| | **Instructional Hours** | **15** |
| | அற இலக்கியம் - நீதிநூல்கள் | |
| **II** | 1. அறன் வலியுறுத்தல் - (31-40 குறட்பாக்கள்)<br>2. புகழ் - (231 - 240 குறட்பாக்கள்)<br>3. வாய்மை - (291 - 300 குறட்பாக்கள்)<br>4. நாலடியார் - பொருட்பால் 11 ஆவது அதிகாரம் (கூடா நட்பு 1 - 10)<br>5. நான்மணிக்கடிகை - முதல் ஐந்து பாடல்கள் | |
| | **Instructional Hours** | **15** |
| | பெண்ணியம் | |
| **III** | 1. பூச்சி வாழ்க்கை - ஆண்டாள் பிரியதர்சனி (சுயம் பேசும் கிளி)<br>2. தொட்டிச்செடி - கவிஞர் இளம்பிறை<br>3. அம்மா - சுகிர்தராணி<br>4. நீரில் அலையும் முகம் - அ.வெண்ணிலா | |
| | **Instructional Hours** | **15** |
| | சிறுகதைகள் | |
| **IV** | 1. குட்டி ரேவதி - நிறைய அறைகள் உள்ள வீடு<br>2. ஜெயமோகன் - யானை டாக்டர்<br>3. ச.தமிழ்ச்செல்வன் - வெயிலோடு போய்<br>4. வண்ணநிலவன் - எஸ்தர்<br>5. உமா மகேஸ்வரி - மரப்பாச்சி | |
| | **Instructional Hours** | **15** |
| | தமிழ் - இலக்கிய வரலாறு | |
| **V** | 1. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்<br>2. சிறுகதையின் தோற்றமும் வளர்ச்சியும்<br>3. படிமம் குறியீடு பற்றிய - விளக்கம் | |
| | **Instructional Hours** | **15** |
| | **Total Hours** | **75** |

பாடத்தொகுப்பு

இளங்கலை முதலாம் ஆண்டு தமிழ் மாணவர்களுக்குரிய பாடநூல் **"இளந்தளிர்"**
தொகுப்பு: தமிழ்த்துறை ,நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்

## பார்வை நூல்கள்

1. ஐங்குநூறு - உரையாசிரியர் ஒளவை துரைசாமிப்பிள்ளை, பதிப்பாசிரியர்கள் முதுமுனைவர் இரா.இளங்குமரனார், முனைவர்.பி.தமிழகன் தமிழ் மண் அறக்கட்டளை, சென்னை.17

2. திருவள்ளுவர் - திருக்குறள் பரிமேலழகர் உரை, சாரதா பதிப்பகம், ஜி - 4 சாந்தி அடுக்ககம், ஸ்ரீ கிரு்்ணாபுரம் தெரு, இராயப்பேட்டை, சென்னை - 014

3. ஆண்டாள் பிரியதர்ீனி - சுயம் பேசும் கிளி கவிதைத் தொகுப்பு, ராகவேந்திரா வெளியீடு 163 2 பொன்விழா அச்சகம், பொன்னி வெளியீடு, பாக்குட்டசாலை, அண்ணாநகர், சென்னை.

4. கவிஞர் இளம்பிறை - தொட்டிச்செடி, பொன்னி வெளியீடு, சென்னை - 91

5. சுகிர்தராணி - தீண்டப்படாதமுத்தம், காலச்சுவடு பதிப்பகம், நாகர்கோயில்.

6. அ.வெண்ணிலா - நீரில் அலையும் முகம் முதல் கவிதைத் தொகுப்பு - 2000

7. தமிழண்ணல் - புதியநோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை - 625 001.

8. நிறைய அறைகள் உள்ளவீடு - குட்டிரேவதி எழுத்து பிரசுரம் 11மாடல் நகர் 10 வது வீதி, சென்னை.

9. யானை டாக்டர் - ஜெயமோகன் வம்சி பதிப்பகம் நியு செஞ்சுரி புக்கவுஸ் சென்னை.

10. வெயிலோடு போய் - ச.தமிழ்ச்செல்வன் சிறுகதைகள் தொகுப்பு பாரதி புத்தகாலயம் 7 இளங்கோ சாலை சுப்பராயன் நகர் சென்னை

11. எஸ்தர் - வண்ணநிலவன் சிறுகதைகள், நற்றிணைப் பதிப்பகம், 172, ஆர்கட் ரோடு, கன்னினாபுரம் வடபழனி - 2

12. மரப்பாச்சி - உமா மகேஸ்வரி, தமிழினி பதிப்பகம், 342 டி.டி.கே சாலை, சென்னை.14

## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Seminar | Assignment | Group Project | Total |
|-------|--------|---------|---------|------------|---------------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | - | - | H | - | H | H | M | H | - | - | - | - | L |
| CO2 | - | - | M | - | H | L | H | H | - | - | - | - | L |
| CO3 | - | - | L | - | M | M | H | H | - | - | - | - | L |
| CO4 | - | - | H | - | H | M | M | L | - | - | - | - | L |
| CO5 | - | - | H | - | H | L | H | H | - | - | - | - | L |

H-High; M-Medium; L-Low;

| Course Designed by | Verified by | Checked by | Approved by |
|--------------------|-------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| 21U1HIN101 | PART – I : HINDI - I | | |
| Semester : I | Credits:4 | CIA : 50 Marks | ESE : 50 Marks |

(Common to all UG Programmes)

कोर्स   लक्ष्य         : छात्र–छात्राओं में राष्ट्रीय भावना का विकास करना तथा राष्ट्रभाषा हिंदी एवं उससे संबंधित साहित्य की जानकारी प्रदान करना

कोर्स   परिणाम       :

| CO1 | सामाजिक, सांस्कृतिक और राजनैतिक परिवेश से छात्र. साहित्य के माध्यम से बोधवान होंगे। |
|---|---|
| CO2 | व्याकरण के शिक्षण के माध्यम से छात्रों में शुद्ध भाषा में बोलने की क्षमता को विकसित होगी। |
| CO3 | अंतर्राष्ट्रीय भाषा अंग्रेज़ी से राष्ट्रभाषा हिंदी में सामग्री का अनुवाद करके छात्र हिंदी की ज्ञान संपदा बढ़ाने में कामयाब होंगे। |
| CO4 | विविध अनुशासनों में अनुवादों को सुचारु बनाने के लिए पारिभाषिक शब्दावली का ज्ञान होगा। |
| CO5 | विद्यार्थी हिन्दी में अच्छा बोल सकेंगे। |

**Offered by : Hindi Department**

अध्ययन विषयवस्तु                                                                 निर्देशात्मक घंटे / सप्ताह: 5

| इकाई | विवरण | |
|---|---|---|
| I | लडाई–सर्वेश्वरदयाल सक्सेना | |
| | निर्देशात्मक घंटे | 20 |
| II | एकांकी संग्रह – 1. शिवाजी का सच्चा स्वरूप (सेठ गोविन्ददास) 2. माँ  (विष्णु प्रभाकर) 3. घोंसले 4. रीढ़ की हड्डी  (जगदीशचन्द्र माथुर) 5. सिपाही की माँ. मोहन राकेश | |
| | निर्देशात्मक घंटे | 20 |
| III | व्याकरण : संज्ञा, सर्वनाम, विशेषण, क्रिया, वचन, लिंग, काल, वाच्य, प्रत्यय, उपसर्ग, 'ने' का प्रयोग | |
| | निर्देशात्मक घंटे | 15 |
| IV | अनुवाद : अंग्रेज़ी–हिंदी (अनुवाद अभ्यास–3) (1-15) | |
| | निर्देशात्मक घंटे | 10 |
| V | पारिभाषिक शब्दावली | |
| | निर्देशात्मक घंटे | 10 |
| | कुल घंटे | 75 |

पाठ्यपुस्तक**:**

1. **लडाई** : सर्वेश्वरदयाल सक्सेना
2. **एकांकी संग्रह**
3. **अनुवाद अभ्यास—३**, दक्षिण भारत हिंदी प्रचार सभा, चेन्नै—17.
4. **आलेखन व टिप्पणी**

संदर्भ ग्रंथ :

1. डॉ. एन.ई. विश्वनाथ अय्यर, **अनुवाद कला,** पब्लिशर, संस्करण 2000
2. भोलानाथ तिवारी, **अनुवाद विज्ञान,** संस्करण 2000
3. रामदेव, **व्याकरण प्रदीप।** प्रकाशन : हिंदी भवन, 36, टागौर टाउन, इलहाबाद —2
4. **नूतन गद्य संग्रह**, सुमित्रा प्रकाशन, सुमित्रा निवास, 16 / 4 हास्टिंग्स रोड, इलहाबाद —211 001. संस्करण 2006

## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Project | Total |
|-------|--------|---------|------------|---------|---------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| POS<br>COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | - | - | H | - | L | M | M | - | - | - | - | - | L |
| CO2 | - | - | M | - | L | M | H | - | - | - | - | - | L |
| CO3 | - | - | M | - | M | H | L | - | - | - | - | - | L |
| CO4 | - | - | H | - | - | M | - | - | - | - | - | - | L |
| CO5 | - | - | M | - | - | - | H | - | - | - | - | - | L |

H-High; M-Medium; L-Low

| Course Designed by | Verified by HoD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| **21U1MAL101** | **Part - I : Malayalam - I** | | |
| **Semester : I** | **Credit : 4** | **CIA : 50 Marks** | **ESE : 50 Marks** |

**(Common to all UG Programmes)**

**Course Objective** : ആധുനികാലത്തെ മലയാളകഥകളെ കുറിച്ചും സംസ്കാരത്തെ കുറിച്ചും അവബോധം ഉണ്ടാക്കുന്നു

**Course Outcomes:**

| CO1 | കഥ യുടെ സംവേദനം ആസ്വാദകന്റെ അഭിരുചിയെ പൂർത്തിയാക്കുന്നു |
|---|---|
| CO2 | പ്രകൃതിയുമായി ബന്ധപ്പെടുന്ന കഥാപരിസരം |
| CO3 | ഭക്ഷണവും അതിന്റെ സംസ്കാരവും കൂട്ടായ്മ ഉണ്ടാക്കുന്നു |
| CO4 | ഭക്ഷണത്തിന്റെ മൂല്യം അർത്ഥവത്താക്കുന്നു |
| CO5 | ആശയ വിപുലനം |

**Offered by : Malayalam Department**

**Course Content**                                        **Instructional Hours/Week: 5**

| Unit | Description | |
|---|---|---|
| **I** | ചെറുകഥകൾ - സമകാല കഥകൾ | |
| | **Instructional Hours** | **15** |
| **II** | ചെറുകഥകൾ - സമകാല കഥകൾ | |
| | **Instructional Hours** | **15** |
| **III** | സംസ്കാര പഠനം | |
| | **Instructional Hours** | **15** |
| **IV** | സംസ്കാര പഠനം | |
| | **Instructional Hours** | **15** |
| **V** | ഉപന്യാസം, വിവർത്തനം, ആശയവിപുലനം | |
| | **Instructional Hours** | **15** |
| | **Total Hours** | **75** |

പാഠപുസ്തകങ്ങൾ :

1. ചെറുകഥകൾ - സമകാല ചെറുകഥകൾ (10 ചെറുകഥകൾ)
2. സംസ്കാര പഠ നം കേരള ഭക്ഷണത്തിന്റെ സംസ്കാരചരിത്രം ഡോ.സി. ഗണേഷ്, ഡി.സി.ബുക്സ് കോട്ടയം

സഹായകഗ്രന്ഥങ്ങൾ :

1. എം അച്യുതൻ - ചെറുകഥ ഇന്നലെ ഇന്ന് - ഡി.സി.ബുക്സ് കോട്ടയം
2. എരുമേലി പരമേശ്വരൻ പിള്ള - മലയാള സാഹിത്യം കാലഘട്ടങ്ങളിലൂടെ - ഡി.സി.ബുക്സ് കോട്ടയം

3. പുതിയ കഥ പുതിയ വായന - എഡി : ഡോ.ഷീബാ ദിവാകരൻ  പുസ്തകലോകം പ്രസദ്ധീകരണം

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Group Project | Total |
|-------|--------|---------|------------|---------|---------------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | - | - | H | M | H | H | - | - | - | - | - | - | L |
| CO2 | - | - | H | L | H | M | - | - | - | - | - | - | L |
| CO3 | - | - | - | M | M | H | - | - | - | - | - | - | L |
| CO4 | - | - | L | M | L | H | - | - | - | - | - | - | L |
| CO5 | - | - | L | - | H | - | - | - | - | - | - | - | L |

H-High;  M-Medium;  L-Low

| Course designed by | Verified by | Checked by | Approved by |
|--------------------|-------------|------------|-------------|
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| **21U1FRN101** | **Part - I : French - I** | | |
| **Semester : I** | **Credits : 4** | **CIA : 50 Marks** | **ESE: 50 Marks** |

**(Common to all UG Programmes)**

**Course Objective:**

Acquisition of standard French through fundamental French grammar.

**Course Outcomes:**

Students will be able to

| CO1 | Learn basic French grammar along with French civilisation |
|---|---|
| CO2 | Know the gender of nouns |
| CO3 | Learn Negation, articles and understand the usage of preposition. |
| CO4 | Learn Futur proche, Pronominal verb, |
| CO5 | Know to self introduce and translate simple sentences. |

**Offered by : French Department**

**Course Content**                               **Instructional Hours/Week : 5**

| Unit | Description | |
|---|---|---|
| **I** | Mes cinq sens en action | |
| | **Instructional Hours** | **15** |
| **II** | S'ouvrir aux autres | |
| | **Instructional Hours** | **15** |
| **III** | Partager son lieu de vie | |
| | **Instructional Hours** | **15** |
| **IV** | Vivre au quotidien | |
| | **Instructional Hours** | **15** |
| **V** | S'ouvrir a la culture | |
| | **Instructional Hours** | **15** |
| | **Total Hours** | **75** |

**Text  Book :**

1. Saison 1 Méthode de Français – Marie-Noëlle Cocton, Anouchka De Oliveira, Dorothée Dupleix

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Group Project | Total |
|-------|--------|---------|------------|---------|---------------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | - | - | M | - | L | - | H | M | - | - | - | - | - |
| CO2 | - | - | H | - | - | L | L | - | - | - | - | - | - |
| CO3 | - | - | H | - | L | - | H | - | - | - | - | - | - |
| CO4 | - | - | H | - | - | L | M | M | - | - | - | - | - |
| CO5 | - | - | M | - | M | - | M | M | - | - | - | - | - |

H-High;  M-Medium;  L-Low

| Course designed by | Verified by | Checked by | Approved by |
|--------------------|-------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title |
|---|---|
| **21U2ENG101** | **Part II - English I** |
| **Semester : I** | **Credits : 4**     **CIA : 50 Marks**     **ESE : 50 Marks** |

**(Common to All UG Programmes)**

**Course Objective:**

To help students to imbibe, develop, practice and use the LSRW skills and fine tune their productive skills.

**Course Outcomes:**

| CO1 | Recognize listening, and reading proficiency through the prose discourses. |
|---|---|
| CO2 | Use and interpret imaginative, and creative skills through the poetic genre. |
| CO3 | Enhance the students to use English effectively through short story. |
| CO4 | Execute and exercise grammatical skills in academics and career. |
| CO5 | Evaluate the LSRW skills through literature. |

**Offered by : English department**

**Course Content**            **Instructional Hours / Week : 5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Prose**<br>**Leigh Hunt** – Getting Up On Cold Morning<br>**Rajagopalachari** – Tree Speaks<br>**Swami Vivekananda** – The Secret of Work | 1 | 1-3 |
| | | **Instructional Hours** | **15** |
| **II** | **Poetry**<br>**D.G Rossetti** – The Blessed Damozel<br>**Maya Angelou** -Phenomenal Women<br>**A. K. Ramanujan** – A River | 1 | 4-6 |
| | | **Instructional Hours** | **15** |
| **III** | **Short Stories**<br>**O. Henry** – The Last Leaf<br>**R. K. Narayan** – The Missing Mail<br>**Oscar Wilde** - The Happy Prince | 1 | 7-9 |
| | | **Instructional Hours** | **15** |
| **IV** | **Grammar and Vocabulary**<br>**Parts of Speech**<br>Tenses – Present, Past, Vocabulary of the specific domain, Punctuations, Kinds of Sentences. | 1 | 10-13 |
| | | **Instructional Hours** | **15** |

| | | | | |
|---|---|---|---|---|
| **V** | **Oral & Written Communication**<br>**Listening** : (UNIT I – IV)<br>**Listening** – Comprehension practice from Poetry, Prose, Short-stories, observing / viewing E-content (with subtitles), Guest / Invited Lectures, Conference / Seminar Presentations & Tests and DD National News Live, BBC, CNN, VOA etc<br>**Speaking** – In a Group Discussion Forum, speak about Tongue Twisters, Critical Thinking, and Seminar Presentations on Classroom-Assignments, and Peer-Team interactions.<br>**Reading** – Pronunciation practice and enhancement from Poetry, Prose, Short-stories, Magazines, News Paper etc<br>**Writing** – Asking & Giving Directions/Instructions, Developing Hints, and Filling Forms. | | 1 | 14-17 |
| | | | **Instructional Hours** | **15** |
| | | | **Total Hours** | **75** |

**Books for study:**

Unit I – V : Compiled by the PG & Research Department of English

**Books for Reference:**

1. CLIL ( Content & Language Integrated Learning ) – Module by TANSCHE NOTE: (Text: Prescribed chapters or pages will be given to the students by the department and the college)

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Speaking | Reading | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | M | - | H | H | M | M | H | H | L | - | L | L | M |
| **CO2** | H | - | H | H | M | H | H | H | L | - | L | L | M |
| **CO3** | H | - | H | M | H | H | H | H | L | - | L | L | M |
| **CO4** | H | L | H | M | H | H | H | H | L | - | L | L | M |
| **CO5** | H | L | H | H | H | H | H | H | L | - | L | L | M |

H-High;  M-Medium;  L-Low

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| **21U3CKC101** | **Core Paper I: Python Programming** |
| **Semester: I** | **Credits: 4** | **CIA:50 Marks** | **ESE: 50 Marks** |

**(Common to B. Sc. CS / AIML / DS / IT / DCFS / BCA)**

**Course Objective:**
To develop algorithmic solutions to simple computational problems using Python

**Course Outcome:**

| CO1 | Understand the basics of Python and write simple Python program. |
|---|---|
| CO2 | Develop Python programs using control statement and list method. |
| CO3 | Apply tuples, Functions, Set iterators to develop simple applications. |
| CO4 | Apply Python Strings, multithreading and exceptions for problem solving |
| CO5 | Manipulate Files and perform Event Handling. |

**Offered by: Information Technology**

**Course Content**                                         **Instructional Hours / Week:4**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Fundamentals** of Python Programming: Introduction – Features – Applications – Installation-Sample Program-Python Virtual Machine- Memory management in Python-Comparison between C, Java and Python- Keywords, Identifiers, Statements, Indentation. **Syntax and Styles:** Data Types – Literals – Variables-Operators and Expressions-Evaluation of Expression-Sample Programs. | 1 | 1,2 |
| | **Instructional Hours** | | **12** |
| **II** | **Control Flow:** If – While – For – Break – Continue-Pass-Entry Controlled Loop - Exit Controlled Loop – Counter Controlled Loop - Condition Controlled Loop - Nested Loop - Sample Programs. | 1 | 3,4,5 |
| | **Arrays**-Sequences - Python Lists: Read a List type from a Keyboard-Accessing Elements of a List- Modifying Elements of a List – Basic **Operations** – Built-in-Functions – Python List Methods. | 2 | 9 |
| | **Instructional Hours** | | **12** |
| **III** | **Tuples**-Need of a Tuple-Sequence of Unpacking – Methods – Sample programs. Dictionaries: Making a Dictionary-Basic Operations-Dictionary Operations – Sets-Iterators and Generators-Sample Programs. **Functions:** Defining Functions-Calling Functions-Passing Arguments-Keyword Arguments-Default Arguments-Required Arguments-Variable Length Arguments-Return Statements-Nesting of Passing Arguments-Anonymous Functions-Recursive Functions-Scope of Local and Global Variables. | 1 | 6,7,8 |
| | **Instructional Hours** | | **12** |
| **IV** | **Strings in Python:** Reading – Accessing – Modifying – Finding-Iterating through a String-Build-in String Functions. | 2 | 8 |
| | **Errors and Exceptions**-Multithreading | 1 | 14,15 |
| | **Instructional Hours** | | **12** |

| | | | |
|---|---|---|---|
| **V** | **Files and Directory Access:** Files and Streams-Opening a File-Reading/Writing Operations in a File-Other operations in a File-Iterating through a File-Splitting Words-Serialization and Deserialization.<br><br>**Events:** Event Objects-Binding callbacks to events-Event names-Keyboard events-Mouse Events-Sample Programs | 1 | 13,17 |
| | | **Instructional Hours** | **12** |
| | | **Total Hours** | **60** |

**Text Books**
1. Ch.Satyanaryana, M.Radhika Mani, B.N. Jagadesh, Python Programming, University Press Pvt. Ltd.2018.
2. Dr.S.A.Kulkarni, Problem Solving and Python Programming, 2nd Edition, Yesdee Publishing,2018

**Reference Books**
1. Allen B. Downey, **Think Python: How to Think Like a Computer Scientist**, 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers,2016
2. Guido van Rossum and Fred L. Drake Jr, **An Introduction to Python – Revised and updated for Python 3.2**, Network Theory Ltd.,2011.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Quiz | Assignment | Seminar | Total |
|---|---|---|---|---|---|---|
| **8** | **8** | **10** | **8** | **8** | **8** | **50** |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | L | M | H | L | M | H | H | H | H | M | M |
| **CO2** | H | H | L | M | H | L | M | H | H | H | H | M | M |
| **CO3** | H | H | L | M | H | L | M | H | H | H | H | H | H |
| **CO4** | H | H | L | M | H | L | M | H | H | H | H | H | H |
| **CO5** | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low.**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title | | |
|---|---|---|---|
| **21U3CKC102** | **Core Paper II: Digital Fundamentals and Computer Architecture** | | |
| **Semester: I** | **Credits: 4** | **CIA: 50 Marks** | **ESE :50 Marks** |

**(Common to B. Sc. CS / IT / BCA)**

**Course Objective:**

      To enable the students to know about the Operations in digital computer, Boolean algebra, CPU Architecture, memory design and its functionality

**Course Outcomes:**

| CO1 | Perform number conversion and identify the logic gates. |
|---|---|
| **CO2** | Design basic combinational logical circuit. |
| **CO3** | Understand the concept of I/O organization |
| **CO4** | Apply priority to interrupts and use it for data transfer. |
| **CO5** | Analyze memory organization and multiprocessor in digital computers. |

**Offered by: Computer Science**

**Course Content**                                     **Instructional Hours / Week: 4**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Digital Logic – Digital Operations - Digital Computers.** **Number System and Binary Codes:** Decimal, Binary, Octal, Hexadecimal Binary addition, Multiplication, Division – Floating point representation, Complements, BCD, Excess3, Gray Code. Arithmetic Circuits: Half adder, Full adder, Parallel binary adder, BCD adder, Serial Adder, Half subtractor, Full subtractor, Parallel binary subtractor- Digital Logic: the Basic Gates – NOR, NAND, XOR Gates. | 1,2 | 1,3,4 |
| | **Instructional Hours** | | **12** |
| **II** | **Combinational Logic Circuits:** Boolean algebra-Karnaugh map – Canonical form 1 – 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 | 1,2 | 2,5,6 |
| | **Instructional Hours** | | **12** |
| **III** | **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- Modes of Transfer | 3 | 11 |
| | **Instructional Hours** | | **12** |
| **IV** | **Priority Interrupt:** Daisy- Chaining Priority, Parallel Priority Interrupt. Direct Memory Access: DMA Controller, DMA Transfer. Input – Output Processor: CPU-IOP Communication-Serial Communication-Character Oriented Protocol, Data Transparency, Bit Oriented Protocol. | 3 | 11 |
| | **Instructional Hours** | | **12** |
| **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. **Multiprocessor: Interconnection** Structure, Interprocessor Arbitration, Interprocessor Communication and Synchronization. | 3 | 12 |
| | **Instructional Hours** | | **12** |
| | **Total Hours** | | **60** |

**Text Book(s):**
1. V.K. Puri&Henry **Digital Electronics Circuits and Systems**, TMH, 1997.
2. M. Morris Mano, **Computer System Architecture**, PHI publications, 2000.

**Unit I :** Sections: 1.1.3 to 1.1.8, 1.1.10 – 1.1.14, 1.4.2 to 1.4.5, 1.4.7 to 1.4.9,
1.2.2, 1.2.6 to 1.2.7, 1.2.9 (Text book 1:  Chapter 1)

**Unit II:** Sections: 1.2.1, 1.2.11 to 1.2.15, 1.2.17 to 18, 1.5.1 to 1.5.3, 1.5.6, 1.5.9
to1.5.10, 1.6.2 to1.6.9 (Text book 1: Chapter 1)

**Unit III:** Sections: 11.2 to 11.4 (Text book 2: Chapter 11)

**Unit IV:** Sections: 11.5 to 11.8 (Text book 2: Chapter 11)

**Unit V :** Sections: 12.1, 12.2, 12.4, 12.5, and 13.2 to 13.4(Text book 2: Chapter 12 and 13)

**Reference Book:**
1. M. Carter, Computer **Architecture**, Schaum'S Outline Series, TMH, 1996.

### Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Quiz | Assignment | Seminar | Total |
|-------|--------|---------|------|------------|---------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

### Mapping

| PO\CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO2 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO3 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO4 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO5 | H | H | M | M | M | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low.**

| Course Designed by | Verified by | Checked by | Approved by |
|--------------------|-------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| **21U3CAP101** | **Core Paper III: Practical in Python Programming** | | |
| **Semester: I** | **Credits: 4** | **CIA:50 Marks** | **ESE: 50 Marks** |

**Course Objective:** To introduce the concepts of python programming constructs.

**Course Outcomes:**

| CO1 | Develop simple Python programs. |
|---|---|
| **CO2** | Understand and apply the concept of control statements. |
| **CO3** | Apply the concept of looping constructs and functions for solving basic programs. |
| **CO4** | Develop programs for sorting of Strings, Lists, Tuples and File handler. |
| **CO5** | Create programs using Linear and Binary Search Techniques |

**Department offered:** Computer Science

**Course Content**                                                                    **Instructional Hours/Week: 4**

| |
|---|
| 1.  Write a python program that displays the following information: Your name, Full Address Mobile, number, College name, Course subjects. |
| 2.  Write a python program to find the largest three integers using if-else and conditional operator. |
| 3.  Write a python program that asks the user to enter a series of positive numbers (The user should enter a negative number to signal the end of the series) and the program should display the numbersin order and their sum. |
| 4.  Write a python program to find the product of two matrices. |
| 5.  Write recursive functions for GCD of two integers. |
| 6.  Write recursive functions for the factorial of positive integer. |
| 7.  Write recursive functions for Fibonacci Sequence up to given number n. |
| 8.  Write recursive functions to display prime number from 2 to n. |
| 9.  Write a python program that writes a series of random numbers to a file from1 to n and display. |
| 10. Write a python program to sort a given sequence: String, List and Tuple. |
| 11. Write a python program to make a simple calculator. |
| 12. Write a python program for Linear Search and Binary Search. |
| 13. Write python program in which a function (with single string parameter) is defined and calling that function prints the string parameters given to function. |
| 14. Write python program in which a class is define, then create object of that class and call simple print function define in class. |

| | | |
|---|---|---|
| | **Total Hours** | **60** |

**Tools for Assessment (50 Marks)**

| Application of Logic | Program Creativity | Program Debugging | Test 1 | Test 2 | Observation Note Book | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 8 | 10 | 10 | 6 | 50 |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title |
|---|---|
| 21U3MIA101 | **Allied Paper I : Mathematics for Computer Science** |
| Semester: I | Credits: 4 | CIA: 50 Marks | ESE: 50 Marks |

**(Common to B. Sc. CS / IT / DCFS / BCA)**

**Course Objective:**

To enable the students to learn concepts of Statistical and Numerical Methods used in Computer applications.

**Course Outcome:** The Students should be able to

| CO1 | Implement the concepts of Matrices in Computer Science |
|---|---|
| CO2 | Solve simultaneous Linear Algebraic Equations |
| CO3 | Relate various formulae in Numerical Differentiation and Integration |
| CO4 | Evaluate the Measures of Central tendency and dispersion. |
| CO5 | Analyse Correlation and Regression |

**Offered by:** Mathematics

**Course Content**                                    **Instructional Hours / Week: 5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Matrices:** Introduction – Types of Matrices –Matrix Operations - Determination – Inverse of a matrix – Rank of a Matrix. | 3 | 4 |
| | Eigen value Problems. | 1 | 4 |
| | **Instructional Hours** | | **15** |
| **II** | **System Of Simultaneous Linear Algebraic Equations:** Gauss elimination, Gauss Jordon, Gauss Jacobi Method, Gauss Seidal method. | 2 | 4 |
| | **Instructional Hours** | | **15** |
| **III** | **Numerical Differentiations:** Newton's forward Difference - Backward Difference – Stirling's formula. | 2 | 9 |
| | **Numerical Integration:** Trapezoidal Rule & Simpson's rule. | 2 | 9 |
| | **Instructional Hours** | | **15** |
| **IV** | **Measures of Central Tendency:** Mean Median and Mode – Empirical Relationship between mean, median and mode. | 3 | 7 |
| | **Measures of Dispersion:** Range, Quartile deviation and Standard deviation. | 3 | 8 |
| | **Instructional Hours** | | **15** |
| **V** | **Correlation:** Introduction, Scatter Diagram - Karl pearson's Correlation and Spearman's Rank Correlation. | 3 | 13 |
| | **Regression:** Regression equation of variables – Linear regression. | 3 | 13 |
| | **Instructional Hours** | | **15** |
| | **Total Hours** | | **75** |

**Text Books:**

1. P. Kandasamy, K.Thilgavathy, K. Gunavathy, **Engineering Mathematics**, **Volume I**, S.Chand Company, 2006.
2. P. Kandasamy, K.Thilagavathy and K. Gunavathy **Numerical Methods**, S.Chand & Company LTD, Revised 2005.

3. P.A. Navnitham, **Business Mathematics and Statistics**, **(Part II),** Jai Publishers, Trichy – 21.

    Unit I : Text Book 3, Chapter 4
        Text Book 1, Chapter1 (Eigen value problems only)
   Unit II : Text Book 2, Chapter 4, Section: 4.1- 4.3, 4.9
   Unit III : Text Book 2, Chapter 9, Sections: 9.1 - 9.4, 9.7, 9.9, 9.13, 9.14
   Unit IV : Text Book 3, Chapter 7, (only Mean, Median and Mode)
        Text Book 3, Chapter 8, (only Range,Q.D and S.D)
   Unit V : Text Book 3, Chapter 13.

**Reference Books:**

1. E. Balagurusamy, **Numerical Methods**, Tata McGraw Hill Publishing company LTD, Reprint, 2008.
2. S. C. Gupta, V. K. Kapoor, **Fundamental of Mathematical Statistics** Sultan Chand & Sons, Reprint 2014.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Seminar | Class Participation | Periodical Quizzes | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | M | M | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | M | M | M | H | H | H | H | M | M |
| CO3 | H | M | L | M | M | M | M | M | H | H | H | H | H |
| CO4 | H | M | L | M | M | H | M | H | H | H | H | H | H |
| CO5 | H | M | L | M | M | H | M | H | H | H | H | H | H |

H-High; M -Medium; L-Low.

| Course Designed by | Verified by HOD | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title | |
|---|---|---|
| **21U4ENV101** | **Ability Enhancement Compulsory Course - Environmental Studies** | |
| **Semester : I** | **Credits : 2** | **CIA : 50 Marks** |

**(Common to all UG Programmes)**

## Course Objective:

This course enables the students to recognize the interconnectedness of multiple factors in environmental challenges and communicate clearly and competently matters of environment concern.

## Course Outcomes:

On completion of course the students will be able to

| CO 1 | Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions. |
|---|---|
| CO 2 | Understand concepts and methods from ecological and physical sciences and their application in environmental problem solving. |
| CO 3 | Solve the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems. |
| CO 4 | Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world. |
| CO 5 | Apply systems concepts and methodologies to analyse and understand interactions between social and environmental processes. |

**Course Content**                                      **Instructional Hours / Week : 2**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | **Natural Resources:** Forest resources, Water resources, Mineral resources, Food resources, Energy resources and Land resources. | 1 | 2 |
| | **Instructional Hours** | | **6** |
| II | **Ecosystems:** Concept of an ecosystem, Structure and function; Introduction, types, characteristic features, structure and function of ecosystem - Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). **Activity: Prepare an album on types of Ecosystem.** | 1 | 3 |
| | **Instructional Hours** | | **6** |
| III | **Environmental Pollution:** Definition Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution and Noise pollution, Solid waste management. **Activity: Discuss the solutions for water pollution** | 1 | 5 |
| | **Instructional Hours** | | **6** |
| IV | **Social Issues and the Environment:** Water conservation, rain water harvesting, watershed management, Environmental ethics - Issue summits' and possible solutions and Public awareness. **Activity: Identify and analyse a Social Issue and an Environment issue in your locality.** | 1 | 6 |
| | **Instructional Hours** | | **6** |

| | | | |
|---|---|---|---|
| **V** | **Disaster Management:** Floods, Earthquakes, Cyclones, Landslides: From management to mitigation of disasters: The main elements of a mitigation and measures of strategy: Floods, Earthquakes, Cyclones and Landslides | 2 | 16 |
| | **Instructional Hours** | | **6** |
| **Field Work:** Visit to local area to document Environmental assets (River / Forest / Grass land / Mountain), Visit to local polluted site (Urban / Rural /industrial / Agricultural), Study of common plants, insects, birds, Study of simple ecosystem: Pond, River, Hill slopes. | | | |
| | **Total Hours** | | **30** |

**Text Book(s):**
1. Shashi Chawla. A Text Book of Environmental Studies, Tata McGraw-Hill, 2012.
2. From UGC website: https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf

**Reference Book(s):**
1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd., Bikaner.
2. Jadhav, H & Bhosale, V.M. 1995 Environmental Protection and Laws Himalaya Pub. House, Delhi 284 p.
3. Mckinney, M.L. & Schoch R.M. 1996. Environmental Science systems & Solutions
4. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p
5. Rao MN & Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt. Ltd., 345 p.

**Tools for Assessment (50 Marks)**

| Ecosystem Album Preparation | Field visit and report submission | Group discussions about issues related to their locality / about Disaster Management | CIA | Total |
|---|---|---|---|---|
| 10 | 10 | 5 | 25 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | L | - | L | H | H | H | H | L | - | - | - | - | L |
| **CO2** | L | - | L | H | H | H | H | L | - | - | - | - | L |
| **CO3** | L | - | L | H | H | H | H | L | - | - | - | - | L |
| **CO4** | L | - | L | H | H | H | H | L | - | - | - | - | L |
| **CO5** | L | - | L | H | H | H | H | L | - | - | - | - | L |

H-High; M-Medium; L-Low

| Course designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| 21U1TAM202 | PART – I   TAMIL – II |

| Semester : II | Credits : 4 | CIA : 50 Marks | ESE : 50 Marks |
|---|---|---|---|

**(Common to all UG Programmes)**

**Course Objective:** மொழி இலக்கியத்தின் வாயிலாக அறம்சார் பண்பு மற்றும் ஆளுமைமிக்க மாணவர்களை உருவாக்குதல்

**Course Outcomes:**

| CO1 | பக்தி இலக்கியங்கள் வழி வாழ்வியல் நெறிகளை மாணவர்களுக்கு எடுத்துரைத்தல் |
|---|---|
| CO2 | சிற்றிலக்கியங்களின் மூலம் தமிழர்களின் வாழ்க்கை கூறுகளை எடுத்துரைத்தல் |
| CO3 | தமிழ் நாவல்களின் வழி சமுதாயச் சிந்தனைகளைக் கூறுதல் |
| CO4 | இலக்கண அறிவை வளர்த்தல் |
| CO5 | தமிழ் இலக்கிய வரலாற்றுத் திறனை மேம்பாடு அடையச் செய்தல் |

**Offered by :** தமிழ்த்துறை

**Course Content**                              **Instructional Hours / Week : 5**

| Description |
|---|
| **Unit I**     பக்தி இலக்கியங்கள் |
|     1. திருமந்திரம் - மூன்றாம் தந்திரம் (அதிகாரம் 2) அ்ட்டமாசித்திகள் |
|     2. நாலாயிரத் திவ்யப்பிரபந்தம் - பெரியாழ்வார் - திருப்பல்லாண்டு |
|     3. மாணிக்கவாசகர் - எட்டாம் திருமுறை - அச்சோப்பதிகம் |
|     4. திருநாவுக்கரசர் - திருவரங்கமாலை – நான்காம் திருமுறை - தேவாரம் |
| **Instructional Hours :15** |
| **Unit II**     சிற்றிலக்கியங்கள் |
|     1. கலம்பகம் - நந்திக்கலம்பகம் (91 -100 பாடல்கள்) |
|     2. பள்ளு – முக்கூடற்பள்ளு (350 – 360) |
|     3. குறவஞ்சி – திருக்குற்றாலக்குறவஞ்சி (1-10) |
|     4. பிள்ளைத்தமிழ் - மீனாட்சியம்மை (1 -10) |
|     5. பட்டினத்தார் பாடல்கள் (358 – 367) |
| **Instructional Hours: 15** |
| **Unit III**     நாவல் |
|     1. செல்லாதபணம் - இமையம் (வெ.அண்ணாமலை) |
| **Instructional Hours :15** |
| **Unit IV**     இலக்கணம் |
|     1. வல்லினம் மிகும் இடங்கள் |
|     2. வல்லினம் மிகா இடங்கள் |
|     3. தொடை வகைகள் |
| **Instructional Hours :15** |
| **Unit V** இலக்கிய வரலாறு பாடத்திட்டத்தைத் தழுவியது |
|     1. சிற்றிலக்கியம் - அறிமுகம் |
|     2. புதினத்தின் தோற்றமும் வளர்ச்சியும் |
|     3. விண்ணப்பங்கள், மடல்கள், எழுதச் செய்தல். |
| ஐ�்ளௌவசரஉ_வழையெட ர்ழரசள : 15 |
| **Total Hours :75** |

பாடத்தொகுப்பு

இளங்கலை முதலாம் ஆண்டு தமிழ் மாணவர்களுக்குரிய பாடநூல் **"இளந்தளிர்"**
தொகுப்பு: தமிழ்த்துறை,நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.

பார்வை நூல்கள்:

1. திருமந்திரம் - மாணிக்கவாசகர் அருளிய திருவாசகம் - சித்தாந்த பண்டிதர் திரு.ப.இராமநாத பிள்ளை விளக்க உரையுடன் கழக வெளியீடு, திருநெல்வேலி, தென்னிந்திய சைவ சித்தாந்த நூற்பதிப்புக் கழகம் லிமிடெட், 522 டி.டி.கேசாலை, சென்னை - 600 018

2. புலவர்.திருவேங்கட இராமனுஜதாசன் - நாலாயிரதிவ்யப் பிரபந்தம் முதல் ஆயிரம் மூலமும் உரையும், உமாபதிப்பகம், 171,புதிய எண்.18 பவளக் காரத்தெரு, மண்ணடி, சென்னை - 001

3. தாயுமானவர் இயற்றிய பராபரக்கண்ணி -ஸ்ரீமத் சுவாமி சித்பவானந்தர் விரிவுரையுடன் ஸ்ரீ ராம கிருஷ்ண தபோவனம், திருப்பராய்த்துறை - 639115 திருச்சி மாவட்டம்

4. நந்திக்கலம்பகம் - மணிவாசகர் பதிப்பகம், ராஜவீதி, கோயமுத்தூர் - 641 001

5. முனைவர்.கதிர்முருகு-முக்கூடற்பள்ளு மூலமும் உரையும், சாரதா பதிப்பகம், சென்னை.

6. புலியூர்க்கேசிகன் தெளிவுரை-திருக்குற்றாலக்குறவஞ்சி, செல்லப்பா பதிப்பகம், சென்னை.

7. சாந்தலிங்கசுவாமிகள் - சாந்தலிங்க அடிகளார், திருமடம் வெளியீடு, பேரூர், கோவை - 10

8. அ.மாணிக்கம் உரையாசிரியர் - பட்டினத்தார் பாடல்கள் மூலமும் உரையும், வர்த்தமானன் பதிப்பகம், 40, சரோஜினி தெரு, தியாகராயநகர், சென்னை -17.

9. தமிழண்ணல் - புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை

10. நல்லதமிழ் எழுத வேண்டுமா? — அ.கி. பரந்தாமனார், அல்லி நிலையம், சென்னை - 007

11. முனைவர்.பாக்கியமேரி - தமிழ் இலக்கிய வரலாறு - என்.சி.பி.எச். வெளியீடு. கோவை - 600098

12. திருவருட்பா - அருள் விளக்கம், மணிவாசகர் பதிப்பகம், சென்னை.

13. மு.வ. தமிழ் இலக்கிய வரலாறு சாகித்ய அகாதெமி, புதுதில்லி - 110 001.

14. செல்லாதபணம் -இமையம் கிரியா பப்ளிகேசன்ஸ், சென்னை.

## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Seminar | Assignment | Group project | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | M | - | H | H | M | H | - | - | - | - | L |
| CO2 | - | - | H | - | M | M | L | H | - | - | - | - | L |
| CO3 | - | - | H | - | M | H | H | M | - | - | - | - | L |
| CO4 | - | - | H | - | H | M | L | H | - | - | - | - | L |
| CO5 | - | - | H | - | M | L | M | H | - | - | - | - | L |

**H-High; M-Medium; L-Low;**

| Course Designed by | Verified by HOD | Checked by | Approved by |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| 21U1HIN202 | PART – I : HINDI - II | | |
| Semester : II | Credits : 4 | CIA : 50 Marks | ESE : 50 Marks |

**(Common to all UG Programmes)**

कोर्स लक्ष्य : भारतीयता की साहित्य के माध्यम से पहचान कराना। कहानी के माध्यम से समकालीन समय के सच की पहचान कराना। हिंदी से अंग्रेज़ी में अनुवाद के माध्यम से भारतीय ज्ञान संपदा को अंतर्राष्ट्रीय स्तर तक पहुँचाने में छात्र को समर्थ बनाना। दैनन्दिन की बातचीत में हिंदी का निर्बाध प्रयोग करने में छात्र को सक्षम बनाना।

कोर्स परिणाम :

| CO1 | छात्रों में साहित्यिक अभिरुचि के साथ सामाजिक बोध बढ़ेगा। पत्राचार के क्षेत्र में वे स्वावलम्बी हो सकेंगे। |
|---|---|
| CO2 | भारतीय भाषा के ज्ञान को विदेश तक पहुँचाने के क्षेत्र में क्षमता हासिल करेंगे। |
| CO3 | राष्ट्रभाषा हिंदी से अंतर्राष्ट्रीय भाषा अंग्रेज़ी में सामग्री का अनुवाद करके छात्र हिंदी की ज्ञान संपदा बढ़ाने में कामयाब होंगे। |
| CO4 | रोज़मरा जीवन में हिंदी को बोल पाने में कामयाब होंगे। |
| CO5 | छात्र लघु कथाएँ लिखने में पारंगत होंगे। |

**Offered by : Hindi Department**

अध्ययन विषयवस्तु निर्देशात्मक घंटे / सप्ताह: 5

| इकाई | विवरण | |
|---|---|---|
| I | आधुनिक काव्य : रश्मिरथी, रामधारीसिंह दिनकर | |
| | निर्देशात्मक घंटे | 25 |
| II | कहानी — 1. पूस की रात (प्रेमचन्द), 2. आकाशदीप (जयशंकर प्रसाद) 3. अकेली (मन्नू भंडारी), 4. खेल (जैनेन्द्र कुमार) 4. सच बोलने की भूल (यशपाल) 5. चीफ की दावत (भीष्म साहनी) 6. आरोहण (संजीव) 7.( कफन प्रेमचंद ) | |
| | निर्देशात्मक घंटे | 20 |
| III | पत्र लेखन : (सरकारी पत्र, निजी पत्र, संपादक को पत्र, ज्ञापन, परिपत्र) | |
| | निर्देशात्मक घंटे | 10 |
| IV | अनुवाद : हिंदी से अंग्रेज़ी | |
| | निर्देशात्मक घंटे | 10 |
| V | बोलचाल हिंदी — 1. साक्षात्कार 2. अध्यापक–विद्यार्थी 3. ग्राहक–दूकानदार 4. डॉक्टर–मरीज 5. मुसाफिर–यात्री | |
| | निर्देशात्मक घंटे | 10 |
| | कुल घंटे | 75 |

**पाठ्यपुस्तक :**

1. रामधारीसिंह दिनकर, रश्मिरथी।
2. **कहानी**
3. **अनुवाद अभ्यास—3,** (दक्षिण भारत हिंदी प्रचार सभा)
4. आदर्श पत्र लेखन
5. व्याकरण

**संदर्भ ग्रंथ :**

1. प्रोफ. नीरज एम., **प्रामाणिक आलेखन और टिप्पणी**, राजपाल एंड सन्स, काश्मीर गेट, नई दिल्ली।

2. नीलम कपूर, **प्रयोजनमूलक हिंदी**, श्री नटराज प्रकाशन, साउथ गारडी, नई दिल्ली—2

3. डॉ. मधुधवन, **नवीन एकांकी संग्रह**, सुमित्रा प्रकाशन, अशोक नगर, अलहाबाद—1

### Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Project | Total |
|-------|--------|---------|------------|---------|---------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

### Mapping

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | - | - | M | - | L | H | M | - | - | - | - | - | L |
| CO2 | - | - | L | - | L | M | H | - | - | - | - | - | L |
| CO3 | - | - | H | - | M | H | M | - | - | - | - | - | L |
| CO4 | - | - | H | - | - | M | - | - | - | - | - | - | L |
| CO5 | - | - | M | - | L | - | L | - | - | - | - | - | L |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| **21U1MAL202** | **Part - I : Malayalam - II** | | |
| **Semester : II** | **Credits : 4** | **CIA : 50 Marks** | **ESE : 50 Marks** |

**Course Objective**: വിദ്യാർത്ഥികളിൽ മലയാള ഭാഷയുടെ വികാസവും മലയാള സാഹിത്യത്തിൽ നോവലുകൾക്കുള്ള സ്ഥാനവും വായനാശീലവും വർദ്ധിപ്പിക്കുന്നു.

**Course Outcomes**:

| CO1 | സമൂഹത്തിലെ ഒരു വിഭാഗത്തിന്റെ ജീവിതം |
|---|---|
| CO2 | പ്രകൃതിയും മറ്റു ജീവജാലങ്ങളുടെയും മാറ്റങ്ങൾ |
| CO3 | പ്രകൃതി നാശത്തിനെതിരായി ഒന്നിച്ചു പ്രവർത്തിക്കുന്നു |
| CO4 | സമൂഹത്തിലെ ഭാഷാസങ്കല്പം തിരിച്ചറിയുന്നു |
| CO5 | നല്ല ഭാഷ എങ്ങനെ സൃഷ്ടിക്കാമെന്ന് മനസ്സിലാക്കുന്നു |

**Offered by : Malayalam Department**

**Course Content**                                    **Instructional Hours/Week: 5**

| Unit | Description | |
|---|---|---|
| **I** | നോവൽ - എൻമകജെ | |
| | Instructional Hours | 15 |
| **II** | നോവൽ - എൻമകജെ | |
| | Instructional Hours | 15 |
| **III** | നോവൽ - എൻമകജെ | |
| | Instructional Hours | 15 |
| **IV** | ഭാഷാപരിചയം – തെളിമലയാളം | |
| | Instructional Hours | 15 |
| **V** | ഭാഷാപരിചയം – തെളിമലയാളം | |
| | Instructional Hours | 15 |
| | Total Hours | 75 |

**പാഠപുസ്തകങ്ങൾ :**

1. അംബികാസുതൻ മാങ്ങാട് - എൻമകജെ - ഡി.സി.ബുക്സ് കോട്ടയം
2. എം.എൻ.കാരശ്ശേരി – തെളിമലയാളം - ഡി.സി.ബുക്സ് കോട്ടയം

**സഹായകഗ്രന്ഥങ്ങൾ :**

1. പ്രൊഫ.എൻ.കൃഷ്ണപ്പിള്ള – കൈരളിയുടെ കഥ - ഡി.സി.ബുക്സ് കോട്ടയം

2. ഡോ. പന്മന രാമചന്ദ്രൻ നായർ - സമ്പൂർണ്ണമലയാള സാഹിത്യ ചരിത്രം - ഡി.സി.ബുക്സ് കോട്ടയം

3. ഡോ.കെ.എം. ജോർജ് - ആധുനിക മലയാള സാഹിത്യ ചരിത്രം പ്രസ്ഥാനങ്ങളിലൂടെ - ഡി.സി.ബുക്സ് കോട്ടയം

4. എരുമേലി - മലയാള സാഹിത്യം കാലഘട്ടത്തിലൂട - ഡി.സി.ബുക്സ് കോട്ടയം

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIAIII | Assignment | Seminar | Group Project | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO\CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | H | H | H | H | - | - | - | - | - | - | L |
| CO2 | - | - | H | M | H | M | - | - | - | - | - | - | L |
| CO3 | - | - | M | M | M | H | - | - | - | - | - | - | L |
| CO4 | - | - | L | H | L | H | - | - | - | - | - | - | L |
| CO5 | - | - | L | M | L | H | - | - | - | - | - | - | L |

**H-High; M-Medium; L-Low;**

| Course designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| **21U1FRN202** | **Part - I : French - II** |
| **Semester : II** | **Credits : 4**     **CIA : 50 Marks**     **ESE : 50 Marks** |

**(Common to all UG Programmes)**

**Course Objective**:

     This course comprises of French grammar that aims to apply the grammatical structures in the language.

**Course Outcomes**:

     Students will be able to

| CO1 | Acquire an understanding of French culture and use basic verbs. |
|---|---|
| CO2 | Describe about a place, learn pronom en, y and adjectives. |
| CO3 | Recall the tenses and learn Imparfait tense |
| CO4 | Narrate about the weather and learn pronom COD and COI |
| CO5 | Draft short passages, translate and comprehend . |

**Offered by : French Department**

**Course Content**               **Instructional Hours/Week : 5**

| Unit | Description | |
|---|---|---|
| I | Gouter a la campagne | |
| | Instructional Hours | 15 |
| II | Voyager dans sa ville | |
| | Instructional Hours | 15 |
| III | Faire du neuf avec du vieux | |
| | Instructional Hours | 15 |
| IV | Changer d'air | |
| | Instructional Hours | 15 |
| V | Devenir eco-citoyen | |
| | Instructional Hours | 15 |
| | Total Hours | 75 |

**Text Book:**

1. Saison 1 Méthode de Français – Marie-Noëlle Cocton, Anouchka De Oliveira, Dorothée Dupleix

## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Group Project | Total |
|-------|--------|---------|------------|---------|---------------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | - | - | H | - | - | M | H | - | - | - | - | - | - |
| CO2 | - | - | H | - | L | - | M | L | - | - | - | - | - |
| CO3 | - | - | H | - | - | - | M | M | - | - | - | - | - |
| CO4 | - | - | H | - | L | M | H | L | - | - | - | - | - |
| CO5 | - | - | H | - | - | M | H | - | - | - | - | - | - |

H-High; M-Medium; L-Low

| Course designed by | Verified by | Checked by | Approved by |
|--------------------|-------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| **21U2ENG202** | **Part II - English II** | | |
| **Semester : II** | **Credits : 4** | **CIA : 50 Marks** | **ESE : 50 Marks** |

**(Common to All UG Programmes)**

**Course Objective:**

To equip the students with the language skills and its functional usage. Facilitate the insight and taste of Literature.

**Course Outcomes:**

| CO1 | Mastering life skills through prose discourse. |
|---|---|
| CO2 | Acquire ethics and values through poetic genre. |
| CO3 | Recognise the nuances of English language through short stories. |
| CO4 | Enhance fluency over language with self-confidence. |
| CO5 | Examine how the language is used in literature and develop LSRW Skills |

**Offered by : English department**

**Course Content**                                    **Instructional Hours / Week : 5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Prose**<br>Sachin Tendulkar - Learning the Game<br>Mahatma Gandhi - Women Not the Weaker Sex<br>Issac Asimov - The Fun They had | 2 | |
| | **Instructional Hours** | | **15** |
| **II** | **Poetry**<br>Robert Frost - Stopping by Woods on a Snowy Evening<br>William Blake - A Poison Tree<br>Oliver Goldsmith - The Village School Master | 2 | |
| | **Instructional Hours** | | **15** |
| **III** | **Short Stories**<br>Mark Twain - The Cat and the Painkiller<br>Japanese Folk Tale - The Envious Neighbour<br>Khushwant Singh – Karma | 1 | |
| | **Instructional Hours** | | **15** |
| **IV** | **Grammar**<br>Active and Passive Voices<br>Direct and Indirect Speech<br>Sentence Connectors and Linkers | 1 | |
| | **Instructional Hours** | | **15** |
| **V** | **Oral & Written Communication (Unit I –IV)**<br>**Listening** – Comprehension practice from Poetry, Prose, Online Voice Practice, observing/viewing E-content (with subtitles), | 2 | |

| | |
|---|---|
| Guest/Invited Lectures, Conference/Seminar Presentations & Tests, and DD National News Live, BBC, CNN, VOA etc<br>**Speaking** – In Group Discussion Forum, participate in the Turn Taking, and Conversation Management, Debating, Defending/Mock Viva-Voice, Seminar Presentations on Classroom-Assignments, and Peer-Team-interactions.<br>**Reading** – Different Reading Strategies in Poetry, Prose, Novel, Newspaper etc<br>**Writing**– Dialogue/Conversation Writing, Advertisement Writing, and Creative Writing (autobiography, article etc,) for publication in Mass Media. | |
| **Instructional Hours** | **15** |
| **Total Hours** | **75** |

**Books for study:**

    **Unit I – V : Compiled by the PG & Research Department of English**

**Books for Reference:**

    1.  CLIL ( Content & Language Integrated Learning ) – Module by TANSCHE

    NOTE: (Text: Prescribed chapters or pages will be given to the students by the department and the college)

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|-------|--------|---------|------------|---------|------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | M | M | H | H | M | M | H | H | L | - | L | L | M |
| CO2 | H | M | H | H | M | H | H | H | L | - | L | L | M |
| CO3 | H | M | H | M | H | H | H | H | L | - | L | L | M |
| CO4 | H | H | H | M | H | H | H | H | L | - | L | L | M |
| CO5 | H | M | H | H | H | H | H | H | L | - | L | L | M |

H-High;  M-Medium;  L-Low

| Course Designed by | Verified by HoD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| **21U3CKC203** | **Core Paper IV:  Java Programming** |
| **Semester: II** | **Credits: 4** | **CIA : 50  Marks** | **ESE: 50 Marks** |

**(Common to B. Sc. CS / IT / BCA)**

**Course Objective:**

To gain knowledge about basic Java language syntax and semantics to write java programs and understand the principles of classes, methods, inheritance, polymorphism and packages.

**Course Outcomes (CO):**

| CO1 | Remember the fundamental concepts of Object-oriented Programming. |
|---|---|
| CO2 | Develop simple Java programs with Control statements and arrays. |
| CO3 | Apply the principles of packages and interfaces. |
| CO4 | Design Java application using the concepts of Exception Handling and Multithreading. |
| CO5 | Develop applications using IO Streams and AWT. |

**Offered by: Computer Science**

**Course Content**                                            **Instructional Hours / Week: 4**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Fundamentals of Object-Oriented Programming:** Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – Application of Object-Oriented Programming. **Java Evolution:** History – Features – How Java differs from C and C++ – Java and Internet – Java and www –Web Browsers. **Overview of Java:** simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine-Command Line Arguments. | 1 | 1,2,3 |
| | **Instructional Hours** | | **12** |
| **II** | 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 - Labelled Loops, Classes, Objects and Methods. **Arrays:** One Dimensional Array-Creating an Array- Two Dimensional Array. | 1 | 4,5,6,7 & 8 |
| | **Instructional Hours** | | **12** |
| **III** | **Interfaces:** Multiple Interface-Introduction-Defining Interface-Extending Interface-Implementing Interface-Accessing Interface Variables. **Packages:** Introduction-Java API Packages-Using System Packages-Naming Conventions-Creating Packages-Accessing a Package-Using a Package-Adding a Class to a Package-Hiding Classes-Static Import. | 1 | 10,11 & 12 |
| | **Instructional Hours** | | **12** |
| **IV** | **Exception Handling:** Fundamentals-Hierarchy of the Exception Classes-Types of Exception –Exception Class-Uncaught Exceptions-Handling Exception-User Defined Exception. | | 10 & 11 |
| | **Multithreaded Programming:** The Java Thread Model-Concept of Thread-Runnable Interface-Thread Class-Thread Creation-Thread's Life Cycle-Thread Scheduling-Synchronization and Deadlock-Inter Thread Communication-Joining Threads-Suspending, Resuming and Stopping Threads-JDBC. | 2 | |
| | **Instructional Hours** | | **12** |

| | | | |
|---|---|---|---|
| **V** | **Input/Output Classes:** Input and Output Operations-Hierarchy of Classes in java.io Package-File Class-InputStream and OutputStream Classes-FileInputStream and FileOutputStream Classes-Reader and Writer Classes-RandomAccessFile Class-Stream Tokenizer. **Applets:** Applet Basics-Applet Life Cycle-Running Applets-Methods of the Applet Class-Graphics Class-Color Class-Font Class-Limitations of Applets. **Abstract Window Toolkit:** AWT-AWT Classes-Hierarchy of Classes in Java.awt Package-Control Fundamentals-Component Class-Basic Component Classes-Container Class.-Various Container Class. | 2 | 16,18& 19 |
| | | **Instructional Hours** | **12** |
| | | **Total Hours** | **60** |

**Text Book(s):**
1. E. Balagurusamy, **Programming with Java – A Primer**, Tata McGraw Hill Publication, 3rd Edition, 2007
2. ISRD Group, **Introduction To Object Oriented Programming Through Java**, Tata McGraw Hill Publication, Forth Reprint 2008.

**Reference Book(s):**
1. Patrick Naughton& Hebert Schildt, **The Complete Reference Java 2,** Tata McGraw Hill Publication**,** 3rd Edition , 2002
2. John R. Hubbard, **Programming with Java**, Tata McGraw Hill Publication,  2nd Edition, 2009

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Class Participation | Assignment | Seminar | Total |
|---|---|---|---|---|---|---|
| **8** | **8** | **10** | **8** | **8** | **8** | **50** |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | L | M | H | L | M | H | H | H | H | M | M |
| **CO2** | H | H | L | M | H | L | M | H | H | H | H | M | M |
| **CO3** | H | H | L | M | H | L | M | H | H | H | H | H | H |
| **CO4** | H | H | L | M | H | L | M | H | H | H | H | H | H |
| **CO5** | H | H | L | M | H | L | M | H | H | H | H | H | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title | | |
|---|---|---|---|
| **21U3CKC204** | **Core Paper V: Data Structures** | | |
| **Semester: II** | **Credits: 4** | **CIA: 50 Marks** | **ESE:50 Marks** |

**(Common to B. Sc. CS / IT / BCA)**

**Course Objective:**

   To enable the students to understand about the various techniques such as Linked list, Searching and Sorting, apply them to solve complex programs.

**Course Outcomes:**

| | |
|---|---|
| **CO1** | Understand the representation of Arrays, Stacks and Queues. |
| **CO2** | Solve the problems using Queues and List. |
| **CO3** | Demonstrate different types of Tree representation and Graph. |
| **CO4** | Design Algorithm to perform different types of Sorting. |
| **CO5** | Illustrate Symbol, hash and File organization, apply to solve real world problem using appropriate Data Structure. |

**Offered by: Computer Science**

**Course Content**                                    **Instructional Hours/Week: 4**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Introduction:** Overview - Create Programs - Analyze Programs. | 1 | 1,2,3 |
| | **Arrays:** Axiomatization - Sparse Matrices - Representation of Arrays. | | |
| | **Stacks & Queues:** Fundamentals - Evaluation of Expressions - Multiple Stacks and Queues. | | |
| | **Instructional Hours** | | **12** |
| **II** | **Recursion:** Recursive definition and process - recursion in C - Writing Recursive program - simulating Recursion - efficiency of recursion. **Queues and List:** The queue and its sequential representation - Linked list - List in C - An example Simulation using linked list - other list structure. | 2 | 3,4 |
| | **Instructional Hours** | | **12** |
| **III** | **Trees:** Binary Tree - Binary Tree representation - the Huffman algorithm - representing list as Binary - Trees and their applications - Game trees. **Graphs:** A Flow problem - The linked representation of Graph - Graph traversal and spanning forests | 2 | 5,8 |
| | **Instructional Hours** | | **12** |
| **IV** | **Internal Sorting:** Insertion Sort - Quick Sort - 2-Way Merge Sort - Heap Sort - Shell Sort. **External Sorting:** Storage Devices - K-Way Merging- **Sorting With Tapes:** Balanced Merge Sorts - Polyphase Merge. | 1 | 7,8 |
| | **Instructional Hours** | | **12** |
| **V** | **Symbol Table:** Static Tree Tables - Dynamic Tree Tables - **Hash Tables:** Hashing Functions- Overflow Handling. **Files:** Files, Queries and Sequential Organizations- Index Techniques - **File Organization:** Sequential Organization- Random Organization- Linked Organization. | 1 | 9, 10 |
| | **Instructional Hours** | | **12** |
| | **Total Hours** | | **60** |

**Text Book(s):**
1. Ellis Horowitz &SartajSahni, **Fundamentals of Data Structures**, Galgotia Publication.
2. Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J.Augenstein, **Data Structure using C**, Pearson Education, 2009.

**Unit I:**Sections: 1.1 to 1.4, 2.1 to 2.4and 3.1 to 3.4 (Text Book 1: Chapter 1, 2 and 3)
**Unit II:**Sections: 3.1 to 3.4, 4.1 to 4.5 (Text Book 2: Chapter 3 and 4)
**Unit III:** Sections: 5.1 to 5.6 (Text Book 2: Chapter 5)
**Unit IV:** Section: 7.1 to 7.8, 8.1 to 8.3 (Text Book 1: Chapter 7 and 8)
**Unit V:** Section: 9.1 to 9.3, 10.1, 10.3 (Text Book 1: Chapter 9 and 10)

**Reference Book(s):**
1. Ellis Horowitz, Sartaj Sahni & Sanguthevar Rajasekaran, **Fundamentals of Computer Algorithms**, Galgotia Publications Pvt Ltd, 1999.
2. Jean-Paul Tremblay and Paul G. Sorenson, **An Introduction to Data Structures with Applications**, Second Edition, Tata MaGraw Hill,2008
3. Mark Allen Weiss, **Data Structures and Algorithm Analysis in C**, Florida International University, Pearson Education, Second Edition, 1997.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Class Participation | Assignment | Seminar | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO2 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO3 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO4 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO5 | H | H | M | M | M | L | M | H | H | H | H | H | H |

**H: High, M: Medium, L: Low**

| Course Designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| **21U3CAP202** | **Core Paper VI: Practical in Java Programming** | | |
| **Semester: II** | **Credits: 4** | **CIA : 50 Marks** | **ESE: 50 Marks** |

**Course Objective:**
To enable the students to develop problem solving skills and programming ability in Java Language

**Course Outcomes (CO):**

| CO1 | Develop programs to implement the string, array and multiple inheritance concepts. |
|---|---|
| CO2 | Implement the multithreading, exception handling concepts to solve real world Problems |
| CO3 | Apply the concept of package to illustrate reusability. |
| CO4 | Develop the programs for the concepts of Applets and AWT. |
| CO5 | Create application for file handling. |

**Offered by: Computer Science**

**Course Content**            **Instructional Hours / Week: 4**

| S. No. | List of Practical |
|---|---|
| 1 | Write a Java Applications to extract a portion of a character string and print the extracted String. |
| 2 | Write a Java Program to implement the concept of multiple inheritance using Interfaces. |
| 3 | Write a Java Program to create an Exception called payout-of-bounds and throw the Exception. |
| 4 | Write a Java Program to implement the concept of multithreading with the use of any three multiplication tables and assign three different priorities to them. |
| 5 | Write a Java Program to draw several shapes in the created windows. |
| 6 | Write a Java Program to create a frame with four text fields name, street, city and pin code with suitable tables. Also add a button called my details. When the button is clicked its corresponding values are to be appeared in the text fields. |
| 7. | Write a Java Program to demonstrate the Multiple Selection List-box. |
| 8 | Write a Java program to import classes from user defined package and creating package. |
| 9 | Write a Java Program to create Menu Bars and pull-down menus. |
| 10. | Write a Java 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. |
| 11 | Write a Java Program to draw circle, square, ellipse and rectangle at the mouse click positions. |
| 12 | Write a Java Program which open an existing file and append text to that file. |
| | **Total Hours : 60** |

**Tools for Assessment (50 Marks)**

| Application of Logic | Program Creativity | Program Debugging | Test 1 | Test 2 | Observation Note Book | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 8 | 10 | 10 | 6 | 50 |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
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| Course Code | Title | | |
|---|---|---|---|
| **21U3MIA202** | **Allied Paper II : Discrete Mathematics** | | |
| **Semester: II** | **Credits : 4** | **CIA: 50 Marks** | **ESE: 50 Marks** |

**(Common to B. Sc. CS / AIML / DS / IT / DCFS / BCA)**

**Course Objective:**

To learn about the discrete structure for computer based application.

**Course Outcome:** The Students should be able to

| CO1 | Learn the basic concepts of Set theory |
|---|---|
| CO2 | Implement the basic ideas of Mathematical Logic in Computer Science |
| CO3 | Classify different types of Relations and Functions |
| CO4 | Understand the concepts of Grammar and Automata theory. |
| CO5 | Know the concepts of Graph theory |

**Offered by:** Mathematics

**Course Content**                                    **Instructional Hours/Week: 05**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Set Theory:** Introduction-Set & its Elements-Set Description-Types of sets-Venn-Euler Diagrams-Set operations & Laws of set theory. | 1 | 1 |
| | Fundamental products- Partitions of sets – Min sets- Algebra of sets and Duality-Inclusion and Exclusion principle. | 1 | 1 |
| | **Instructional Hours** | | **15** |
| **II** | **Mathematical Logic:** Introduction- prepositional calculus –Basic logical operations- Tautologies-Contradiction – Argument-Method of proof- Predicate calculus. | 1 | 12 |
| | **Instructional Hours** | | **15** |
| **III** | **Relations:** Binary Relations – Set operation on relations-Types of Relations – Partial order relation – Equivalence relation – Composition of relations. | 1 | 3 |
| | Functions – Types of functions – Invertible functions – Composition of functions. | 1 | 4 |
| | **Instructional Hours** | | **15** |
| **IV** | **Languages:** Operations on languages – Regular Expressions and regular languages. | 1 | 15 |
| | **Grammar:** Types of grammars – Grammar Construction-Finite state machine – Finite -State automata. | 1 | 15 |
| | **Instructional Hours** | | **15** |
| **V** | **Graph Theory:** Basic terminology – paths, cycle & Connectivity – Sub graphs – Types of graphs. | 1 | 9 |
| | Trees – Properties of trees – Binary trees. | 1 | 10 |
| | **Instructional Hours** | | **15** |
| | **Total Hours** | | **75** |

**Text Books:**

1. J.K. Sharma, **Discrete Mathematics**, Macmillan India Ltd, 2nd edition, 2005.
   Unit I   : Chapter 1, Section: 1.1-1.7, 1.9,1 .10, 1.12, 1.14
   Unit II  : Chapter 12, Section: 12.1 – 12.3 & 12.8, 12.9, 12.11, 12.12 & 12.14
   Unit III : Chapter 3, Section: 3.3 - 3.7, 3.11
                Chapter 4, Section: 4.1 – 4.5
   Unit IV : Chapter 15, Section: 15.1-15.7
   Unit V  : Chapter 9, Section: 9.1 – 9.5
                Chapter 10, Section: 10.1-10.3

**Reference Books:**

1. J. P. Tremblay, R. Manohar, **Discrete Mathematics Structures with Applications to Computer Science**, McGraw Hill International Edition, 2005.

2. T.Veerarajan, **Discrete Mathematics with Graph Theory and Combinatorics** , McGraw Hill International Edition, 2008

**Tools for Assessment (50 Marks)**

| CIA  I | CIA II | Model | Seminar | Class Participation | Periodical Quizzes | Total |
|--------|--------|-------|---------|---------------------|--------------------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO\CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | L | M | H | M | M | M | H | H | H | M | M |
| CO2 | H | H | L | M | H | M | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | M | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | M | M | M | M | H | H | H | H | H |
| CO5 | H | H | L | H | M | M | M | H | H | H | H | H | H |

H-High;  M – Medium; L-Low.

| Course Designed by | Verified by HOD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
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| Course Code | Title |
|---|---|
| **21U4HRC202** | Ability Enhancement Compulsory Course - **Human Rights and Constitution of India** |
| **Semester : II** | **Credits : 2** | **CIA : 50 Marks** |

(Common to all UG Programmes)

**Course Objective:**

Understand the concept of human rights and the importance of Indian Constitution.

**Course Outcomes:**

| CO1 | Understand the principal aspects of human rights and duties in a broad sweep. |
|---|---|
| CO2 | Acquire the knowledge about the Fundamental Duties and Rights of Indian Citizen |
| CO3 | To know the rights of women and Children in India |
| CO4 | Understand the structure and importance of Indian Constitution |
| CO5 | Know the functions of Government and Election Commission of India |

**Course Content**                    **Instructional Hours / Week : 2**

| Unit | Description | |
|---|---|---|
| **I** | An Introduction to Human Rights :Values – Dignity, Liberty, Equality, Justice, Unity in Diversity - Human Rights – Meaning and features; Significance of the study - Classification of Human Rights - Rights and Duties – Correlation | |
| | **Instructional Hours** | **6** |
| **II** | Human Rights and Fundamental Rights - Fundamental Rights and Fundamental Duties- Directive Principles - Role of Judiciary in the protection of Human Rights- National Human Rights Commission<br>*Activity : Case Study related to Human Rights* | |
| | **Instructional Hours** | **6** |
| **III** | Human Rights of Women and Children- Social Practice and Constitutional Safeguards – Female foeticide and infanticide-Physical assault and Harassment- Domestic violence-Conditions of Working Women<br>*Activity : Conduct a Group Discussion on the above topics* | |
| | **Instructional Hours** | **6** |
| **IV** | **Constitution – Structure and Principles -** Meaning and importance of Constitution - Making of Indian Constitution –Sources - Salient features of Indian Constitution-Government of Union- Government of State-Features of judicial system in India | |
| | **Instructional Hours** | **6** |
| **V** | Federalism in India – Features - Local Government -Panchayat –Powers and functions -Election Commission –Organisation and functions-Citizen oriented measures – RTI – Provisions and significance<br>*Activity : Seminar/ Role play related to Indian Constitution* | |
| | **Instructional Hours** | **6** |
| | **Total Hours** | **30** |

**Text Book:**

    1. **"Human Rights and Constitution of India",** Complied by Curriculum Development Cell, Nehru Artsand Science College.

**Tools for Assessment (50 Marks)**

| Case Study and Report Submission | Seminar / Role play | Group Discussion | Comprehensive test for 5×5 = 25 marks | Total |
|---|---|---|---|---|
| 10 | 10 | 5 | 25 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | L | H | H | H | H | - | - | - | - | L |
| CO2 | - | - | - | L | H | H | H | H | - | - | - | - | L |
| CO3 | - | - | - | L | H | H | H | H | - | - | - | - | L |
| CO4 | - | - | - | L | H | H | H | H | - | - | - | - | L |
| CO5 | - | - | - | L | H | H | H | H | - | - | - | - | L |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
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| Course Code | Title |
|---|---|
| **21U4HVY201** | **Value Education: Human Values and Yoga Practice I** |
| **Semesters: I & II** | **Credits: 2** | **CIA: 50 Marks** |

**(Common to all UG Programme)**

**Course Objective:**

- To help the students appreciate the essential complementarily between 'values' and 'skills' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings.
- To prepare and distribute standardized Yoga teaching and training material with reference to institute health**.**

**Course Outcomes:**

| CO1 | To know the importance of ethics to be followed in the Human life. |
|---|---|
| **CO2** | To inculcate a sense of respect towards harnessing values of life and spiritof fulfilling social responsibilities. |
| **CO3** | To gain knowledge about the values that develop life skills. |
| **CO4** | To understand and Practice Meditation & Surya Namaskar. |
| **CO5** | To understand and apply the knowledge for physical health and well-being through Simple exercises. |

**Course Content                                 Instructional Hours / Week : 1 (For Semesters I and II)**

| Unit | Description |
|---|---|
| **I** | **Human Values –** Introduction **-** Definition of Ethics and Values - Character and Conduct - Nature and Scope of Ethics. |
| | **Instructional Hours              6** |
| **II** | **Individual and Society -** Theories of Society - Social Relationships and Society - Empathy: Compassion towards other being - Environmental Ethics and Nature. |
| | **Instructional Hours              6** |
| **III** | Cultural Education - Purity India - Patriotism - Time management. Greatness of Womanhood - Food is medicine- Individual peace -World Peace. |
| | **Instructional Hours              6** |
| **IV** | **Power of Meditation**- Development of mind in stages - Mental Frequencies Methods for Concentration. Meditation Practices - Surya Namaskar. |
| | **Instructional Hours              6** |
| **V** | **Simplified Physical Exercise**s – Kayakalpa Practices - Training for Potentialising the Mind. |
| | **Instructional Hours              6** |
| | **Total Hours**            **30** |

**Text book:**

1. **"Value Education I ",** compiled by Curriculum Development cell, Nehru Arts and Science College.

**Tools for Assessment**

| 25 marks | 25 marks |
|---|---|
| Comprehensive test in Units I to III for 25 marks during CIA III of Sem. II | Perform 02 Yoga postures for Practical exam to be conducted during the mid. of Sem. II |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | H | L | M | H | H | - | - | - | - | L |
| CO2 | - | - | - | L | M | H | M | H | - | - | - | - | L |
| CO3 | - | - | - | L | M | H | H | H | - | - | - | - | L |
| CO4 | - | - | - | L | L | H | M | H | - | - | - | - | L |
| CO5 | - | - | - | L | L | H | M | H | - | - | - | - | L |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HOD | Checked by | Approved by |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| **21U3CKC305** | **Core Paper VII:  Operating Systems** | | |
| **Semester: III** | **Credits: 4** | **CIA:50 Marks** | **ESE: 50 Marks** |

**(Common to B. Sc. CS / CT / IT / BCA)**

**Course Objective:**

To understand the importance of Operating Systems, its functionalities to manage resources of Computer and Peripherals.

**Course Outcomes:**

| CO1 | Recognize the basic concepts of Operating system |
|---|---|
| **CO2** | Understand the concepts of processes and scheduling of process. |
| **CO3** | Explain the techniques of managing the deadlock and memory |
| **CO4** | Illustrate the Segmentation of Paging and Page Replacement policies. |
| **CO5** | Apply various file system implementation |

 **Offered by: Computer Applications**

**Course Content**                          **Instructional Hours / Week: 5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | Introduction: Abstract views of an OS – Goals of an OS – OS and the Computer System – Classes of Operating System: Batch Processing systems – Multiprogramming systems – Time sharing systems – Real Time Operating System – Distributed Operating System – Modern Operating systems | 1 | 1,2 |
| | **Instructional Hours** | | **15** |
| **II** | Processes and Programs – Programmer View of Process – OS view of Process – Controlling Processes – Process State Transitions – Process Control Block – Process Scheduling: Scheduling Concepts and Terminology – Fundamental Techniques of scheduling – Non Preemptive scheduling policies - Preemptive scheduling policies. | 1 | 3,4 |
| | **Instructional Hours** | | **15** |
| **III** | Deadlock: Definition – Deadlocks in Resource Allocation – Handling deadlocks – Deadlock Detection and Resolution - Deadlock Prevention – Deadlock Avoidance. Memory Management: Static and dynamic Memory Allocation – The Memory Allocation Model – reuse of Memory – Contiguous Memory allocation – Non Contiguous Memory Allocation. | 1 | 11 |
| | **Instructional Hours** | | **15** |
| **IV** | Paging – Segmentation – Segmentation with Paging. Virtual Memory: Basics – Demand Paging – Overview of Paging – Demand Paging preliminaries – Page replacement policies – Virtual Memory using segmentation | 1 | 5 |
| | **Instructional Hours** | | **15** |

| V | Layers of the Input Output Control System (IOCS) – Overview of I/O Organization – Disk Scheduling. File systems: File System and IOCS – Files and File Operations – Fundamental File organizations – directory Structures – Case study on LINUX OS ,UNIX OS, Android OS (Self Study) | 1 | 7 |
|---|---|---|---|
| | | **Instructional Hours** | **15** |
| | | **Total Hours** | **75** |

**Text Book:**
1. D M Dhamdhere, **"Operating Systems-A concept – Based  Approach"**, 2nd Edition,2006.

**Reference Books"**
1. William Stallimgs , **"Operating Systems Internals and Design  Principles"**, Seventh Edition,Pearson Education Inc.2012.
2. Abraham Silberchatz, Peter Baer Galvin,Greg Gagne, **"Operating System Concepts"**, Seventh Edition, Pearson 2009.

## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Case Study Analysis | Assignment | Seminar | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | M | M | M | L | M | H | H | H | H | M | M |
| **CO2** | H | H | M | M | M | L | M | H | H | H | H | M | M |
| **CO3** | H | H | M | M | M | L | M | H | H | H | H | H | H |
| **CO4** | H | H | M | M | M | L | M | H | H | H | H | H | H |
| **CO5** | H | H | M | M | M | L | M | H | H | H | H | H | H |

H-High; M-Medium; L-Low

| Course Designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| **21U3CAC303** | **Core Paper VIII:  RDBMS and ORACLE** |
| **Semester: III** | **Credits: 4** | **CIA : 50  Marks** | **ESE: 50    Marks** |

**Course Objective:**

To inculcate fundamental knowledge in RDBMS concepts and make them to create, manipulate information with the real time datasets.

**Course Outcomes:**

| CO1 | Remember the Data types and fundamentals of database. |
|---|---|
| **CO2** | Understanding the concept of Database and Various queries in SQL , PL/SQL |
| **CO3** | Applying the concept in various tables to retrieve information. |
| **CO4** | Analysing the different types of queries in SQL. |
| **CO5** | Able to evaluate the errors in SQL & PL/SQL statements. |

**Offered by: Computer Applications**

**Course Content**                                                      **Instructional Hours / Week: 5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Introduction:** Database **-** Purpose of Database Systems - Data Models – Database Language – Transaction Management - Overall System Structure. <br><br> A Relational approach: Relationships –Relational Database Model – Integrity Rules – Theoretical Relational Languages. **Database Design:** Data Modelling and Normalization: Data Modeling – Dependency –Normal forms – Dependency Diagrams – De –normalization. | 2,1 | 1 |
| | **Instructional Hours** | | **15** |
| **II** | **Oracle9i:**Oracle9i an introduction – SQL –SQL *Plus Commands – Errors & Help – Alternate Text Editors. Oracle Tables.**DDL:** Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes. | 1 | 3,4 |
| | **Instructional Hours** | | **15** |
| **III** | **Working with Table:** Data Management and Retrieval: DML – Adding a new Row/Record – Updating and Deleting an Existing Rows/Records – Retrieving Data from Table -Restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure. Functions and Grouping: Built-in functions – Grouping Data. **Multiple Tables:** Joins and Set operations: Join –     Set operations | 1 | 5,6 |
| | **Instructional Hours** | | **15** |

| IV | **PL/SQL:** A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic 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 & Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions. | 1 | 10, 11&12 |
|---|---|---|---|
| | **Instructional Hours** | | **15** |
| V | **PL/SQL Composite Data Types:** Records – Tables. Named Blocks: Procedures – Functions – Packages –Triggers –Data Dictionary Views | 1 | 13,14 |
| | **Instructional Hours** | | **15** |
| | **Total Hours** | | **75** |

**Text Book(s):**

1. Nilesh Shah , **"Database Systems Using Oracle"**, 2nd edition, PHI.
2. Abraham Silberschatz, Henry F.Korth, S. Sudarshan , Database system Concepts , 3rd Edition, McGraw – Hill Companies, inc.

**Reference Book(s)**:

1. Arun Majumdar &Pritimoy Bhattacharya, **"Database Management Systems"**, TMH, 2007.
2. Gerald V. Post , **"Database Management Systems"**, 3rd Edition, TMH.

### Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Class Participation | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

### CO-PO-PSO Mapping

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| **21U3CAP304** | **Core Paper IX : Practical in Oracle Programming** |
| **Semester: III** | **Credits: 4**    **CIA : 50 Marks**    **ESE: 50 Marks** |

**Course Objective:**

To make the students to understand Relational Database Management System concepts using Oracle and able to do the various operations on Tables.

**Course Outcomes (CO):**

| CO1 | Remember to transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a |
|---|---|
| CO2 | Understand the processes of Database Development and Administration using SQL and PL/SQL. |
| CO3 | Apply the Programming and Software Engineering skills and techniques using SQL. |
| CO4 | Analyze the relational data model with optimal and feasible solutions |
| CO5 | Evaluate the Optimal Solutions |

**Offered by: Computer Applications**

**Course Content**        **Instructional Hours / Week: 6**

| Prog. No. | List of Programs |
|---|---|
| 1 | Create an Employee table with primary key, foreign key and Insert the Values. |
| 2 | Alter the existing table with an appropriate query, Update the values and retrieve using Select Verb. |
| 3 | Create a table and perform various DCL & TCL Commands |
| 4 | Perform various Single – row and Grouping functions using SQL. |
| 5 | Create an appropriate table and perform various Join Operations. |
| 6 | Create suitable table and perform various Set Operations. |
| 7 | Write a PL/SQL program to check whether the given string is palindrome or not. |
| 8 | Write a PL/SQL Cursor for referencing fields in a record. |
| 9 | Write a PL/SQL to raise the exceptions in Bank Account Management table |
| 10 | Write a PL/SQL program to find factorial of numbers using function and procedure. |
| 11 | Write a PL/SQL to handle package. |
| 12 | Write a PL/SQL trigger for entering mark in the student table. |
| | **Total Hours**      **90** |

**Tools for Assessment (50 Marks)**

| Application of Logic | Program Creativity | Program Debugging | Test 1 | Test 2 | Observation Note Book | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 8 | 10 | 10 | 6 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| **21U3MIA303** | **Allied Paper III: Operations Research** | | |
| **Semester: III** | **Credits: 4** | **CIA: 50 Marks** | **ESE: 50 Marks** |

**(Common to B. Sc. CS / AIML / IT / BCA)**

**Course Objective:**

To enable the students to learn various mathematical applications in industries, decision making for real time environment.

**Course Outcomes:**

| | |
|---|---|
| **CO1** | Interpreting the optimal solutions of LPP using various methods. |
| **CO2** | Summarising the method of solving Transportation and Assignment Problems. |
| **CO3** | Implementing various strategies in solving Game Theory problems. |
| **CO4** | Outlining the Queuing Theory concepts. |
| **CO5** | Identifying the Critical Path and expected duration for a project. |

**Offered by: Mathematics**

**Course Content**                                    **Instructional Hours / Week: 5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Linear Programming:** Mathematical Model assumption of linear Programming | 1 | 2 |
| | Graphical method - Principles of Simplex method, Big-M Method, Duality. | 1 | 3, 4, 5 |
| | **Instructional Hours** | | **15** |
| **II** | **Transportation And Assignment Problem:** Assignment and Traveling Salesman Problem. | 1 | 10, 11 |
| | **Instructional Hours** | | **15** |
| **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, Dominance property | 1 | 17 |
| | **Replacement models** : Elementary replacement models - Present value - Rate of return - Depreciation - Individual replacement – Group replacement. | 1 | 18 |
| | **Instructional Hours** | | **15** |
| **IV** | **Queuing Theory (Derivations not included):** Definition of waiting line model - Queue discipline - Traffic intensity - Poison arrival – Birth death process - | 1 | 20 |
| | Problem from single server: finite and infinite population model . | 1 | 20 |
| | **Instructional Hours** | | **15** |
| **V** | **PERT & CPM:** Network representation - backward pass - Forward pass - computation - Pert Network. | 1 | 21, 22 |
| | **Instructional Hours** | | **15** |
| | **Total Hours** | | **75** |

**Text Book(s):**
1. Kanti Swarup, P.K. Gupta, Man Mohan, **Operations Research,** S. Chand & Sons, 1997.
   Unit 1: Chapter 2, 3, 4, Section : 4.1, 4.3, 4.4 (Big-M Method only)
   Chapter 5, Section: 5.1, 5.2, 5.3, 5.4, 5.7
   Unit II: Chapter 10 Section: 10.1, 10.2, 10.3, 10.5, 10.6 10.8, 10.9, 10.10.
   Chapter 11
   Unit III: Chapter 17, Section: 17.1 – 17.7.
   Chapter 18, Section: 18.1 – 18.3.
   Unit IV: Chapter 20, Section: 20.1 – 20.4, 20.6, 20.7, 20.8 (Model I, III, V, VI)
   Unit V  : Chapter 21
   Chapter 22, Section: 22.1, 22.2, 22.3.

**Reference Book(s):**
1. Hamdy A Taha, **Operations Research – An introduction,** Prentice Hall of India PVT.LTD, 8th edition, 2008.
2. J. K. Sharma, **Operations Research Theory and Applications**, MacMillan India Ltd,2008.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Seminar | Class Participation | Periodical Quizzes | Total |
|-------|--------|---------|---------|---------------------|--------------------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | M | L | M | M | L | M | H | H | H | H | M | M |
| CO2 | H | M | L | M | H | M | M | M | H | H | H | M | M |
| CO3 | H | M | L | L | H | M | M | M | H | H | H | H | H |
| CO4 | H | H | L | H | H | H | M | H | H | H | H | H | H |
| CO5 | H | H | L | H | H | H | M | H | H | H | H | H | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HOD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title |
|---|---|
| **21U4CAZ301** | **Skill Based Paper I:** <br> **Practical in Multimedia and its Applications** |
| **Semester: III** | **Credits - 3** · **CIA: 30 Marks** · **ESE: 45 Marks** |

**Course Objective:**

      To make the students to be a proficient in a broad range of design skills and animation.

**Course Outcomes:**

| CO1 | Remember the graphics concepts |
|---|---|
| **CO2** | Understand the multimedia tools and techniques |
| **CO3** | Apply the graphical designs and functions using Photoshop, CorelDraw and Flash |
| **CO4** | Create Professional design & animation |
| **CO5** | Create Animated Objects |

**Offered by: Computer Applications**

**Course Content**                                    **Instructional Hours/Week: 4**

| S. No. | List of Practical for Photoshop |
|---|---|
| 1 | Combine aspects of several images into one professional images using Photoshop. |
| 2 | Animate Plane Flying the Clouds using Photoshop. |
| 3 | Create Plastic Surgery for Nose using Photoshop. |
| 4 | Create 3D shapes and text using Photoshop |
| 5 | Create Web Page using Photoshop. |
| | **List of Practical for CorelDraw** |
| 6 | Create a 3D text in Corel Draw |
| 7 | Create a logo for your department in Corel Draw. |
| 8 | Create an advertisement for a Textile company in Corel Draw. |
| 9 | Using Corel Draw, design a business card for a company. |
| 10 | Using Corel Draw, design a banner for a marriage function. |
| | **List of Practical for Flash** |
| 11 | Create a shape tween and include guide layer using Flash |
| 12 | Create an Advertisement |
| 13 | Create a banner Advertisement using Flash |
| 14 | Create a story telling and representing animatic using flash. |
| 15 | Create an interactive game using Flash ActionScript |
| | **Total Hours        60** |

**Tools for Assessment (30 Marks)**

| Designing | Theme development | Poster Presentation | Test I | Test II | Observation | Total |
|-----------|-------------------|---------------------|--------|---------|-------------|-------|
| 5 | 5 | 5 | 6 | 6 | 3 | 30 |

**Mapping**

| PO\CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HOD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | |
|---|---|---|
| **21U4NM3BT1** | **Part IV – BASIC TAMIL - I** | |
| **Semester: III** | **Credits: 2** | **CIA : 50 Marks** |

**(Common to all UG Programmes)**

**Course Objective:** தமிழ் மொழியைக் கற்பித்தல் - மொழித்திறனை வளர்த்தல்

**Course Outcomes:**

| CO1 | தமிழ் எழுத்துக்கள் அறிமுகம் செய்தல் மற்றும் வாசித்தல் ஆகியவற்றின் பயன்பாட்டை அறியச் செய்தல். |
|---|---|
| CO2 | பிறமொழி கற்றல் ஆர்வம் தூண்டல். |
| CO3 | பிறமொழி அறிவுத் திறன் மேம்படச் செய்தல். |
| CO4 | வார்த்தை அமைக்கும் திறன் பெறச் செய்தல். |
| CO5 | கையெழுத்துத்திறன் பெறச் செய்தல். |

**Offered by :** தமிழ்த்துறை

**Course Content**                                    **Instructional Hours / Week: 2**

| Unit | Description | |
|---|---|---|
| **I** | **தமிழ் மொழியின் அடிப்படைக் கூறுகள்**<br><br>1. எழுத்துக்கள் - உயிர் எழுத்துக்கள்<br>2. மெய் எழுத்துக்கள்<br>3. உயிர்மெய் எழுத்துக்கள் | |
| | **Instructional Hours** | **10** |
| **II** | **சொல் அமைத்தல்**<br><br>1. ஓர் எழுத்து ஒரு மொழி<br>2. இரண்டு முதல் ஐந்து எழுத்துச் சொற்கள்<br>3. தமிழ் மாதங்கள் பெயர், கிழமைகளின் பெயர்<br>4. வண்ணங்கள் பெயர்<br>5. சொல் அக்கம் | |
| | **Instructional Hours** | **5** |
| **III** | **தொடரமைப்பு**<br><br>1. எழுவாய்<br>2. செயப்படுபொருள்<br>3. பயனிலை | |
| | **Instructional Hours** | **5** |
| **IV** | **குறிப்பு எழுதுதல்**<br>1. தொடரமைப்பு<br>2. பத்தி அமைப்பு | |
| | **Instructional Hours** | **5** |
| **V** | **பிழை நீக்குதல்**<br><br>1. ஒற்றுப்பிழை<br>2. வாக்கியப் பிழை | |
| | **Instructional Hours** | **5** |
| | **Total Hours** | **30** |

பாடத்தொகுப்பு :

இளங்கலை தமிழ் மாணவர்களுக்குரிய பாட நூல் **"அரிச்சுவடி"**
தொகுப்பு: தமிழ்த்துறை, நேரு கலை அறிவியல் கல்லூரி, கோயம்புத்தூர்.

பார்வை நூல்கள்:

1. பவணந்தி முனிவர், நன்னூல் பூலியூர்க்கேசிகன் உரை,சாரதா பதிப்பகம், சென்னை - 40.

2. தொல்காப்பியம், கணேசஐயர் பதிப்பு, உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை - 113.

3. அ.கி.பரந்தாமனார் - நல்லதமிழ் எழுதவேண்டுமா? அல்லி நிலையம், சென்னை - 007.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Writing Skills | Reading Skills | Translation Knowledge | Total |
|-------|--------|---------|----------------|----------------|------------------------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | - | - | H | - | H | M | H | H | - | - | - | - | L |
| CO2 | - | - | H | - | M | M | L | H | - | - | - | - | L |
| CO3 | - | - | H | - | L | M | M | H | - | - | - | - | L |
| CO4 | - | - | M | - | L | M | H | M | - | - | - | - | L |
| CO5 | - | - | H | - | M | M | H | H | - | - | - | - | L |

**H-High; M-Medium; L-Low;**

| Course Designed by | Verified by | Checked by | Approved by |
|--------------------|-------------|------------|-------------|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| 21U4NM3AT1 | Part IV – Advanced Tamil - I |
| Semester : III | Credits : 2 | ESE : 50 Marks |

**(Common to all UG Programmes)**

Course Objective    :  புதுக்கவிதை உருவாக்கும் திறன் வளர்த்தல்- மொழித்திறன் மேம்படுத்தல்

Course Outcomes    :

| CO1 | புதுக்கவிதை உருவாக்கும் திறன் வளர்த்தல் |
|---|---|
| CO2 | தொடர் மற்றும் பத்திகளில் பிழையின்றி எழுதச் செய்தல் |
| CO3 | மொழியைப் பிழையின்றிப் பேச, எழுதும் திறன்பெறச் செய்தல் |
| CO4 | கடிதம் எழுதுதல் மற்றும் மொழியறிவைப் பெறுதல். |
| CO5 | படைப்பாக்கத்திறன் அறிவுபெறச் செய்தல். |

**Offered by :**   தமிழ்த்துறை

**Course Content**                               **Instructional Hours / Week : 2**

| Unit | Description | |
|---|---|---|
| I | புதுக்கவிதை<br>  1. பாரதியார்– புதுமைப்பெண்<br>  2. பாரதிதாசன் - இருண்டவீடு | |
| | | Instructional Hours   10 |
| II | பிழை நீக்குதல்<br>  1. வார்த்தைப் பிழை நீக்கம்<br>  2. தொடர் பிழை நீக்கம்<br>  3. பத்தி எழுதச் செய்தல் | |
| | | Instructional Hours   5 |
| III | இலக்கணப் பயிற்சி அளித்தல்<br>  1. தொகைநிலைத் தொடர்<br>  2. தொகாநிலைத் தொடர்<br>  3. ஆகுபெயர், ஆகுபெயர் வகைகள் | |
| | | Instructional Hours   5 |
| IV | கடிதம் எழுதுதல்<br>  1. பாராட்டுக் கடிதம்<br>  2. நன்றிக் கடிதம்<br>  3. அழைப்புக் கடிதம்<br>  4. அலுவலகக் கடிதம் | |
| | | Instructional Hours   5 |
| V | இலக்கிய வரலாறு<br>  1. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்<br>  2. பாரதியார்- குறிப்பு வரைக.<br>  3. பாரதிதாசன் - குறிப்பு வரைக. | |
| | | Instructional Hours   5 |
| | | Total Hours   30 |

**பாடத்தொகுப்பு**

    இளங்கலை முதலாம் ஆண்டு தமிழ் மாணவர்களுக்குரிய பாடநூல் **"திரட்டு"**
    தொகுப்பு: தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர் - 105

**பார்வை நூல்கள்**

1. பாரதியார் - பாரதியார் கவிதைகள், அபிராமிபதிப்பகம்,7- பி,கொடிமரத் தெரு, சென்னை - 013

2. பவணந்திமுனிவர் - நன்னூல் பூலியூர்க்கேசிகன் உரை, சாரதா பதிப்பகம், சென்ஜ - 040

3. தமிழண்ணல் - புதியநோக்கில் தமிழ் இலக்கிய வரலாறு,மீனாட்சி புத்தக நிலையம், மதுரை - 001.

4. அ.கி. பரந்தாமனார்-நல்லதமிழ் எழுத வேண்டுமா? அல்லிநிலையம், சென்னை - 600 007.

5. கா..கோ.வேங்கடராமன்- தமிழ் இலக்கிய வரலாறு தமிழ்மண் பதிப்பகம் - நாமக்கல்.

6. மாணவர் தமிழ் இலக்கணம் - புலவர்.கவியழகன், எம்.ஏ.,சூடாமணி பிரசுரம், சென்னை - 083.

## Mapping

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | - | - | M | - | M | L | L | M | - | - | - | - | L |
| CO2 | - | - | H | - | M | H | M | H | - | - | - | - | L |
| CO3 | - | - | H | - | L | L | H | H | - | - | - | - | L |
| CO4 | - | - | H | - | M | L | M | H | - | - | - | - | L |
| CO5 | - | - | M | - | M | L | M | H | - | - | - | - | L |

**H-High; M-Medium; L-Low;**

| Course Designed by | Verified by | Checked by | Approved by |
|--------------------|-------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | |
|---|---|---|
| **21U4NM3CAF** | **Non Major Elective : Consumer Affairs** | |
| **Semester : III** | **Credits : 2** | **ESE : 50 Marks** |

(Common to all UG Programmes)

## Course Outcomes:

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

| CO1 | Know their rights and responsibilities as a consumer |
|---|---|
| CO2 | Gain knowledge about Legal framework of protecting consumer rights |
| CO3 | Understand the procedure about redressal of consumer complaints |
| CO4 | Learn about Consumer related regulatory agencies and norms |
| CO5 | Comprehend business firms, interface with consumers |

**Course Content**          **Instructional Hours / Week : 2**

| Unit | Description | Text Book |
|---|---|---|
| **I** | **Conceptual Framework** <br> **Consumer and Markets:** Concept of Consumer, Nature of markets: Liberalization and Globalization of markets with special reference to Indian Consumer Markets, Concept of Price in Retail and Wholesale, Maximum Retail Price (MRP), Fair Price, GST, labeling and packaging along with relevant laws, Legal Metrology. | 1 |
| | Consumer Complaining Behaviour: Alternatives available to Dissatisfied Consumers; Complaint Handling Process | 1 |
| | **InstructionalHours** | **6** |
| **II** | **The Consumer Protection Law in India** <br> **Objectives and Basic Concepts:** <br> Consumer rights and UN Guidelines on consumer protection, Consumer goods, defect in goods, spurious goods and services, deficiency in service, unfair trade practice. | 1 |
| | **InstructionalHours** | **6** |
| **III** | **Grievance Redressal Mechanism under the Indian Consumer Protection Law** <br> Who can file a complaint? Grounds of filing a complaint; Limitation period; Procedure for filing and hearing of a complaint; Disposal of cases, Relief/Remedy available; Temporary Injunction, Offences and penalties. | 1 |
| | **InstructionalHours** | **6** |
| **IV** | **Role of Industry Regulators in Consumer Protection** – industry self-regulation (ISR), Protection policies, Consumer Protection Agencies <br> i. Telecommunication: TRAI <br> ii. Food Products: FSSAI <br> iii. Insurance : IRDA and Insurance Ombudsman | 1 |
| | **Instructional Hours** | **6** |

| | | |
|---|---|---|
| **V** | **Contemporary Issues in Consumer Affairs** <br> **Consumer Movement in India:** Formation of consumer organizations and their role in consumer protection, Misleading Advertisements and sustainable consumption, National Consumer Helpline, Comparative Product testing. | 1 |
| | **Quality and Standardization:** Voluntary and Mandatory standards; Role of BIS, Indian Standards Mark (ISI), Ag-mark, Hallmarking, Licensing and Surveillance. | 1 |
| | **Instructional Hours** | **6** |
| | **Total Hours** | **30** |

**Text book**

1. "Consumer Affairs", Compiled by Department of Business Administration, Nehru Arts and Science College.

**Suggested Readings**

1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi. (2007) Consumer Affairs, Universities Press.

2. Choudhary, Ram Naresh Prasad (2005). Consumer Protection Law Provisions and Procedure, Deep and Deep Publications Pvt Ltd.

3. G. Ganesan and M. Sumathy. (2012). Globalisation and Consumerism: Issues and Challenges, Regal Publications

4. Suresh Misra and Sapna Chadah (2012). Consumer Protection in India: Issues and Concerns, IIPA, New Delhi

5. Rajyalaxmi Rao (2012), Consumer is King, Universal Law Publishing Company

6. Girimaji, Pushpa (2002). Consumer Right for Everyone,Penguin Books.

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | L | - | – | – | M | H | H | M | - | - | - | - | L |
| **CO2** | L | - | – | – | M | H | H | M | - | - | - | - | L |
| **CO3** | L | - | – | – | M | H | M | M | - | - | - | - | L |
| **CO4** | L | - | – | – | M | H | H | M | - | - | - | - | L |
| **CO5** | L | - | – | – | M | H | H | M | - | - | - | - | L |

**H-High; M-Medium; L-Low**

| **Course Designed by** | **Verified by HOD** | **Checked by** | **Approved by** |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| 21U4NM3GTS | Non Major Elective : Gandhian Thoughts |
| Semester : III | Credits : 2 | ESE : 50 Marks |

**(Common to all UG Programmes)**

**Course Objective:**

To make the Students understand the philosophies of Gandhiji and fulfill their duties and responsibilities towards the society.

**Course Outcomes:**

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

| CO1 | Aware about the significance of Gandhian thought |
|---|---|
| CO2 | Understand the applicability of Gandhian methods in the contemporary economic and social demines. |
| CO3 | Analyze the area of truth, non-violence and peace. |
| CO4 | Familiarize with the view of Gandhiji on women |
| CO5 | Delineate the framework of democracy in Gandhian perspective |

**Course Content**        **Instructional Hours/Week** : 2

| Unit | Description | Text Book |
|---|---|---|
| I | **Educational Philosophy of Gandhiji:** Definitions on Education - What is True Education? - Gandhiji's New Scheme of Education - Wardha Scheme of Education - Main Aims of Gandhian Education - Why Gandhiji's Scheme of Education was Called 'Basic Education?' - Features of the Wardha Scheme of Education - Features of Basic Education - The Methodology of Basic Education - The Content of Basic Education - Routine Work of a Basic School | 1 |
| | **Instructional Hours** | 6 |
| II | **Gandhian Concept of Correlation of Studies -** Technique of Correlation - The Place of Teacher in Basic Education - Merits of Basic Education - Educational Scenario after Independence - Influences of Gandhiji on Education Commissions - Basic Schools in the Present Society - Education for Peace – A Gandhian View - Why Basic Education is called a Holistic Model | 1 |
| | **Instructional Hours** | 6 |
| III | **Gandhiji's View on Truth and Non-Violence :** Gandhiji's Words about Truth - Meaning of Truth, Truth is God - Truth and God - The Importance of Truth in Human Life - Absolute and Relative Truth - Realisation of the Self - Liberation. | 1 |
| | **Instructional Hours** | 6 |
| IV | **Mahatma Gandhi's Views on Women :** Status of Women in Pre Independence India - Gandhi's Perception of Women - Role of Women in Family – Perception of Gandhi - Value of Equality - Women in Politics - Gandhiji's Vision to Abolish Social Evils against Women - Role of Women as Envisaged by Gandhi. | 1 |
| | **Instructional Hours** | 6 |

| | | |
|---|---|---|
| **V** | **Gandhiji's View on Democracy :** Problem of Majority and Minority – Democracy,  Gandhian strategies for democratic decentralization, **Gram Swaraj:** City and Village - Gram Swaraj - Critique of Industrialisation -  Critique of Machinery, Participatory Democracy Swarajyam Grama Rajya and Ramarajya. | **1** |
| | **Instructional Hours** | **6** |
| | **Total Hours** | **30** |

**Text Book(s):**
   1. "Gandhian Thoughts", Compiled by Nehru Arts and Science College.

## Mapping

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | L | H | H | L | - | - | - | - | L |
| **CO2** | - | - | - | - | – | H | H | L | - | - | - | - | L |
| **CO3** | - | - | - | - | – | H | H | L | - | - | - | - | L |
| **CO4** | - | - | - | - | – | H | H | L | - | - | - | - | L |
| **CO5** | - | - | - | - | – | H | H | L | - | - | - | - | L |

H-High;  M-Medium;  L-Low;

| **Course Designed by** | **Verified by HOD** | **Checked by** | **Approved by** |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title | |
|---|---|---|
| **21U4NM3WRT** | **Non Major Elective : Women's Rights** | |
| **Semester : III** | **Credits : 2** | **ESE : 50Marks** |

**(Common to all UG Programmes)**

## Course Objective:

To facilitate the awareness about the social, economical, political, intellectual or cultural contributions of Women in India.

## Course Outcomes:

| | |
|---|---|
| **CO1** | Aware of basic constitutional rights |
| **CO2** | Gain awareness on Political rights |
| **CO3** | Understand individual and familial rights |
| **CO4** | Grasp the provisions for Women's Rights in India |
| **CO5** | Develop an understanding of the Protection Mechanisms for women |

**Course Content**        **Instructional Hours / Week : 2**

| Unit | Description | Text book | Chapter |
|---|---|---|---|
| **I** | **Constitutional Rights of Women in India**: Indian constitution relating to women - Fundamental rights - Directive principles of state policy - right to equality - rights against exploitation - cultural and educational rights - the right to constitutional remedy - University Declaration of Human Rights - Enforcement of Human Rights for Women and Children - Role of Cells and Counseling Centers - Legal AID cells, Help line, State and National level Commission | 4 | 2 |
| | **Instructional Hours** | | **6** |
| **II** | **Political Rights of Women in India:** Political Rights of Women in India - Electoral process - women as voters - candidates and leader - pressure group, 73rd and 74th amendment and representation of women in local self-government – women in Rural and urban local bodies - Reservation of women - party ideologies and women's issues. | 5 | 1 |
| | **Instructional Hours** | | **6** |
| **III** | **Women's Rights: Access to Justice** Introduction–Criminal Law–Crime Against Women Domestic Violence – Dowry Related Harassment and Dowry Deaths - Molestation – Sexual Abuse and Rape Loopholes in Practice–Law Enforcement Agency | 3 | **7** |
| | **Instructional Hours** | | **6** |
| **IV** | **Women's Rights** Violence Against Women – Domestic Violence The Protection of Women from Domestic Violence Act, 2005, The Marriage Validation Act, 1982 - The Hindu Widow Re-marriage Act, 1856- The Dowry ProhibitionAct,1961 | 3 | 5 |
| | **Instructional Hours** | | **6** |

| | **Special Women Welfare Laws**<br>Sexual Harassment at Work Places, Rape and Indecent Representation, The Indecent Representation (Prohibition) Act, 1986, Immoral Trafficking, The Immoral Traffic (Prevention) Act, 1956 - Acts Enacted for Women Development and Empowerment, Role of Rape Crisis Centers. Protection of Children from sexual Offences Act 2012 | | |
|---|---|---|---|
| **V** | | 3 | 9 |
| | **Instructional Hours** | | **6** |
| | **Total Instructional Hours** | | **30** |

**Text Books:**

1. Nitya Rao **Good Women do not Inherit Land** Social Science Press and OrientBlackswan2008
2. International Solidarity Network **Knowing Our Rights** An imprint of KaliforWomen2006
3. P. D. Kaushik **"Women Rights"** Book well Publication 2007 UN Centre for Human Rights, Discrimination against Women (Geneva: World Campaign for Human Rights,1994).
4. Agnes, Flavia. (1992). "Give us "Give us This Day Our Daily Bread: Procedures and Case Law on Maintenance". Majlis, Bombay.
5. Agnes, Flavia. (1999). "Law and Gender Inequality: The Politics of Women"s Rights in India". OUP, New Delhi

**Reference Books:**

1. Aruna Goal **Violence Protective Measures for Women Development and Empowerment,** Deep and Deep Publications Pvt.2004
2. Monica Chawla **Gender Justice**, Deep and Deep Publications Pvt. Ltd. 2006
3. Preeti Mishra **Domestic Violence Against Women,** Deep and Deep Publications Pvt.2007
4. Clair M.Renzetti, JeffreyL. Edleson, Raquel Kennedy Bergen, Source Book on **Violence Against Women** Sage Publications 2001

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | L | - | - | H | H | L | - | - | - | - | L |
| **CO2** | - | - | L | - | - | H | H | L | - | - | - | - | L |
| **CO3** | - | - | L | - | - | H | H | L | - | - | - | - | L |
| **CO4** | - | - | L | - | - | H | H | L | - | - | - | - | L |
| **CO5** | - | - | L | - | - | H | H | L | - | - | - | - | L |

H-High; M-Medium; L-Low

| **Course Designed by** | **Verified by HOD** | **Checked by** | **Approved by** |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title | | |
|---|---|---|---|
| **21U3CAC405** | **Core Paper X:  Visual Programming** | | |
| **Semester: IV** | **Credits: 3** | **CIA: 30 Marks** | **ESE:45 Marks** |

## Course Objectives:

To understand the concept of GUI Design Tool, also to make them aware of controls in VB.NET by coding programs and develop interface using Visual Basic .NET.

## Course Outcomes:

| CO1 | Remember the .Net Framework and Controls |
|---|---|
| **CO2** | Understand the Structures and OOPs Concepts |
| **CO3** | Develop and implement windows, console and web-based application |
| **CO4** | Examine webpage, file management, ADO.Net for Database Connection |
| **CO5** | Understand and ability to design ASP Page |

## Offered by: Computer Applications

**Course Content**                               **Instructional Hours/Week: 5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | What is .Net? – An Overview of the .Net Framework- The Common Language Runtime – The.Net Class Framework. **Introduction VB.Net:** Visual Studio.Net – Working with VB.Net – **Variables and Types:** Difference of value and Reference Types – Value Types – explicit Conversion – Reference Types. | 1 | 1,2,4 |
| | **Instructional Hours** | | **15** |
| **II** | **Object Syntax Introduction:** Object Oriented Terminology – Working with objects- Creating Classes – Advanced Concepts. **Inheritance and Interface:** Inheritance – Multiple Inheritance - Abstraction – Encapsulation – Polymorphism – What is Namespace? - Exception in .Net – Structured Exception Handling Keywords in VB.Net. | 1 | 5,6,7,8,9 |
| | **Instructional Hours** | | **15** |
| **III** | **Windows Forms:** Forms as classes – Forms at Design Time – Forms at Runtime - **Controls** – **Data Access with ADO.Net:** why do we need ADO.Net? – The ADO.Net Architecture - .Net Data Provider – The Dataset Component. | 1 | 11,12 |
| | **Instructional Hours** | | **15** |
| **IV** | What is ASP.Net? – Setting up for ASP.Net – An Overview Programming Basics – Basics of Programming – ASP.Net Data types – Operators – Common ASP.Net Page Syntax – Built-in ASP.Net objects and interactivity- The Response object – The ASP Server object. | 2 | 1,2,3 |
| | **Instructional Hours** | | **15** |
| **V** | Web Forms and ASP.Net – Web Forms – ASP.Net and Configuration – ASP.Net and state- The Application Scope – ASP Sessions – The Session Object – The Scripting Object Model – Active Server Components and Controls– More Active Server Component. | 2 | 4,5,6 |
| | **Instructional Hours** | | **15** |
| | **Total Hours** | | **75** |

**Text Book(s):**
1. Bill Evjen, Billy Hollis, Rockford Lhotka, Tim McCarthy, Jonathan Pinnock, Rama Ramachandran,BillSheldon, **"Professional VB.Net 2003"**, Wiley India Edition, Reprint 2007.
2. Dave Mercer, **"ASP.Net: A Beginner's Guide"**, Tata McGraw Hill, Fifth Reprint 2008.

**Reference Book(s):**
1. Peter Aitken's **"Visual Basic .Net Programming"**, Dreamtech Press, Reprint 2004.
2. Steven Holzner, **"Visual Basic .Net Programming",**Dreamtech Press, 2005 Edition.
3. MridulaParihar,**"ASP.Net Bible"**, Wiley India Edition, Reprint 2007.
4. George Shepherd, **"Microsoft VB.Net 2.0",** Prentice Hall, 2005.

**Tools for Assessment (30 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Mini Project | Total |
|-------|--------|---------|------------|---------|--------------|-------|
| 4 | 4 | 7 | 5 | 5 | 5 | 30 |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

H-High; M-Medium; L-Low

| Course Designed by | Verified by | Checked by | Approved by |
|--------------------|-------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | | | |
|---|---|---|---|---|---|
| **21U3CKC408** | **Core Paper XI: Software Engineering** | | | | |
| **Semester: IV** | **Credits: 4** | | **CIA: 50 Marks** | **ESE: 50 Marks** | |

**(Common to B. Sc. IT / BCA)**

**Course Objective:**

To gain knowledge about basic concepts of Software Engineering and Testing.

**Course Outcomes:**

| CO1 | Able to understand the nature of the software and different types of process models |
|---|---|
| CO2 | Gains knowledge about the requirements stage development of the software |
| CO3 | Analyse the different types of architectural designs of the software |
| CO4 | Setting the context on Software Development and Evaluates different testing strategies of the software |
| CO5 | Understand the testing types and test automation |

**Offered by: Computer Applications**

**Course Content**          **Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Introduction to Software Engineering:** Evolving role of software- Software- The changing nature of Software- Software Myths. A Generic view of Process- A Layered Technology | 1 | 1 |
| | **Software Process Models:** Prescriptive models- The Waterfall Model - Incremental Process Models- Evolutionary Process Models. | 1 | 3 |
| | **Instructional Hours** | | **18** |
| **II** | **Requirements Engineering:** Requirements Engineering Tasks- Initiating the Requirements Engineering Process- Eliciting Requirements- Building the Analysis Model. | 1 | 7 |
| | **Building the Analysis Model:** Scenario-Based Modelling- Flow Oriented Modelling. | 1 | 6 |
| | **Instructional Hours** | | **18** |
| **III** | **Design Engineering:** Design Concepts -The design model. | 1 | 9 |
| | **Creating an Architectural Design:** Representing the System in Context- Defining Archetypes- Refining the Architecture into Components- Describing Instantiations of the System. | 1 | 10 |
| | **Modelling Component-Level Design:** What is a Component – Designing Class-Based Components. | 1 | 11 |
| | **User Interface Design:** User Interface Analysis and Design-Interface Design steps. | 1 | 12 |
| | **Instructional Hours** | | **18** |
| **IV** | **Software Development Life Cycle models:** Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation**. White-Box Testing-** Static Testing – Structural Testing. **Black-Box Testing**- Black-Box Testing procedures. | 2 | 2,3,4 |
| | **Instructional Hours** | | **18** |

| V | **Integration Testing**: Integration Testing as Type of Testing – Integration Testing as a Phase f Testing – Scenario Testing – Defect Bash. **System and Acceptance Testing**: system Testing Overview — Functional versus Non-functional Testing - Functional testing - Non-functional Testing – Acceptance Testing. **Performance Testing**: Methodology of Performance Testing – tools for Performance Testing **Regression Testing**: Regression Testing overview – Types of Regression Testing - Test Automation. | 2 | 5,6,7, 8,16 |
|---|---|---|---|
| | | **Instructional Hours** | **18** |
| VI | **Contemporary Issues:**<br>  o   Workshop on Software Tools.<br>  o   Seminar on Various Software Models.<br>  o   Guest Lecture on Software development Lifecycle | | |
| | | **Total Hours** | **90** |

**Text Book(s):**
1. Roger S Pressman, **"Software Engineering a Practitioner's Approach"**, Sixth Edition, McGraw Hill, International Edition, 2013
2. Srinivasan Desikan, Gopalaswamy Ramesh, **"Software Testing Principles and Practices"**, Pearson, 2006.

**Reference Books(s):**
1. Richard Fairley, **"Software Engineering Concepts"**, Tata McGraw-Hill Publishing Company Limited, 2010.
2. Waman S. Jawadekar, **"Software Engineering – Principles and Practice"**, Tata McGraw Hill Publishing Company Limited, 2011.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Case study Analysis | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| **8** | **8** | **10** | **8** | **8** | **8** | **50** |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | M | M | M | L | M | H | H | H | H | M | M |
| **CO2** | H | H | M | M | M | L | M | H | H | H | H | M | M |
| **CO3** | H | H | M | M | M | L | M | H | H | H | H | H | H |
| **CO4** | H | H | M | M | M | L | M | H | H | H | H | H | H |
| **CO5** | H | H | M | M | M | L | M | H | H | H | H | H | H |

**H-High; M-Medium: L-Low**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| **21U3CAP406** | **Core Paper XII : Practical in Visual Programming** |
| **Semester: IV** | **Credits: 4**     **CIA : 50   Marks**     **ESE: 50   Marks** |

**Course Objectives:**

- To inculcate the programming algorithm, process, and structure of VB.Net and ASP.Net.
- To demonstrate the connectivity from VB.Net and ASP.Net to MS Access and Oracle.

**Course Outcomes (CO):**

| CO1 | Remember the various Controls. |
|---|---|
| CO2 | Understand the methods and properties of Controls. |
| CO3 | Apply the structure to design window based and Web Base Applications. |
| CO4 | Analyze the optimal and feasible solution. |
| CO5 | Evaluate the feasibility of the solution to be implemented. |

**Offered by: Computer Applications**

**Course Content**            **Instructional Hours / Week: 6**

| Prog. No. | List of Programs |
|---|---|
| 1 | Write VB.Net program to develop a calculator with basic operations. |
| 2 | Write VB.Net program to create menus in a form using menu editor. |
| 3 | Design a form in VB.Net using common dialog control to display the save and open dialog box. |
| 4 | Write  VB.Net program to maintain student mark list using MS Access |
| 5 | Write  VB.Net  program for a various font application |
| 6 | Write VB.Net program to use a tool bar to set editor properties. |
| 7 | Write VB.Net program to create and reading text file. |
| 8 | Write VB.Net program to implement a binary search using collection class. |
| 9 | Design College Website using ASP.Net. |
| 10 | Write ASP.Net Program to create online examination system. |
| 11 | Write ASP.Net Program to develop website for online mobile shop. |
| 12 | Design Online Registration Form using ASP.Net |
|  | **Total Hours**        **90** |

**Tools for Assessment (50 Marks)**

| Program Debugging | Problem solving | Mini Project | Test 1 | Test 2 | Observation Note Book | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 8 | 10 | 10 | 6 | 50 |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

H-High; M-Medium; L-Low

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| **21U3BAA404** | **Allied Paper IV:  Accounting for Cost and Management** | | |
| **Semester: IV** | **Credits: 4** | **CIA: 50 Marks** | **ESE:50 Marks** |

**Course Objective:**

To enable the students to know the fundamental concepts of Accounting

**Course Outcomes:**

| CO1 | Capable of fixing product price |
|---|---|
| CO2 | Ability to prepare quotations and tenders |
| CO3 | Ability to differentiate Financial, Cost and Management Accounting |
| CO4 | Interpret the Financial Statement |
| CO5 | To draw different types of budgets |

**Offered by: Commerce**

**Course Content**          **Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | Introduction-Accounting Principles-Branches of Accounting-Accounting rules | 1 | 1 |
| | Journal  - Ledger – Subsidiary Books | 1 | 2 |
| | Trial Balance | 2 | 3 |
| | **Instructional Hours** | | **18** |
| **II** | Preparation of Final accounts: Trading Account, Profit & Loss Account and Balance Sheet | 1 | 3,4 |
| | Depreciation – Accounting for Methods of providing depreciation – straight line method, Written Down Value method | 2 | 11 |
| | **Instructional Hours** | | **18** |
| **III** | Cost Accounts – meaning- elements of cost | 4 | 1 |
| | Preparation of cost sheet (simple problems only) | 5 | 2 |
| | **Instructional Hours** | | **18** |
| **IV** | Material cost: stores ledger – FIFO-LIFO- weighted Average, simple Average | 5 | 3 |
| | Management Accounting – meaning- objectives- Management Account with Financial Account, Management Accounting & Cost Accounting | 3 | 1 |
| | **Instructional Hours** | | **18** |
| **V** | Budget  and  Budgetary  control – preparation  of  various budgets- Flexible Budget - Production Budget-Cash Budget-Sales Budget. | 3 | 10 |
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Book(s):**

1. N.P. Srinivasan and Sakthivel Murugan , **"Accounting for Management",** Sultan Chand & Sons, 2012.
2. T.S. Reddy and A. Murthy, **"Financial Accounting"** , Margham Publications, 2016.
3. Shashi K. Gupta and R.K. Sharma, '**Management Accounting"**, Kalyani Publishers, 2006.
4. S.P. Jain and KL. Narang , **"Cost Accounting"**, Kalyani Publishers, New Delhi.Edn.2014.
5. Dr. A. Murthy & Dr. S. Gurusamy**, "Cost Accounting" ,** Vijay Nicole Imprints Private Limited, Channai. 2014.

**Reference Books:**

1. T.S Reddy and A. Murthy, **"Financial Accounting"**, Margham Publications, 2015.
2. T.S Reddy and A. Murthy, **" Management Accounting"**, Kalyani publishers, 2009.
3. T.S.Grewal, **"Double Entry Book Keeping"**, Sultan Chand &Sons., 2004.
4. Reddy & Hari Prasad Reddy, **"Cost Accounting"**, Margham Publications, 2009

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Class Participation | Total |
|-------|--------|---------|------------|---------|---------------------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO 1 | H | H | M | M | M | L | M | M | L | M |
| CO 2 | H | H | H | M | L | H | L | H | H | M |
| CO 3 | H | H | H | H | H | M | H | H | M | H |
| CO 4 | H | M | H | H | M | L | M | M | L | H |
| CO 5 | H | H | M | M | H | H | H | H | M | M |

**H-High; M-Medium; L-Low.**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| **21U4CAZ402** | **Skill Based Paper II:** <br> **Practical in Web Programming using PHP and MySQL** | | |
| **Semester : IV** | **Credits : 3** | **CIA: 30  Marks** | **ESE: 45 Marks** |

**Course Objective:**

To make the students to improve the skill set in developing Web sites using the open source software PHP and MySQL.

**Course Outcomes:**

| CO1 | To Understand how to code a   PHP application and other programming concepts. |
|---|---|
| CO2 | To Understand how to work with   arrays and string functions. |
| CO3 | To Create applications using forms, files, sessions and cookies. |
| CO4 | To Design and Implement database applications. |
| CO5 | To Create dynamic web Pages. |

**Offered by: Computer Applications**

**Course Content**                                  **Instructional Hours/Week: 4**

| S. No. | List of Practical |
|---|---|
| 1 | Write a PHP program to illustrate Conditional and Looping Statements. |
| 2 | Write a PHP program to demonstrate Array Functions, string, numeric and date functions. |
| 3 | Write a PHP program to create user defined functions. |
| 4 | Write a PHP program for file creation and file manipulation. |
| 5 | Write a PHP program for creating sessions. |
| 6 | Write a PHP program for creating cookies |
| 7 | Create a Simple application using forms in PHP |
| 8 | Write a PHP program for creating tables with constraints and demonstrate table join. |
| 9 | Write a PHP program for Database connectivity, Create, Insertion, Updating and Deleting rows in MySQL tables |
| 10 | Write a PHP program for sorting and searching a data. |
| 11 | Write a PHP Program to illustrate the usage of subqueries, aggregate functions, set operators. |
| 12 | Write a PHP program to create a simple web page. Validate the Input and apply appropriates to format the output. |
| | **Total Hours**       **60** |

**Tools for Assessment (30 Marks)**

| Web page Development | Debugging | Mini Project | Test I | Test II | Observation | Total |
|---|---|---|---|---|---|---|
| 5 | 5 | 5 | 6 | 6 | 3 | 30 |

**Mapping**

| PO\CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HOD | Checked by | Approved by |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title |
|---|---|
| **21U4NM4BT2** | **Part IV – Basic Tamil - II** |
| **Semester : IV** | **Credits : 2** | **CIA : 50 Marks** |

**(Common to all UG Programmes)**

**Course Objective:** அற இலக்கியங்களை அறிமுகப்படுத்தல்

**Course Outcomes:**

| CO1 | நீதிநூல்களின் வழி போதனைகளை மாணவர்களுக்கு எடுத்துரைத்தல் |
|---|---|
| CO2 | திருக்குறளின் சிறப்புகளை எடுத்துரைத்தல் |
| CO3 | நீதிக்கதைகளைக் கூறுவதன் மூலம் மாணவர்களுக்கு நற்சிந்தனைகளை வளர்த்தல் |
| CO4 | கிராமியக் கதைகளைக் கூறுவதன் மூலம் மாணவர்களுக்கு நல்அறிவை வளர்த்தல் |
| CO5 | தமிழ் ஆங்கில மொழிப் பயிற்சியின் மூலம் இருமொழித்திறனை வளர்த்தல் |

**Offered by : தமிழ்த்துறை**

**Course Content**                                                      **Instructional Hours / Week : 2**

| Unit | Description |
|---|---|
| **I** | **நீதி நூல்கள்** |
| | 1. பாரதியார் - ஆத்திச்சூடி – முதல் 12 வரிகள் <br> 2. கொன்றைவேந்தன் முதல் 7 வரிகள் |
| | **Instructional Hours**    **10** |
| **II** | **திருக்குறள்** |
| | கடவுள் வாழ்த்து - அகரமுதல எனத் தொடங்கும் - அதி. - 1 குறள் - 1 <br> வான் சிறப்பு - நீரின்றி அமையாது உலகு - அதி. - 2 குறள் - 10 <br> அன்புடைமை - அன்பின் வழியது உயிர்நிலை - அதி. - 8 குறள் - 10 <br> கல்வி - கண்ணுடையார் என்பர் - அதி. - 40 குறள் - 3 <br> இனியவை கூறல் - இனிய உளவாக இன்னாத - அதி. - 10 குறள் - 10 |
| | **Instructional Hours**    **5** |
| **III** | **நீதிக்கதைகள்** |
| | முல்லாவின் வேடிக்கைக் கதைகள், பீர்பால் கதைகள் |
| | **Instructional Hours**    **5** |
| **IV** | **கிராமியக் கதைகள்** |
| | 1. பரமார்த்தகுரு கதைகள் <br> 2. நாட்டுப்புறக் கதைகள் அறிமுகம் |
| | **Instructional Hours**    **5** |
| **V** | **மொழிப் பயிற்சி** |
| | 1. பிறமொழிச்சொற்களுக்கு தமிழ்ச்சொல் எழுதுதல் <br> 2. தன்விவரம் எழுதுதல் <br> 3. எங்கள் கல்லூரி |
| | **Instructional Hours**    **5** |
| | **Total Hours**    **30** |

**பாடத்தொகுப்பு :**

இளங்கலை தமிழ் மாணவர்களுக்குரிய பாட நூல் **"அரிச்சுவடி"**

**தொகுப்பு**: தமிழ்த்துறை, நேரு கலை அறிவியல் கல்லூரி, கோயம்புத்தூர்.

பார்வை நூல்கள் :

1. ஒளவையார் ஆத்திச்சூடி மணிவாசகர் பதிப்பகம்,கோயம்புத்தூர் இராஜவீதி - 01.

2. திருக்குறள் - பரிமேலழகர் உரை,மணிவாசகர் பதிப்பகம்,சென்னை -600 018.

3. முல்லாவின் வேடிக்கைக் கதைகள் - முல்லை பி.எல்.முத்தையா சென்னை - 007.

4. நாட்டுப்புறவியல் ஓர் ஆய்வு - சு.சக்திவேல் பாரி நிலையம்,சென்னை - 01

## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Writing Skills | Reading Skills | Translation Knowledge | Total |
|-------|--------|---------|----------------|----------------|-----------------------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | - | - | H | - | H | M | H | H | - | - | - | - | L |
| CO2 | - | - | H | - | H | H | M | H | - | - | - | - | L |
| CO3 | - | - | M | - | M | H | M | H | - | - | - | - | L |
| CO4 | - | - | M | - | L | M | H | M | - | - | - | - | L |
| CO5 | - | - | H | - | H | M | H | H | - | - | - | - | L |

**H-High; M-Medium; L-Low;**

| Course Designed by | Verified by | Checked by | Approved by |
|--------------------|-------------|------------|-------------|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| **21U4NM4AT2** | Part IV – Advanced Tamil - II |
| **Semester : IV** | **Credits : 2** ~ **ESE : 50 Marks** |

<div align="center">(Common to all UG Programmes)</div>

**Course Objective :** தமிழ் நூல்களின் வழி அறச் சிந்தனைகளை உருவாக்குதல் செம்மொழியினைச் செம்மைப்படுத்துதல்.

**Course Outcomes :**

| CO1 | அறச் சிந்தனைகளை மாணவர்களுக்கு ஏற்படுத்துதல் |
|---|---|
| **CO2** | தமிழ் சிறுகதைகளின் மூலம் நல்ல சிந்தனைகளை உருவாக்குதல் |
| **CO3** | மொழியைப் பிழையின்றிப் பேச, எழுதும் திறன் பெறச்செய்தல் |
| **CO4** | இலக்கண அறிவை வளர்ப்பதன் மூலம் மரபுப் பிழையின்றி பேசவும், எழுதும் திறனை வளர்த்தல் |
| **CO5** | படைப்பாக்கத்திறன் அறிவுபெறச் செய்தல். |

**Offered by :** தமிழ்த்துறை

**Course Content**                           **Instructional Hours / Week : 2**

| Unit | Description | |
|---|---|---|
| **I** | பதினெண் கீழ்க்கணக்கு நூல் - திருக்குறள் <br> 1. வாய்மை <br> 2. கூடாநட்பு <br> 3. செய்ந்நன்றியறிதல் | |
| | **Instructional Hours** | **10** |
| **II** | சிறுகதை <br> வெ.இறையன்பு - பூனாத்தி சிறுகதைகள் <br> 1. விடுகதை <br> 2. நண்பர்கள் | |
| | **Instructional Hours** | **5** |
| **III** | எழுத்துப் பிழை நீக்க வழிகள் <br> 1. சொற்களைச் சரியாகப் பயன்படுத்தும் முறை <br> 2. வினைச் சொற்கள், பெயர்ச்சொற்கள் | |
| | **Instructional Hours** | **5** |
| **IV** | வழக்கறிதல் <br><br> 1. மரபு வழக்கு <br> 2. இயல்பு வழக்கு <br> 3. தகுதி வழக்கு அறிதல் | |
| | **Instructional Hours** | **5** |
| **V** | படைப்பாற்றல் பயிற்சி <br> குவிதை — சிறுகதை - நூல் மதிப்பீடு எழுதுதல் | |
| | **Instructional Hours** | **5** |
| | **Total Hours** | **30** |

பாடத்தொகுப்பு

இளங்கலை முதலாம் ஆண்டு தமிழ் மாணவர்களுக்குரிய பாடநூல் **"திரட்டு"**
தொகுப்பு: தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர் - 105


பார்வை நூல்கள்

1. திருக்குறள் - பரிமேலழகர் உரை, மணிவாசகர் பதிப்பகம், சென்னை - 018
2. தமிழண்ணல் - புதியநோக்கில் தமிழ் இலக்கிய வரலாறு மீனாட்சி புத்தக நிலையம், மதுரை - 001.
3. அ.கி. பரந்தாமனார்– நல்லதமிழ் எழுதவேண்டுமா? அல்லிநிலையம், சென்னை -600 007.

4. பவணந்திமுனிவர், நன்னூல் பூலியூர்க்கேசிகன் உரை, சாரதா பதிப்பகம், சென்னை -040

5. வெ.இறையன்பு - பூனாத்தி, கவிதா பதிப்பகம், சென்னை.

## Mapping

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | - | - | H | - | H | H | M | H | - | - | - | - | L |
| CO2 | - | - | H | - | M | L | H | M | - | - | - | - | L |
| CO3 | - | - | H | - | H | L | H | H | - | - | - | - | L |
| CO4 | - | - | M | - | M | L | H | H | - | - | - | - | L |
| CO5 | - | - | H | - | H | M | H | M | - | - | - | - | L |

**H-High; M-Medium; L-Low;**

| Course Designed by | Verified by | Checked by | Approved by |
|--------------------|-------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title |
|-------------|-------|
| **21U4NM4GEN** | **Non Major Elective : General Awareness** |
| **Semester : IV** | **Credits : 2** | **ESE : 50 Marks** |

**(Common to all UG Programmes)**

**Course Objective:**

Enable the students to learn General knowledge and prepare for different competitive exams.

**Course Outcomes:**

| CO1 | Determine Verbal Aptitude , Numerical Aptitude and Logical Reasoning |
|-----|---------------------------------------------------------------------|
| CO2 | Recall basic Science, history , Tamil , Computer , Commerce concepts which would help to crack competitive Examinations |
| CO3 | Acquire time Management skills to attempt competitive Examinations |
| CO4 | Develop Aptitude and problem solving skills |
| CO5 | Gain Knowledge about Current Affairs |

**Course Content**                            **Instructional Hours / Week : 2**

| S. No. | Topics |
|--------|--------|
| 1. | Verbal Aptitude |
| 2. | Numerical Aptitudeand Logical Reasoning |
| 3. | Abstract Reasoning |
| 4. | Tamil and Other Literature |
| 5. | General Science and Technology |
| 6. | Computer |
| 7. | Economics and Commerce |
| 8. | History and Freedom Struggle |
| 9. | Sports |
| 10. | Current Affairs |
| | **Total Hours : 30** |

**Text Book:** "General Awareness", compiled by Nehru Arts and Science College, Coimbatore

## Mapping

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | L | - | - | H | - | - | L | - | - | - | - | L |
| CO2 | H | L | - | - | H | - | - | L | - | - | - | - | L |
| CO3 | H | L | - | - | H | - | - | L | - | - | - | - | L |
| CO4 | H | L | - | - | H | - | - | L | - | - | - | - | L |
| CO5 | H | L | - | - | H | - | - | L | - | - | - | - | L |

**H-High;  M-Medium;  L-Low**

| Course Designed by | Verified by HOD | Checked by | Approved by |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title |
|---|---|
| **21U4HVY402** | **Value Education : Human Values and Yoga Practice II** |
| **Semesters : III & IV** | **Credits : 2**         **CIA : 50 Marks** |

**(Common to all UG Programmes)**

**Course Objective:**

To help the students appreciate the essential complementarily between 'values' and 'skills' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings. To prepare and distribute standardized Yoga teaching and training material with reference to institute health**.**

**Course Outcomes:**

| | |
|---|---|
| **CO1** | To understand the values of Self realization and Harmony |
| **CO2** | To transform as a positive personality and understand the importance of healthy mind |
| **CO3** | To know the ways for eradication of worries. |
| **CO4** | To learn and practice Asanas in day to day life. |
| **CO5** | To understand the benefits of Yogasanas for physical and mental well being. |

**Course Content**                        **Instructional Hours/Week : 1**

| Unit | Description | Chapter |
|---|---|---|
| **I** | **Self-realization and Human Values-**Self-realization and Harmony-Rules and Regulations-Rights and Duties-Good and Obligation-Integrity and Conscience. **Obligation to Family-**Trust and Respect-Codes of Conduct-Citizens Charter-Emotional Intelligence. | |
| | **Instructional Hours** | **6** |
| **II** | **Character Formation Towards Positive Personality**: Truthfulness, Constructivity, Sacrifice, Sincerity, Self Control, Altruism, Tolerance, | |
| | **Instructional Hours** | **6** |
| **III** | **Eradication of worries** - Maintaining youthfulness – Greatness of friendship– Refinement of worries-Neutralization of anger-Intelligent quotient(IQ),Emotional quotient(EQ),Spiritual Quotient (SQ) | |
| | **Instructional Hours** | **6** |
| **IV** | **Standing Posture**: Tadasana, Padahastasana, Virabhadrasana; Sitting posture: Ustrasana, Ardha Matsyendrasana, Paschimottanasana. | |
| | **Instructional Hours** | **6** |
| **V** | **Supine posture**: Sarvangasana, Halasana, Chakrasana. **Prone posture**: Bhujangasana, shalabhasana; Dhanurasana; **Balancing postures**: Vrikshasana, Natarajasana, Utkatasana; Pranayama: Bhastrika, Bhramari, NadiShodhan. | |
| | **Instructional Hours** | **6** |
| | **Total Hours** | **30** |

**Textbook:**

1. **"Value Education II ",** compiled by Curriculum Development cell, Nehru Arts and Science College.

## Tools for Assessment

| 25 marks | 25 marks |
|---|---|
| Comprehensive test in Units I to III for 25 marks during CIA III of Sem. II | Perform 02 Yoga postures for Practical exam to be conducted during the mid of Sem. II |

## Mapping

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | H | L | M | H | H | - | - | - | - | L |
| CO2 | - | - | - | L | M | H | M | H | - | - | - | - | L |
| CO3 | - | - | - | L | M | H | H | H | - | - | - | - | L |
| CO4 | - | - | - | L | L | H | M | H | - | - | - | - | L |
| CO5 | - | - | - | L | L | H | M | H | - | - | - | - | L |

**H-High; M-Medium; L-Low;**

| Course Designed by | Verified by HOD | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title | | |
|-------------|-------|---|---|
| **21U3CAC507** | **Core Paper XIII: Computer Networks** | | |
| **Semester: V** | **Credits - 4** | **CIA:50 Marks** | **ESE:50 Marks** |

**Course Objective:**

To inculcate knowledge on Networking concepts and technologies like wireless, Broadband and Bluetooth**.**

**Course Outcomes (CO):**

| CO1 | Understand about network hardware, software and uses of computer networks |
|-----|--------------------------------------------------------------------------|
| CO2 | Understand Guided Transmission Media, Wireless Transmission, and Communication Satellites |
| CO3 | Understand error detection and correction, elementary data link protocol |
| CO4 | Apply various Transport Protocols and Routing algorithms |
| CO5 | Understand the concept of DNS and Cryptography |

**Offered by: Computer Applications**

**Course Content**                                        **Instructional Hours/Week: 5**

| Unit | Description | Text Book | Chapter |
|------|-------------|-----------|---------|
| **I** | **Uses of computer networks**: Business Applications- Home Applications - Mobile Users - and Social Issues. **Network Hardware**: Personal Area Networks - Local Area Networks - Metropolitan Area Networks - Wide Area Networks, Internetworks. **Network software**: Protocol Hierarchies - Design Issues for the Layers - Connection-Oriented Versus Connectionless Service - Service Primitives - the Relationship of Services to Protocols - **Reference models**: The OSI Reference Model - The TCP/IP Reference Model- A Comparison of the OSI and TCP/IP Reference Models. | 1 | 1 |
| | **Instructional Hours** | | **15** |
| **II** | **Physical Layer** - **Guided Transmission Media**: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics. **Wireless Transmission**: Electromagnetic Spectrum –Radio Transmission – Microwave Transmission – Infrared and Millimeter Waves – Light Waves. **Communication Satellites**: Geostationary - Medium-Earth Orbit - Low Earth-orbit Satellites – Satellites versus Fiber. | 1 | 2 |
| | **Instructional Hours** | | **15** |
| **III** | **Data link Layer:** Services Provided to the Network Layer – Framing- Error Control - Flow Control. **Error detection and Correction:** Error-Correcting Codes - Error-Detecting Codes. **Elementary data link Protocols**: A Utopian Simplex Protocol- A Simplex Stop-and-Wait Protocol for an Error-Free Channel- A Simplex Stop-and-Wait Protocol for a Noisy Channel. **Sliding Window Protocols:** One-Bit sliding window protocol – A protocol using Go-Back-N – A Protocol using Selective Repeat. **Getting started with Cisco Packet Tracer: Introduction to Cisco Packet Tracer, Create a Simple Network, Exploring Networking With cisco Packet tracer.** | 1 | 3 |
| | **Instructional Hours** | | **15** |

| | | | |
|---|---|---|---|
| IV | **Network layer : Routing algorithm**-The Optimality Principle, Shortest Path Algorithm, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast Routing, Multicast Routing, Anycast Routing, Routing for Mobile Hosts, Routing in Ad Hoc Networks, **Transport layer : Elements of transport protocols**-Addressing, Connection Establishment, Connection Release, Error Control and Flow Control, Multiplexing, Crash Recovery **The Internet Transport Protocols UDP** : Introduction to UDP.  TCP- Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, TCP Connection Management Modeling, TCP Sliding Window, TCP Timer Management, TCP Congestion Control. | 1 | 5,6 |
| | **Instructional Hours** | | **15** |
| V | **Application layer :** DNS—The Domain Name System, The DNS Name Space, Domain Resource Records, Name Servers, **Electronic mail** - Architecture and Services, The User Agent, Message Formats, Message Transfer, Final Delivery, **Network Security : Cryptography** - Introduction to Cryptography, Substitution Ciphers, Transposition Ciphers,  One-Time Pads, Two Fundamental Cryptographic Principles. | 1 | 7,8 |
| | **Instructional Hours** | | **15** |
| | **Total Hours** | | **75** |

**Text Book:**
1. Andrew S. Tanenbaum; "Computer Networks", 4th edition, PHI.

**Reference Books:**
1. Achyut Godbole, "Data Communication and Networks",  2007, TMH.
2. Uyless Black, "Computer Networks: Protocols, Standards, and Interfaces", 2nd ed., PHI

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Simulation | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO \ CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO2 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO3 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO4 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO5 | H | H | M | M | M | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HOD | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title | | |
|---|---|---|---|
| **21U3CAC508** | **Core Paper XIV: Object Oriented System and Design** | | |
| **Semester: V** | **Credits:4** | **CIA : 50 Marks** | **ESE : 50 Marks** |

**Course Objective:**

To learn various concepts, tools and techniques that are used to design and implement software systems.

**Course Outcomes:**

| CO1 | Understand the UML and DFD concepts and to differentiate logical and Physical DFD |
|---|---|
| CO2 | Apply Class Relationship concepts for real time applications |
| CO3 | Design Class Diagrams and Interaction Diagrams for Real time applications |
| CO4 | Create Use Case Diagrams, Activity Diagram and State transition Diagram for Real time applications |
| CO5 | Generate Component and Deployment Diagrams for Real time Applications |

**Offered by: Computer Applications**

**Course Content**                    **Instructional Hours / Week: 5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Introduction to UML:** Overview of the UML- Importance of modeling- principles of modeling- object oriented modeling- conceptual model of the UML- Architecture- Software Development Life Cycle. DFD-what is DFD-General Rules for Drawing DFD-Difference Between Logical data flow diagram and Physical data flow diagram. **CASE STUDY:** Student MIS | 1 | 1,2,3 |
| | **Instructional Hours** | | **15** |
| **II** | **Structural Modelling Basic Structural Modelling:** Classes- Relationships- common Mechanisms- and diagrams. Advanced Structural Modelling: Advanced classes- Advanced relationships- Interfaces- Types and Roles- Packages. <br> **Class & Object Diagrams**: Terms and concepts- Construction of a class diagram- Common modelling techniques for Class & Object Diagrams-Interactions- Interaction diagrams <br> **CASE STUDY:** Payroll Processing System | 1 | 4,5,6 |
| | **Instructional Hours** | | **15** |
| **III** | Behavioural Modelling: Use cases- Use case Diagrams- Activity Diagrams. Advanced Behavioural Modelling- state machines-processes and Threads- Time and space- state chart diagrams. <br> **CASE STUDY:** Library Management System | 1 | 7,8,9 |
| | | | **15** |
| **IV** | Behavioural Modelling: Use cases- Use case Diagrams- Activity Diagrams. Advanced Behavioural Modelling- state machines-processes and Threads- Time and space- state chart diagrams. <br> **CASE STUDY:** Library Management System | 1 | 10,11 |
| | **Instructional Hours** | | **15** |
| **V** | Architectural Modelling: Components- Modelling Techniques – Modelling a physical database- Model an adaptable system-Deployment - Component diagrams and Deployment diagrams. <br> **CASE STUDY:** ATM Management System. | 1 | 12 |

| VI | **Contemporary Issues:** Case Tools, UML Diagram, Applications of UML Diagram. Seminar, Workshop, Invited Talks. | | |
|---|---|---|---|
| | | **Instructional Hours** | **15** |
| | | **Total Hours** | **75** |

**Text Book:**

1. Object Oriented System Development using the Unified Modelling Language, Ali Bahrami, McGraw Hill International edition
2. Case Tools Concepts and Applications, Ivan N Bayross, BPB Publications

**Reference Book(s):**

1. Introduction to Object- Oriented Modeling, Martina Seidl, Marion Scholz, Christian Huemer, GertiKappel, Easy Reader 2011

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Application Design | Assignment | Seminar | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO2 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO3 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO4 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO5 | H | H | M | M | M | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| **21U3CAC509** | **Core Paper XV: Computer Graphics and Image Processing** |
| **Semester: V** | **Credits: 3**      **CIA: 30 Marks**      **ESE: 45 Marks** |

**Course Objective:**

To understand the theory, principles, concepts and vocabulary of Computer Graphics and to acquire knowledge on the fundamentals of digital image processing.

**Course Outcomes:**

| CO1 | Examine the fundamental concepts of computer graphics and its framework. |
|---|---|
| CO2 | Understand the different graphics hardware and geometrical transformations. |
| CO3 | Describe the fundamentals of digital image processing. |
| CO4 | Illustrate the Concepts of Image enhancement and segmentation. |
| CO5 | Analyse the available color models and the basics of color image processing. |

**Offered by: BCA Departments**

**Course Content**      **Instructional Hours / Week: 5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Introduction to Computer Graphics:** The Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Classification of Application Development of Hardware and software for computer Graphics, Conceptual Framework for Interactive Graphics, Overview, Scan: Converting Lines, Scan Converting Circles, Scan Converting Ellipses. | 1 | 1 |
| | **Instructional Hours** | | **15** |
| **II** | **Graphics Hardware and Geometrical Transformation**: Hardcopy technologies – Display technologies – Raster scan display system - Video Controller –   Input Devices for operator interaction – Image scanners – Geometrical Transformation – 2D transformation – Composition of 3D transformations. | 1 | 2 |
| | **Instructional Hours** | | **15** |
| **III** | **Digital Image Fundamentals**: **Introduction:** Digital image processing - Examples of fields that use digital image processing - Fundamental steps in digital image processing - Components of image processing system. – Light and the Electromagnetic Spectrum - **Digital Image Fundamentals:** A simple image formation model - image sampling and quantization - Some basic relationships between pixels. | 2 | 1,2 |
| | **Instructional Hours** | | **15** |
| **IV** | **Image Enhancement and Segmentation- Some Basic Intensity Transformation Functions:** Image Negatives – Log Transformations – Gamma Transformations – Piecewise-Linear Transformation Functions. **Fundamentals of Spatial Filtering** – The Mechanics of Spatial Filtering – Spatial Correlation and Convolution. **Fundamentals – Points, Line and Edge Detection:** Detection of Isolated points – Line Detection – Edge Models – Basic Edge Detection. **Thresholding:** Basic Global Thresholding – Optimum Global Thresholding using Otsu's Method – Multiple Thresholds – Variable and Multivariable Thresholding. | **2** | 3,10 |
| | **Instructional Hours** | | **15** |

| V | **Color Image Processing:** Color fundamentals, color models, pseudo color image processing, basics of full–color image processing, color transforms, smoothing and sharpening, color segmentation. | 2 | 6 |
|---|---|---|---|
| | | **Instructional Hours** | 15 |
| | | **Total Hours** | 75 |

**Text Book(s):**
1. James D. Foley, Andries van Dam, Steven K. Feiner and F. Hughes John, 2013, "Computer Graphics Principles and Practice in C" Second Edition Pearson
2. Digital Image Processing, Rafeal C. Gonzalez, Richard E. Woods, Second Edition, Pearson Education/PHI.

**Reference Book(s):**
1. William M. Newman Robert F. Sproull, 2003. "**Principles of Interactive Computer Graphics**" Second Edition Published by TATA Mc GRAW - HILL, ISBN: 0074632930
2. Anil K. Jain, , Fundamentals of Digital Image Processing', Pearson 2002.

**Tools for Assessment (30 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Class Participation | Total |
|---|---|---|---|---|---|---|
| 4 | 4 | 7 | 5 | 5 | 5 | 30 |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title | | |
|---|---|---|---|
| **21U3CAP510** | **Core Paper XVI: Practical in Case Tools** | | |
| **Semester: V** | **Credits: 4** | **CIA: 50   Marks** | **ESE: 50   Marks** |

**Course Objectives:**

1. To enable the students to get better understanding and knowledge in the field of CASE tools.

2. To gain practical knowledge on developing case tools

3. To develop UML diagrams for the real time problems

**Course Outcomes (CO):**

| CO1 | Prepare the Problem Statement and Requirement Specification for the given Problem. |
|---|---|
| CO2 | Create ERD And DFD for the specification using CASE TOOLs. |
| CO3 | Design a Software using USE CASE and activity Diagrams |
| CO4 | Generate Code from the Class diagram using CASE Tools |
| CO5 | Analyze the architecture of the software using the Component and Deployment Diagram |

**Offered by: Computer Applications**

**Course Content**                                         **Instructional Hours / Week: 5**

| Prog. No. | List of Programs |
|---|---|
| For the Following Real time Systems (Any 3) |
| | a)  Payroll Processing System |
| | b)  Student MIS |
| | c)  Library Management System |
| | d)  Hostel Management System |
| | e)  ATM Management System |
| | f)  Hospital Management System |
| | g)  Stock Maintenance System |
| | h)  Online Ticket Reservation System |
| | i)  Platform Assignment System |
| | j)  E-Mail Client Management System |
| 1 | Write the complete problem statement |
| 2 | Write the software requirement specification document |
| 3 | Draw the entity relationship diagram |
| 4 | Design DFD for real time problem |
| 5 | Draw use-case diagrams |
| 6 | Draw the activity diagram for the given application |
| 7 | Construct state chart and sequence diagram for use-case |
| 8 | Assign objects in sequence diagram to classes and generate the class diagram and convert into JAVA/VB CODE |
| 9 | Draw the Component Level Diagram |
| 10 | Draw the Deployment Diagram |
| | **Total Hours          75** |

## Tools for Assessment (50 Marks)

| Problem Solving | Code Debugging | Mini Project | Test 1 | Test 2 | Observation Note Book | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 8 | 10 | 10 | 6 | 50 |

## Mapping

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| 21U4CAZ503 | Skill Based Paper III: Practical in Internet of Things | | |
| Semester: V | Credits: 3 | CIA: 30 Marks | ESE:45 Marks |

**Course Objective:**

On the successful completion of the course the students will able to design IoT applications

**Course Outcomes (CO)**

| CO1 | Familiar with Arduino board working |
|---|---|
| CO2 | Implement the design of digital meter |
| CO3 | Interfacing with various sensors |
| CO4 | Design with Tinkercad |
| CO5 | Implementing IoT applications |

**Offered by: Electronics**

**Course Content**                                      **Instructional Hours / Week:4**

| S.No. | Experiments |
|---|---|
| | **Internet of Things Practical**<br>(Any 8 Experiments) |
| 1. | Demonstrate the working of Arduino |
| 2. | Blinking LED |
| 3. | Design of digital dc voltmeter |
| 4. | Measure the air humidity using sensor |
| 5. | Measure the temperature using sensor |
| 6. | Simulate motor control on Tinkercad |
| 7. | Measure the distance of an object using sensor |
| 8. | Smart Home Automation system |
| 9. | Sense the available network |
| 10. | Sense a finger when it is placed on board |
| | **Total Hours: 60** |

## Tools for Assessment (30 Marks)

| Logical Thinking | Program Execution | Problem Solving | Test I | Test II | Observation | Total |
|---|---|---|---|---|---|---|
| 5 | 5 | 5 | 6 | 6 | 3 | 30 |

## Mapping

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low.**

| Prepared by | Verified by HOD | Checked by | Approved by |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | | |
|---|---|---|---|
| **21U3CKC609** | **Core Paper XVII: Data Mining** | | |
| **Semester: VI** | **Credits: 4** | **CIA: 50 Marks** | **ESE: 50 Marks** |

(Common to B. Sc. IT and BCA)

## Course Objective:

To enable the students to explore data using data mining techniques to solve the business problems.

## Course Outcomes:

| | |
|---|---|
| **CO1** | Know basic concept of Data Mining and its Association Rules |
| **CO2** | Understand the different types of Clustering |
| **CO3** | Apply the learnt method in splitting the data and creating Decision Tree |
| **CO4** | Analyse various type of Mining like Web Mining and Text Mining |
| **CO5** | Assess knowledge of What, When and Where the data applied |

## Offered by: Information Technology

**Course Content**                    **Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Data Mining:** Introduction to Data Mining – Data Mining Definition – KDD Vs Data Mining – DBMS Vs Data Mining – Data Mining Techniques – Data Mining Application Areas. **Association Rules**: Association Rules overview - Methods to Discover Association rules – A-Priori Algorithm – Partition Algorithm – Pincer-Search Algorithm. | 1 | 3, 4 |
| | **Instructional Hours** | | **18** |
| **II** | **Clustering Techniques:** Introduction - Clustering Paradigms – Partitioning Algorithm – k-means, k-Medoid Algorithms – CLARA – CLARANS – Hierarchical Clustering – DBSCAN – BIRCH – CURE. | 1 | 5 |
| | **Instructional Hours** | | **18** |
| **III** | Decision Tree – Decision Tree Overview – Tree Construction Principle – Best Split – Splitting Criteria – Decision Tree Construction – CART – ID3 – CHAID – Decision Tree Construction with Pre-sorting. | 1 | 6 |
| | **Instructional Hours** | | **18** |
| **IV** | **Web Mining:** Web Content Mining – Web Structure Mining – Web Usage Mining. **Text Mining:** Unstructured Text - Episode Rule Discovery for Texts – Hierarchy of Categories – Text Clustering. | 1 | 8 |
| | **Instructional Hours** | | **18** |
| **V** | **Temporal Data Mining**: Introduction – Temporal Association Rule – Sequence Mining – GSP Algorithm. **Spatial Mining**: Spatial Mining Tasks – Spatial Clustering – Spatial Trends. | 1 | 9 |
| **VI** | **Contemporary Issues:**<br>    o  Workshop on MATLAB / WEKA Tool<br>    o  Seminar on Web or Text Mining<br>    o  Guest Lecture on Data Mining Algorithms | | |
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Book(s):**
1. Data Mining Techniques by Arun K Purari , Published by University Press India Private Limited.

**Reference Book(s):**
1. Insight into Data Mining Theory and Practice by Soman, Diwakar and Ajay, Published by Prentice Hall of India Private India.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Class Participation | Assignment | Seminar | Total |
|-------|--------|---------|---------------------|------------|---------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO2 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO3 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO4 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO5 | H | H | M | M | M | L | M | H | H | H | H | H | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title |
|---|---|
| **21U3CAV612** | **Project and Viva-Voce** |

| **Semester: VI** | **Credits: 4** | **CIA : 50  Marks** | **ESE: 50 Marks** |
|---|---|---|---|

**Course Objective:**

　　　　To give project based learning which makes the students to apply practically what they learned.

**Course Outcomes (CO):**

| **CO1** | Remember the fundamental concepts of algorithm and designs |
|---|---|
| **CO2** | Understand the optimal methods and Software Engineering concepts to be applied |
| **CO3** | Apply the knowledge and what they learned |
| **CO4** | Analyze the Economical and Technical feasibility |
| **CO5** | Develop software based applications and Deployment of software |

**Offered by: Computer Applications**

**Course Content**　　　　　　　　　　　　　　**Instructional Hours/Week: 6**

| **Project Work and Viva-Voce** |
|---|
| **Project Guidelines**<br><br>Project shall be Application / System Oriented/ Web enabled online applications<br><br>Individual project is permissible. There should be no team project.<br><br>Report should be in the following sequence<br><br>　　■　Declaration<br>　　■　Certificate from the company/organization<br>　　■　Bonafide Certificate<br>Guidelines to prepare documentation:<br><br>　　■　The cover should be in the silver gray colour and hard binding<br>　　■　Font type　　　　: Times New Roman<br>　　■　Font size　　　　: 12<br>　　■　Sub heading size　:14<br>　　■　Heading size　　　:16<br>　　■　Margin　　　　　: top,bottom,right-2.5 cm, left -3 cm<br>　　■　Line spacing between two lines - 1.5<br>　　■　Every paragraph should start with one tab space. |

Sample Templates

Title of the Project

A project report submitted to the Bharathiar University in the partial fulfillment

of the requirements for the award of the degree of

BACHELOR OF COMPUTER APPLICATIONS

Submitted by

Name of the Student

(Reg. No)

Under the Guidance of

Guide Name (Designation)



NEHRU ARTS AND SCIENCE COLLEGE

(Autonomous)

(Reaccredited by NAAC with "A" Grade, ISO 9001-2008 & ISO 14001 : 2004 Certified)

RECOGNIZED BY UGC & AFFILIATED TO BHARATHIAR UNIVERSITY

"NEHRU GARDENS", T. M. PALAYAM, COIMBATORE – 641 105.

Month & year

TABLE OF CONTENTS

Declaration

I, (*Student Name , Reg.No*) hereby declare that the project entitled ( *Title Of The Project*) submitted to Bharathiar University in partial fulfillment for the award of the Bachelor Degree of Computer Applications is an independent project report done by me during the project duration of the period of study in Nehru Arts and Science College, Coimbatore (Recognized by UGC &Affiliated to Bharathiar University)under the guidance of (*Name Of The Guide*) during the academic year 2021-22.

PLACE:                                                                                    Signature of the student
DATE:

# DEPARTMENT OF COMPUTER APPLICATIONS

## NEHRU ARTS AND SCIENCE COLLEGE

(Reaccredited by NAAC with "A" Grade, ISO 9001-2008 & ISO 14001: 2004 Certified)

RECOGNIZED BY UGC & AFFILIATED TO BHARATHIAR UNIVERSITY

"NEHRU GARDENS", T. M. PALAYAM, COIMBATORE – 641 105.



## CERTIFICATE

This is to certify that the project report entitled (*Title Of The Project*), is a bonafied work done by (*Student Name, Reg. No*) in partial fulfillment of the requirement of the award of the degree of Bachelor of Computer Applications, Bharathiar University, Coimbatore during the academic year (Academic Year).

Internal Guide                                   Head of the Department

Certify that we examined the Candidate in the Project Work / Viva-Voce Examination held at NEHRU ARTS AND SCIENCE COLLEGE on _____

Internal Examiner                                External Examiner

**Total Hours: 90**

**Tools for Assessment (50 Marks)**

| Review I | Review II | Review III | Document Preparation | Total |
|:---:|:---:|:---:|:---:|:---:|
| 10 | 10 | 10 | 20 | 50 |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HOD | Checked by | Approved by |
|:---:|:---:|:---:|:---:|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| 21U4CAZ604 | Skill Based Paper IV: Practical in R Programming |
| Semester: VI | Credits - 3      CIA: 30 Marks      ESE: 45 Marks |

**Course Objective:**

To enable the students to gain an in-depth understanding of data structure used in R and learn to import/export data using R.

**Course Outcomes (CO):**

| CO1 | Remember various data types, conditional and looping statements |
|---|---|
| CO2 | Understand about R-studio, workspace setup and the various R packages |
| CO3 | Apply data Structures: Vectors, Lists, Matrices and Arrays and Factors and Data Frame in R language and manipulate |
| CO4 | Analyze the feasible logics |
| CO5 | Evaluate the optimal solution of the problem |

**Offered by: Computer Applications**

**Course Content**                                    **Instructional Hours/Week: 6**

| S. No | List of Practical |
|---|---|
| 1 | Write a Program to generate Random Number using Standard Deviation |
| 2 | Write a Program to find Minimum and Maximum number from given input. |
| 3 | Write a Program to check whether the given number is Armstrong Number or not. |
| 4 | Write a Program to Convert Decimal number into Binary number using Recursion. |
| 5 | Write a Program to find the sum of 'n' natural numbers |
| 6 | Write a Program to create a list and to append, modify and delete the elements in the list. |
| 7 | Write a Program to create a matrix addition and subtraction. |
| 8 | Write a Program to check whether the given number is palindrome or not using function. |
| 9 | Write a Program to create the Data Frame and extract the value. |
| 10 | Write a Program to Find Sum, Mean and Product of Vector |
| 11 | Write a Program to Sample from a Population |
| 12 | Write a Program to Sort a Vector |
|  | **Total Hours**      **90** |

**Tools for Assessment (30 Marks)**

| Logical Thinking | Program Execution | Debugging | Test I | Test II | Observation | Total |
|---|---|---|---|---|---|---|
| 5 | 5 | 5 | 6 | 6 | 3 | 30 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HOD | Checked by | Approved by |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title |
|---|---|
| **21U3CKE501** | **Discipline Specific**<br>**Elective Paper I: Blockchain Technology** |
| **Semester: V** | **Credits: 4** | **CIA : 50  Marks** | **ESE:50 Marks** |

(Common to B. Sc. CS /  DCFS / IT / BCA)

**Course Objective:**

To understand the Block chain technology and explain about the Block chain technology Techniques.

**Course Outcomes:**

| CO1 | Understand emerging abstract models for Block chain Technology. |
|---|---|
| CO2 | Identify major research challenges and technical gaps existing between theory and practice in crypto currency domain. |
| CO3 | Understanding the function of Blockchain as a method of securing distributed ledgers, how consensus on their contents is achieved, and the new applications that they enable. |
| CO4 | Apply hyper ledger Fabric and Etheric platform to implement the Block chain Application. |
| CO5 | Understand the role of Block chain technology |

**Offered by:** Computer Science

**Course Content**                                    **Instructional Hours/Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **INTRODUCTION TO BLOCKCHAIN**<br>Block chain- Public Ledgers, Blockchain as Public Ledgers - Bitcoin, Blockchain 2.0, Smart Contracts,Block in a Blockchain, Transactions-Distributed Consensus, The Chain and the Longest Chain -Cryptocurrency to Blockchain 2.0 - Permissioned Model of Block chain, Cryptographic -Hash Function, Properties of a hash function-Hash pointer and Merkle tree | 1 | 1 |
| | **Instructional Hours** | | **18** |
| **II** | **BITCOIN AND CRYPTO CURRENCY**<br>A basic crypto currency, Creation of coins, Payments and double spending, FORTH - the precursor for Bitcoin scripting, Bitcoin Scripts , Bitcoin P2P Network, Transaction in Bitcoin Network, Block Mining, Block propagation and block relay, Consensus introduction, Distributed consensus in open environments-Consensus in a Bitcoin network | 1 | 2 |
| | **Instructional Hours** | | **18** |
| **III** | **BITCOIN CONSENSUS**<br>Bitcoin Consensus, Proof of Work (PoW)- Hashcash PoW , Bitcoin PoW, Attacks on PoW ,monopoly problem- Proof of Stake- Proof of Burn - Proof of Elapsed Time - Bitcoin Miner, Mining Difficulty, Mining Pool-Permissioned model and use cases, Design issues for Permissioned Blockchains, Execute contracts-Consensus models for permissioned block chain-Distributed consensus in closed environment Paxos | 1 | 3 |
| | **Instructional Hours** | | **18** |
| **IV** | **DISTRIBUTED CONSENSUS**<br>RAFT Consensus-Byzantine general problem, Byzantine fault tolerant system-Agreement Protocol, Lamport- Shostak-Pease BFT Algorithm-BFT over Asynchronous systems, Practical Byzantine Fault Tolerance | 1 | 5 |
| | **Instructional Hours** | | **18** |

| | | | | |
|---|---|---|---|---|
| **V** | **BLOCK CHAIN APPLICATIONS**<br>Internet of Things-Medical Record Management System-Blockchain in Government and Blockchain Security-Blockchain Use Cases –Finance | | 1 | 7 |
| | **Instructional Hours** | | | **18** |
| | **Total Hours** | | | **90** |

**Text Book(s):**
1. Bashir, Imran **, Mastering Blockchain: Deeper insights into decentralization, cryptography, Bitcoin, and popular Blockchain frameworks**,2017.
   > **Unit I:** Sections: 1.1 to 1.6 (Chapter 1)
   > **Unit II:** Sections: 2.1 to 2.5 (Chapter 2)
   > **Unit III:** Sections: 3.1 to 3.8 (Chapter 3)
   > **Unit IV:** Sections: 5.1 to 5.4, 5.8 (Chapter 5)
   > **Unit V:** Sections: 7.1 to 7.5 (Chapter 7)

**Reference Book(s):**
1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. **Bitcoin and cryptocurrency technologies: a comprehensive introduction**. Princeton University
   Press, 2016.
2. Joseph Bonneau et al, **SoK: Research perspectives and challenges for Bitcoin and cryptocurrency**, IEEE Symposium on security and Privacy, 2015.

## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| **21U3CKE502** | **Discipline Specific**<br>**Elective Paper I: Next Generation Networks** |
| **Semester: V** | **Credits: 4** | **CIA: 50 Marks** | **ESE: 50 Marks** |

<p align="center">(Common to B. Sc. CS / DCFS / IT / BCA)</p>

**Course Objective:**

      To learn the technical, economic and service advantages of next generation networks. Analyse the evolution of technologies of 4G and beyond, to explore the NGN framework catering services of end user with QoS provisioning.

**Course Outcomes:**

| CO1 | Describe the issues and challenges of wireless domain in future generation network design |
|---|---|
| CO2 | Explain the evolution of technologies of 4G and beyond |
| CO3 | Explore the LTE concepts and technologies |
| CO4 | Outline the process of integrating SDN with LTE |
| CO5 | Explain the NGN architectures, management and standardizations |

**Offered by: Computer Applications**

**Course Content**             **Instructional Hours/Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **INTRODUCTION:** Evolution of public mobile services -motivations for IP based services, Wireless IP network architecture –3GPP packet data network architecture. Introduction to next generation networks - Changes, Opportunities and Challenges, Technologies, Next Generation Society, future Trends. | 2 | 1,2 |
| | **Instructional Hours** | | **18** |
| **II** | **4G AND BEYOND**: Introduction to LTE-A –Requirements and Challenges, network architectures -mobility management, resource management, services, channel -logical and transport channel mapping, downlink/uplink data transfer, MAC control element, PDU packet formats, scheduling services, random access procedure. | 1<br>2 | 3<br>3,4 |
| | **Instructional Hours** | | **18** |
| **III** | **SDMN-LTE INTEGRATION:** SDN paradigm and applications, SDN for wireless-challenges, Leveraging SDN for 5G network Ubiquitous connectivity-mobile cloud-cooperative cellular network-restructuring mobile networks to SDN-SDN/LTE integration benefits. | 1 | 4,5 |
| | **Instructional Hours** | | **18** |
| **IV** | **NGN ARCHITECTURE**:Evolution towards NGN-Technology requirements, NGN functional architecture- Transport stratum, service stratum, service/ content layer and customer terminal equipment function. NGN entities, Network and Service evolution -fixed, mobile, cable and internet evolution towards NGN. | 1<br>2 | 4<br>6 |
| | **Instructional Hours** | | **18** |
| **V** | **NGN MANAGEMENT AND STANDARDIZATION**: NGN requirements on Management-Customer, third party, Configuration, Accounting, performance, device and information management. Service and control management- End-toEndQoS and security. ITU and GSI-NGN releases, ETSI-NGN concept and releases, NGMN alliance and NGMN. | 1 | 7,8,9 |
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Books:**
1. Jingming Li Salina, Pascal Salina "**Next Generation Networks-perspectives and potentials"** Wiley, January 2008.
2. Thomas Plavyk, ―**Next generation Telecommunication Networks, Services and Management**, Wiley & IEEE Press Publications, 2010.

**Reference Books:**
1. MadhusangaLiyanage, Andrei Gurtov, Mika Ylianttila, "**Software Defined Mobile Networks beyond LTE Network Architecture**", Wiley, June 2015.

## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Class Participation | Total |
|-------|--------|---------|------------|---------|---------------------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| PO\CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO2 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO3 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO4 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO5 | H | H | M | M | M | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title |
|---|---|
| **21U3CKE503** | **Discipline Specific**<br>**Elective Paper I: Internet of Things** |
| **Semester: V** | **Credits: 4** \| **CIA: 50 Marks** \| **ESE: 50 Marks** |

**(Common to B. Sc. CS / DCFS / IT / BCA)**

**Course Objective:**

To understand the Data and Knowledge Management and use of Devices in IoT Technology, Understand State of the Art – IoT Architecture and Real World IoT Design.

**Course Outcomes:**

| CO1 | Understand the vision of IoT from a global context. |
|---|---|
| **CO2** | Understand the Market perspective of IoT. |
| **CO3** | Understand Use of Devices, Gateways and Data Management in IoT. |
| **CO4** | Build state of the art architecture in IoT. |
| **CO5** | Application of IoT in Industrial and Commercial Building Automation and Real-World Design Constraints. |

**Offered by: Electronics and Communication Systems**

**Course Content**                                    **Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **M2M to IoT**-The Vision-Introduction, From M2M to IoT, M2M towards IoT-the global context, A use case example, Differing Characteristics. | 1 | 2 |
|  | **Instructional Hours** | | **18** |
| **II** | **M2M to IoT – A Market Perspective**– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies.<br>**M2M to IoT-An Architectural Overview**– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations. | 1 | 3-4 |
|  | **Instructional Hours** | | **18** |
| **III** | **M2M and IoT Technology Fundamentals-** Devices and gateways, Local and wide area networking, Data management. | 1 | 5 |
|  | **Instructional Hours** | | **18** |
| **IV** | **Overview of Industry 4.0**<br>Introduction - Evolution of Industry 4.0 - Environmental impacts - Industrial Internet - Applications of Industry4.0 - Prerequisites of IIoT - Basics of CPS - CPS and IIoT | 2 | 2 |
|  | **Instructional Hours** | | **18** |
| **V** | **IIoT**<br>Introduction - IIC - Industrial Internet Systems : Design , Impact, Benefits - Industrial sensing - Industrial Processes : Features - Industrial plant - Viewpoint - Digital Enterprise - Applications | 2 | 4 |
|  | **Instructional Hours** | | **18** |
|  | **Total Hours** | | **90** |

**Text Books:**

1. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, StamatisKarnouskos, David Boyle, **"From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence",** Academic Press, 2014.
2. S. Misra, C. Roy, and A. Mukherjee, **Introduction to Industrial Internet of Things and Industry 4.0** CRC Press, 2020

> Unit I : Text Book 1, Chapter 2
> Unit II : Text Book 1, Chapter 3,4
> Unit III: Text Book 1, Chapter 5
> Unit IV: Text Book 2, Chapter 2
> Unit V : Text Book 2, Chapter 4

**Reference Books:**

1.Vijay Madisetti and ArshdeepBahga, **"Internet of Things (A Hands-on-Approach)",** VPT, 2014.
2.Francis daCosta, **"Rethinking the Internet of Things: A Scalable Approach to Connecting Everything",** Apress Publications, 2013

### Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Group Project | Total |
|-------|--------|---------|------------|---------|---------------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

### Mapping

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| **CO1** | H | H | L | M | H | L | M | H | H | H | H | M | M |
| **CO2** | H | H | L | M | H | L | M | H | H | H | H | M | M |
| **CO3** | H | H | L | M | H | L | M | H | H | H | H | H | H |
| **CO4** | H | H | L | M | H | L | M | H | H | H | H | H | H |
| **CO5** | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**.

| Course Designed by | Verified by HOD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title |
|---|---|
| **21U3CKE504** | **Discipline Specific Elective Paper I:  Big Data Analytics** |
| **Semester: V** | **Credits: 4**    **CIA:50 Marks**    **ESE: 50 Marks** |

**(Common to B. Sc. CS / AIML / DCFS / IT / BCA)**

**Course Objective:**

To provide an overview of an exciting growing field of big data analytics, analyse big data like Hadoop, NoSQL Map-Reduce and learn fundamental techniques and principles in achieving big data analytics.

**Course Outcomes:**

| CO1 | Know about the big data analytics |
|---|---|
| **CO2** | Tools in big data analytics using Hadoop |
| **CO3** | Data model in big data analytics using NoSql |
| **CO4** | Understanding about Map Reduce Programming |
| **CO5** | Gain more knowledge about Hadoop streaming with R |

**Offered by: Information Technology**

**Course Content**                    **Instructional Hours/Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | **BIG DATA**: Introduction to Big Data, Big Data characteristics, types of Big Data, Traditional Vs. Big Data business approach, Bigdata Challenges, Case Study of Big Data Solutions. | 1 | 1 |
| | **Instructional Hours** | | **18** |
| II | **HADOOP:** Introduction – Why Hadoop – Why not RDBMS – RDBMS versus Hadoop – History of Hadoop – Hadoop Overview – Hadoop Distributed File System (HDFS) – Processing Data with Hadoop – Managing Resources and Applications with Hadoop YARN – Interacting with Hadoop Ecosystem | 2 | 2 |
| | **Instructional Hours** | | **18** |
| III | **NoSQL DATA MODEL:** Introduction to NoSQL – NoSQL Business Drivers – NoSQL Data Architectural Patterns – Variations of NoSQL Architectural Patterns – Using NoSQL to Manage Big data – Case study of NoSQL | 1 | 3 |
| | **Instructional Hours** | | **18** |
| IV | **MAP REDUCE Programming:** Introduction to MapReduce – Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression | 2 | 4 |
| | **Instructional Hours** | | **18** |
| V | **Hadoop streaming with R:** Understanding the basics of Hadoop streaming – How to run Hadoop streaming with R – Understanding a MapReduce application – Understanding how to code and run a Map-Reduce application – how to explore the output of Map Reduce application | 3 | 4 |
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Books:**
1. RadhaShankarmani, M Vijayalakshmi, **"Big Data Analytics",**WileyPublications,first Edition 2016
2. Seema Acharya, SubhashiniChellappan**,** "**Big Data and Analytics",** Wiley Publication, first edition. Reprint in 2016
3. VigneshPrajapati, **"Data analytics with R and Hadoop"** , Copyright © 2013, Packt Publishing.

**Reference Books:**
1. Michael Minelli, Michelle Chambers, and AmbigaDhiraj, **"Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses"**, Wiley, 2013
2. Bill Franks, Taming,**"The Big Data Tidal Wave: Finding Opportunities In Huge Data Streams With Advanced Analytics"**, Wiley

## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Class Participation | Seminar | Assignment | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title | | |
|---|---|---|---|
| **21U3CKE605** | **Discipline Specific** **Elective Paper II: Software Quality Assurance** | | |
| **Semester: VI** | **Credits: 4** | **CIA:50 Marks** | **ESE: 50 Marks** |

**(Common to B. Sc. CS / DCFS / IT / BCA)**

**Course Objective:**

To describe Quality Assurance, understand quality components and apply the quality models.

**Course Outcomes:**

| CO1 | Knowledge about the concept, factors, of Quality Assurance |
|---|---|
| CO2 | Understand various components of Quality Assurance |
| CO3 | Analyze Testing process in Quality Assurance |
| CO4 | Analyze various Software Quality metrics |
| CO5 | Interpret the various on Standards for Software Quality. |

**Offered by:** Computer Science, Computer Technology, Information Technology and BCA Departments

**Course Content** **Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | **Software Quality:** Introduction - Software error, faults and failures- Classification of the causes of software errors-Software Quality Definition and objectives – software quality assurance and software engineering. **Software Quality factors:** Need for comprehensive software quality requirements – classification of software requirements into software quality factors – product operation software quality factors- product revision software quality factors – product transition software quality factors. | 1 | 2,3 |
| | **Instructional Hours** | | **18** |
| II | **Components of SQA system :** SQA system and architecture – Pre-project components – software project life cycle components – Infrastructure components for error prevention and improvement – Management SQA components – SQA standards, system certification and assessment components – Organizing for SQA – the human components. | 1 | 4 |
| | **Instructional Hours** | | **18** |
| III | **Software testing strategies:** Definition and objectives- software testing strategies – software test classifications – White box testing – Black box testing. **Software testing implementation:** Testing process – Test-case Design – Automated testing – Alpha – beta site testing programs. | 1 | 9,10 |
| | **Instructional Hours** | | **18** |
| IV | **Software Quality metrics:** Objectives of quality measurement – Classification of software quality metrics – Process metrics- Product metrics- Implementation of Software Quality metrics – Cost of Software Quality metrics-Classical model of Software Quality. | 1 | 21,22 |
| | **Instructional Hours** | | **18** |
| V | **Quality management standards:** Scope –Main standards of software quality management - ISO 9000-3 – certification according to ISO 9000-3 standard – Capability Maturity model principles, structure and processes area – Bootstrap methodology. | 1 2 | 23 4 |
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Books:**

1. Daniel Galin, **"Software Quality Assurance From Theory to Implementation"**, Pearson education Ltd.,2004.
2. Claude Y. Laporte and Alain April, **"Software Quality Assurance"**, IEEE Press wiley, 2018.

**Reference Books:**
1. Stephen H. Kan, **"Metrics and Models in Software Quality Engineering"**, 2nd Edition, Pearson, 2003.
2. Kshirasagar Naik and Priyadarshi Tripathy (Eds), **"Software Testing and Quality Assurance: Theory and Practice"**, John Wiley, 2008

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Class Participation | Assignment | Seminar | Total |
|-------|--------|---------|---------------------|------------|---------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO\CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO2 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO3 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO4 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO5 | H | H | M | M | M | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low.**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
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|  |  |  |  |

| Course Code | Title |
|---|---|
| **21U3CKE606** | **Discipline Specific**<br>**Elective Paper II: Information Security** |
| **Semester: VI** | **Credits: 4** | **CIA: 50  Marks** | **ESE: 50    Marks** |

**(Common to B. Sc. CS / AIML /  DCFS / IT / BCA)**

**Course Objective:**

 To enable the students to understand various aspects of Information Security in the local and Global scenarios.

**Course Outcomes:**

| CO1 | Understand the basics of Information Security |
|---|---|
| CO2 | Identify the legal, ethical and professional issues in Information Security |
| CO3 | Understand the Risk Management Strategy |
| CO4 | Assess the technologies which are essential to provide Information Security |
| CO5 | Understand the Information Security Maintenance model. |

**Offered by:** Computer Applications

**Course Content**　　　　　　　　　　　　　　　　　**Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Introduction to Information security:** History - What is Information Security - Critical Characteristics of Information, NSTISSC Security Model- Components of an Information System, Securing the Components-Balancing Security and Access-The SDLC-The Security SDLC. | 1 | 1 |
| | **Instructional Hours** | | **18** |
| **II** | **Need for Security:** Introduction- Business Needs-Threats-Attacks. | 1 | 2 |
| | **Legal, Ethical and Professional Issues:** Introduction-Laws and ethics-types of law-international laws and legal bodies-Ethics and information security. | 1 | 3 |
| | **Instructional Hours** | | **18** |
| **III** | **Risk Management:** Introduction-overview-Identifying and Assessing Risk-Assessing- Control strategies- selecting strategy. | 1 | 4 |
| | **Instructional Hours** | | **18** |
| **IV** | **Planning for Security:**  Introduction-Information Security Policy-Blueprint for Security-Security education-training and awareness-  Continuity strategies, Risk appetite, Management discussion points, documenting results. | 1 | 5 |
| | **Instructional Hours** | | **18** |
| **V** | **Implementing Information Security: Introduction**- Project management for information security-Technical and non-technical aspects of implementation. | 1 | 10 |
| | **Information Security Maintenance:** Introduction- Security management models-Maintenance model. | 1 | 12 |
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Books:**

1. Michael E. Whitman and Herbert J. Mattord, **"Principles of Information Security",** Second Edition, Thomson Publishers.

**Reference Books:**

1. Surya Prakash Tripathi and Ritendra Goel, **"Introduction to Information Security and Cyber Laws",** 2014, Dream Tech Press.
2. V.K. Pachghare, **"Cryptography and Information Security"**, 2nd Revised edition, Prentice-Hall of India Pvt.Ltd.
3. Mark S. Merkow, **"Information Security: Principles and Practices"**, Second Edition, Pearson Education.

## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Class Participation | Assignment | Seminar | Total |
|-------|--------|---------|---------------------|------------|---------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| PO\CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO2 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO3 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO4 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO5 | H | H | M | M | M | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low.**

| Course Designed by | Verified by | Checked by | Approved by |
|--------------------|-------------|------------|-------------|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title |
|---|---|
| **21U3CKE607** | **Discipline Specific**<br>**Elective Paper II: Cloud Computing** |
| **Semester: VI** | **Credits: 4** | **CIA: 50 Marks** | **ESE:50 Marks** |

<div align="center">(Common to B. Sc. CS / DS / DCFS / IT / BCA)</div>

**Course Objectives:**
- To make the students to understand the Cloud Computing and types, cloud architecture, identify the applications of cloud computing abstraction & virtualization in real-time.

**Course Outcomes:**

| CO1 | Understand the basics of Cloud Computing |
|---|---|
| CO2 | Understand the architecture and services of cloud |
| CO3 | Identify the importance of abstraction and virtualization |
| CO4 | Apply the cloud computing for personal and business usage |
| CO5 | Gain knowledge in cloud security |

**Offered by:** Information Technology

**Course Content**

**Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Defining Cloud Computing:** Defining Cloud Computing - Cloud Types - Examining the Characteristics of Cloud Computing - Disadvantages of cloud computing - Assessing the Role of Open Standards. | 1 | 1 |
| | **Assessing the Value Proposition:** Measuring the Cloud's Value: The laws of cloudonomics - Cloud computing obstacles - Behavioral factors relating to cloud adoption. | | 2 |
| | **Instructional Hours** | | **18** |
| **II** | **Understanding Cloud Architecture:** Exploring the Cloud Computing Stack - Connecting to the Cloud. | 1 | 3 |
| | **Understanding Services and Applications by Type:** Defining Infrastructure as a Service (IaaS) - Defining Platform as a Service (PaaS) - Defining Software as a Service (SaaS) - Defining Identity as a Service (IDaaS) - Defining Compliance as a Service (CaaS). | | 4 |
| | **Instructional Hours** | | **18** |
| **III** | **Understanding Abstraction and Virtualization:** Using Virtualization Technologies - Load Balancing and Virtualization - Understanding Hypervisors - Understanding Machine Imaging - Porting Applications. | 1 | 5 |
| | **Exploring Platform as a Service:** Defining Services - Using PaaS Application Frameworks. | | 7 |
| | **Instructional Hours** | | **18** |
| **IV** | **Using Google Web Services:** Exploring Google Applications - Surveying the Google Application Portfolio - Exploring the Google Toolkit - Working with the Google App Engine. | 1 | 8 |
| | **Using Amazon Web Services:** Understanding Amazon Web Services - Amazon Web Service Components and Services - Working with the Elastic Compute Cloud (EC2) - Working with Amazon Storage Systems - Understanding Amazon Database Services. | | 9 |
| | **Instructional Hours** | | **18** |

| V | **Using Microsoft:** Cloud Services - Exploring Microsoft Cloud Services - Defining the Windows Azure Platform - Using Windows Live. | 1 | 10 |
|---|---|---|---|
| | **Understanding Cloud:** Security - Securing the Cloud - Securing Data - Establishing Identity and Presence**.** | | 12 |
| | | Instructional Hours | 18 |
| | | Total Hours | 90 |

**Text Book:**
1. Barrie Sosinsky, **"Cloud Computing Bible"**, Wiley Publishing ,Inc., 2011.

**Reference Book(s):**
1. Ray J Rafaels, **"Cloud Computing : From Beginning  to End"**, 2015.
2. Arshdeep, Bahga and Vijai Madisetti, **"Cloud Computing: A Hands-on Approach"**, 2014.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Class Participation | Seminar | Assignment | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | M | M | M | L | M | H | H | H | H | M | M |
| **CO2** | H | H | M | M | M | L | M | H | H | H | H | M | M |
| **CO3** | H | H | M | M | M | L | M | H | H | H | H | H | H |
| **CO4** | H | H | M | M | M | L | M | H | H | H | H | H | H |
| **CO5** | H | H | M | M | M | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HOD | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| **21U3CKE608** | **Discipline Specific Elective Paper II: Cyber Security** |
| **Semester: VI** | **Credits: 4** | **CIA: 50 Marks** | **ESE: 50 Marks** |

**(Common to B. Sc. CS / AIML / IT / DS / BCA)**

**Course Objectives:**

To make the students to understand Cryptography, Cyber crime and its significance in current scenario of IT and information security.

**Course Outcomes:**

| CO1 | Remember the information and various representation |
|---|---|
| CO2 | Understand the concept of computer networks and overview of internet |
| CO3 | Understand the information storage, data communication and data modulation techniques |
| CO4 | Understand the knowledge about the Cryptography, Cyber Crime and Information Security |
| CO5 | Understand the importance of Information Security Framework |

**Offered by:** Artificial Intelligence and Machine Learning

**Course Content**      **Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Information and its Representation:** What is information – Quality - of Information - Value of Information - Information Processing - Information Processing cycle in computers - information - Representation and codes - Number Representation - Binary - Representation of Positive integers - Signed Binary Integers - Positive Binary Fractions - signed Binary Fractions - Representing Fractions in Binary - Representation of Alphanumeric - Data - Current Trends in Information Technology – semiconductor - Technology - Information storage - Networking - Applications of - IT - IT Applications in Business - Modeling and simulation | 1 | 1 |
| | **Instructional Hours** | | 18 |
| **II** | **Computer Networks and Internet:** An overview - What is – computer Network – Basic networking components - what is Internet - Internet Protocols - Internet protocol types - OSI Reference versus TCP/IP Model - OSI model layers - TCP/IP | 1 | 2 |
| | **Instructional Hours** | | 18 |
| **III** | **Information storage and communication:** Information storage - purpose of storage - Types of storage Devices - File organization - Internal file structure - External file structure and file extension - Data communication - an overview - what is data communication - signals - Basic - Data Communication Model - Modulation Techniques. | 1 | 3 |
| | **Instructional Hours** | | 18 |
| **IV** | **Cryptography Systems**: Introduction-Cryptography Systems Types- Symmetric Cryptography - Asymmetic or Public Key, Cryptography-Hash Functions-Why three Encryption Techniques? – Public key Algorithms – RSA Public Key Algorithm – Digital Signature – Diffie – Hellman - ElGamal- EDCSA-XTR. **Cyber Law and Ethics**: Introduction to cybercrime - Prevention - preventive steps for Individuals - preventive steps for organizations and government - How to protect the computer against threats. | 1 | 5 & 6 |
| | **Instructional Hours** | | 18 |

| V | Information security Framework - Information security and privacy - security Framework - Information systems security Framework – Framework for Network security access. Access control Techniques-Computer Security and Access Control-Access control Techniques-Biometric Authentication-Authentication Tokens-Token types and usage-Digital signature-Embodiments and vendors-Related Authentication Technologies. | 1 | 8 & 9 |
|---|---|---|---|
| | | **Instructional Hours** | **18** |
| | | **Total Hours** | **90** |

**Text Book:**
1. Pankaj Agarwal, **"Information Security & Cyber Laws"**, Acme Learning Private Limited, First Edition,2010

**Reference Books:**
1. Amy Rose, Deborah Arrand, Kristin E. Ohlim, Malloy, Michael G. Solomon, Mike Chapple, **"Information Security Illuminated"**, Jones & Barlett Publishers, 2005.
2. Lawrence C. Miller, **"Cyber Security for Dummies"**, John Wiley & Sons, Inc

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Case Study Presentation | Seminar | Assignment | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO2 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO3 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO4 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO5 | H | H | M | M | M | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HoD | Checked by | Approved by |
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| Course Code | Title | | |
|---|---|---|---|
| **21U3CAE609** | **Discipline Specific** **Elective Paper III: Artificial Intelligence** | | |
| **Semester: VI** | **Credits: 4** | **CIA: 50 Marks** | **ESE: 50 Marks** |

**Course Objective:**

To enable the students to understand the Artificial Intelligence as a Problem Solving techniques.

**Course Outcomes (CO):**

| CO1 | Knowledge about overview of Artificial Intelligence |
|---|---|
| CO2 | Gain Knowledge about Problem Solving methods |
| CO3 | Understand how to represent Knowledge and its works |
| CO4 | Understand how to use reasoning methods by constructing plans |
| CO5 | Understand methods of Knowledge Generation using Learning |

**Offered by: Computer Applications**

**Course Content**                                    **Instructional Hours/Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Introduction:** What is AI?- The foundation of AI- AI Problems. Intelligent Agent: Introduction-How Agent should act-Structure of Intelligent Agent | 1 2 | 1,2 1 |
| | **Instructional Hours** | | **18** |
| **II** | **Problem Solving by searching:** Problem Solving Agents-Formulating Problems-Examples: 8 queens problem. Search Strategies- Game Playing: Minim ax-Alpha-Beta Pruning. | 1 | 3,5 |
| | **Instructional Hours** | | **18** |
| **III** | **Knowledge and Reasoning:** A Knowledge based agent-Representation, Reasoning and Logic. Propositional Logic-Very simple Logic- Introduction to First Order Logic. | 1 | 6,7 |
| | **Instructional Hours** | | **18** |
| **IV** | **Planning:** A simple planning agent – From Problem solving to Planning – Basic Representation of Planning – A partial Order Planning Algorithm- Example**. Learning:** A General model of Learning Agent – Inductive Learning – Learning from Decision Trees. | 1 | 11 |
| | **Instructional Hours** | | **18** |
| **V** | Expert Systems- Definition – Features of an expert system – Organization – Characteristics – Prospector – Knowledge Representation in expert systems – Expert system tools – MYCIN – EMYCIN. | 3 | 1,2 |
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Books:**
1. Stuart J.Russell, Peter Norvig, **"Artificial Intelligence – A Modern Approach"**, Prentice Hall Incorporation.
2. Elaine Rich, Kevin Knight, Shivasankar B.Nair, **"Artificial Intellignence", Third Edition**, Tata-McGraw, 2009.
3. Donald A.Waterman, 'A Guide to Expert Systems', Pearson Education

**Reference Book:**
1. Deepak Khemani, **"A First course in Artificial Intelligence"**, McGraw Hill Education Pvt Ltd, 2013.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Class Participation | Seminar | Assignment | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
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| Course Code | Title |
|---|---|
| **21U3CAE610** | **Discipline Specific**<br>**Elective Paper III: Software Project Management** |
| **Semester: VI** | **Credits: 4**    **CIA: 50 Marks**    **ESE: 50 Marks** |

**Course Objective:**

      To understand and develop projects and also solve problems in software project management, know how to do project planning for the software process and learn the cost estimation techniques during the analysis of the project.

**Course Outcomes:**

| CO1 | Remember the importance of Software Project Management |
|---|---|
| CO2 | Understand the Software approaches, Estimation and Software Quality |
| CO3 | Apply activity planning and resource allocation |
| CO4 | Analyze, Interpret, Contrast and compare managing peoples |
| CO5 | Understand the Software Quality and Management |

**Offered by: Computer Application**

**Course Content**                  **Instructional Hours/Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Introduction to Software Project Management:** Introduction – why is software project management importance – Project – s/w projects versus other types of project – Activities covered by s/w project management – Some ways of categorizing s/w projects – Management – Problems with s/w projects – Overview of Project Planning. **Project Evaluation:** Evaluation of individual projects – Technical assessment – Cost benefit evaluation techniques – Risk evaluation. | 1 | 1,2 |
| | **Instructional Hours** | | **18** |
| **II** | **Selection Approach:** Introduction – Choosing technologies – Structure versus speed of delivery – Waterfall model – V-process model – Spiral model. **Software Estimation:** Basis for s/w estimating – s/w effort estimation techniques – Albrecht function point analysis – COCOMO model. **Risk Management**: Risk – Categories of risk – Framework – Risk identification – Risk assessment – Risk planning – Risk management – Evaluating risk – Applying PERT technique. | 1 | 4, 5 & 7 |
| | **Instructional Hours** | | **18** |
| **III** | **Activity Planning:** Introduction – Objectives – Project Schedules – Project and Activities – Sequencing and Scheduling activities – Network planning models – Formulating a network model – Forward pass – Backward pass – Identifying critical activities. **Resource Allocation:** Nature of resources – Identifying resource requirements – Scheduling resources – publishing resource schedule – Cost schedules – Scheduling Sequence. | 1 | 6 & 8 |
| | **Instructional Hours** | | **18** |
| **IV** | **Monitoring and Control:** Creating Framework – Collecting data – Visualizing progress – Cost monitoring – Prioritizing monitoring – Change control. **Managing People:** Organizational behavior – Selecting right person for the job – Motivation – Oldham-Hackman job characteristics model – Decision Making – Leadership – Organizational structures. | 1 | 9,11 |
| | **Instructional Hours** | | **18** |

| **V** | **Software Quality:** Introduction – Importance – Definition – ISO 9126 – Practical s/w quality measures Product versus process quality management – Techniques – Quality plans. | 1 | 13 |
|---|---|---|---|
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Book:**
1. Bob Hughes, Mike Cotterell, Rajib Mall **"Software Project Management",** Tata McGraw Hill Education, Fifth Edition, 2011.

**Reference Book(s):**
1. Kelkar.S.A **"Software Project Management – A Concise Study",** Prentice Hall of India Publication, Third Edition, 2012.
2. Joel Henry **"Software Project Management A Real World guide to Success",** Pearson Education Publication, First Edition, 2003.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Case Study presentation | Seminar | Assignment | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO2 | H | H | M | M | M | L | M | H | H | H | H | M | M |
| CO3 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO4 | H | H | M | M | M | L | M | H | H | H | H | H | H |
| CO5 | H | H | M | M | M | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
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| Course Code | Title | | |
|---|---|---|---|
| **21U3CAE611** | **Discipline Specific** **Elective Paper III: Bioinformatics** | | |
| **Semester: VI** | **Credits: 4** | **CIA:50 Marks** | **ESE:50 Marks** |

**Course Objective:**

To explore the functional areas of Bioinformatics and to be familiarized with Biological Databases.

**Course Outcomes:**

| CO1 | To Understand the basic concepts of Bioinformatics and its applications. |
|---|---|
| CO2 | To interpret various Biological Databases. |
| CO3 | To learn about the various file formats and data representation standards |
| CO4 | To Illustrate about Database Similarity Searching |
| CO5 | To demonstrate the working nature of sequence alignment |

**Offered by: Computer Applications**

**Course Content**            **Instructional Hours/Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Bioinformatics:** Introduction to Bioinformatics – Goal – Scope – Applications – Limitations –DNA Sequence Analysis: Why analyses DNA? – Gene Structure & DNA Sequence – Features of DNA Sequence Analysis. Examples of related tools and software. Data generation; Generation of large scale molecular biology data. | 1 &2 | 1 &5 |
| | **Instructional Hours** | | **18** |
| **II** | **Introduction to data types and Source:** Population and sample, Classification and Presentation of Data. Quality of data, private and public data sources. Introduction to Biological Databases: Types of Database – Biological Database – Pitfalls of Biological Database – Information retrieval from Biological databases. Nucleic acid databases ,Protein databases (Primary, Composite, and Secondary). Specialized Genome databases: Structure databases | 1 | 2 |
| | **Instructional Hours** | | **18** |
| **III** | **Format and Annotation:** Conventions for databases indexing and specification of search terms; Common sequence file formats; Files for multiple sequence alignment; Files for structural data; Flat files, relational, object oriented databases and controlled vocabularies. File Format (Genbank, DDBJ, FASTA, PDB, SwissProt). Introduction to Metadata and search; Indices, Boolean, Fuzzy, Neighboring search. The challenges of data exchange and integration. Ontologies, interchange languages and standardization efforts. | 2 | 6 |
| | **Instructional Hours** | | **18** |
| **IV** | **Database Similarity Searching:** Unique Requirements of database searching – Heuristic database searching – Basic local alignment search tool (BLAST) – FASTA – Comparison of FASTA & BLAST – Database searching with smith – waterman method. | 1 | 4 |
| | **Instructional Hours** | | **18** |

| V | **Introduction to Sequences, alignments and Dynamic Programming**; Local alignment and Global alignment (algorithm and example), Pairwise alignment (BLAST and FASTA Algorithm) and multiple sequence alignment (Clustal W algorithm). Methods for presenting large quantities of biological data: sequence viewers (Artemis, SeqVISTA), 3D structure viewers (Rasmol, SPDBv, Chime, Cn3D, PyMol), Anatomical visualization. Representation of patterns and relationship: Regular Expression, Hierarchies, and Graphical models. | 1 | 2,3&5 |
|---|---|---|---|
| | | **Instructional Hours** | **18** |
| | | **Total Hours** | **90** |

**Text Book(s):**
1. JinXiong **"Essential Bioinformatics",** Cambridge University Press 2016
2. T K Attwood & D J Parry Smith, **"Introduction to Bioinformatics",** Pearson Education 2007

**Reference Book(s):**
1. Jean-Michel Claverie , Cedric Notredame **Bioinformatics – A Beginner's Guide** Wiley Computer Publishing 2009.
2. ShubaGopal, Rhys Price Jones,PaulTymann,AnneHaake "**Bioinformatics with fundamentals of Genomics and Proteomics"** Tata McGraw Hill 2010.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Class Participation | Seminar | Assignment | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | M | M | M | L | M | H | H | H | H | M | M |
| **CO2** | H | H | M | M | M | L | M | H | H | H | H | M | M |
| **CO3** | H | H | M | M | M | L | M | H | H | H | H | H | H |
| **CO4** | H | H | M | M | M | L | M | H | H | H | H | H | H |
| **CO5** | H | H | M | M | M | L | M | H | H | H | H | H | H |

H-High; M-Medium; L-Low

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title |
|---|---|
| **21U3CAE612** | **Discipline Specific**<br>**Elective Paper III: Mobile Application Development** |
| **Semester: VI** | **Credits: 4** | **CIA: 50 Marks** | **ESE:50   Marks** |

**Course Objective:**

Aim of the course is to understand the architecture, platform and tools required for mobile application and develop real time mobile application.

**Course Outcomes (CO):**

| CO1 | Remember the Android SDK and UI Components |
|---|---|
| CO2 | Understand the Icons, Layouts, Menus, Graphics and Animation |
| CO3 | Apply the concepts of Graphics and perform animation |
| CO4 | Analyze the usage and implementation of Android Studio |
| CO5 | Understand Animation and Database |

**Offered by: Computer Applications**

**Course Content**                                    **Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | Introduction to Mobile Computing, Introduction to Android Development Environment, Factors in Developing Mobile Applications, Mobile Software Engineering, Frameworks and Tools, Generic UI Development, Android User, Basic User Interface Screen elements, Designing User Interfaces with Layouts. | 1 | 1-2 |
| | **Instructional Hours** | | **18** |
| **II** | Intents and Services: Android Intents and Services, Characteristics of Mobile Applications, Successful Mobile Development. Storing and Retrieving Data: Synchronization and Replication of Mobile Data, Getting the Model Right, Android Storing and Retrieving Data, Working with a Content Provider. Communications Via Network and the Web: State Machine, Correct Communications Model, Android Networking and Web. | 1 | 3-5 |
| | **Instructional Hours** | | **18** |
| **III** | Gallery, drawing 2D and 3D Graphics and Multimedia, Drawing and Working with Animation. Networking, Telephony and Location, Android Networking, Web and Telephony API. Search, Location and Mapping, Communication, Identity, Sync and      social media. Sensor and Hardware Programming. | 1 | 6-8 |
| | **Instructional Hours** | | **18** |
| **IV** | Sensor and Hardware Programming, Create ―Hello World‖ application. That will display ―Hello World‖ in the middle of the screen in the emulator. Create an application with login module. (Check username and password), Create a menu with 5 options and and selected option should appear in text box. Create a list of all courses in your college and on selecting a particular course teacher-in-charge of that course should appear at the bottom of the screen. | 1 | 9-13 |
| | **Instructional Hours** | | **18** |

| | | | |
|---|---|---|---|
| **V** | Connecting Databases with android,Create an application with three option buttons, on selecting a button colour of the screen will change.Create and Login application as above. On successful login, pop up the message. Create an application to Create, Insert, update, Delete and retrieve operation on the database. | 1 | 14-18 |
| | | **Instructional Hours** | **18** |
| | | **Total Hours** | **90** |

**Text Book:**
1. Budi Kurniawan,**A Beginner's Tutorial, Android Application Development** ,Brainy Software, 2015

**Reference Books:**
1. Charlie Collins, Michael Galpin, Matthias Kappler, **Android in Practice** ,Manning,2011
2. AnubhavPradhan, Anil V. Deshpande, **Composing Mobile Apps: Learn,Explore, Apply using Android,**Wiley,Publications,2014.
3. Jeff Mcwherter, Scott Gowell, **Professional Mobile Application Development** ,Wrox Publisher,2012

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Class Participation | Seminar | Assignment | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | M | M | M | L | M | H | H | H | H | M | M |
| **CO2** | H | H | M | M | M | L | M | H | H | H | H | M | M |
| **CO3** | H | H | M | M | M | L | M | H | H | H | H | H | H |
| **CO4** | H | H | M | M | M | L | M | H | H | H | H | H | H |
| **CO5** | H | H | M | M | M | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title | | |
|---|---|---|---|
| **21U4CK3ED1** | **Extra Departmental Course : Multimedia Tools  - Practical** | | |
| **Semester: III** | **Credits: 2** | **CIA: - -** | **ESE: 50 Marks** |

**Course Objective**

      To make the students to be a proficient in a broad range of design skills and animation.

**Course Outcomes**

| CO1 | Remember the graphics concepts |
|---|---|
| CO2 | Understand the multimedia tools and techniques |
| CO3 | Apply the graphical designs and functions using Photoshop, CorelDraw and Flash |
| CO4 | Create Professional design & animation |
| CO5 | Create Animated Objects |

**Offered by: Computer Applications**

**Course Content**               **Instructional Hours / Week: 2**

| S. No | List of Practical for Photoshop |
|---|---|
| 1 | Create Sun Flower using Photoshop. |
| 2 | Animate Plane Flying the Clouds using Photoshop. |
| 3 | Create Plastic Surgery for Nose using Photoshop. |
| 4 | Create See thru text using Photoshop. |
| 5 | Create Web Page using Photoshop. |
| | **List of Practical for CorelDraw** |
| 6 | Create a 3D text in Corel Draw |
| 7 | Create a logo for your department in Corel Draw. |
| 8 | Create an advertisement for a Textile company in Corel Draw. |
| 9 | Using Corel Draw, design a business card for a company. |
| 10 | Using Corel Draw, design a banner for a marriage function. |
| | **Total Hours**          **30** |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low.**

| Course Designed by | Verified by HOD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
| | | | |
| | | | |

| Course Code | Title | | |
|---|---|---|---|
| **21U4CK3ED2** | **Extra Departmental Course:** <br> **Web Development using HTML - Practical** | | |
| **Semester: III** | **Credits: 2** | **CIA: - -** | **ESE:50 Marks** |

**Course Objective:**

> To enable the student to create the static web pages and web applications.

**Course Outcomes:**

| CO1 | Remember about WebPages and Web sites. |
|---|---|
| CO2 | Understand about different HTML Tags |
| CO3 | Apply the tags which they understood to design web pages and web applications |
| CO4 | Analyze the usage of Web tags |
| CO5 | Evaluate website on real world problems according to dynamic content |

**Offered by: Computer Applications**

**Course Content**                              **Instructional Hours / Week: 2**

| Prog. No. | List of Programs |
|---|---|
| 1 | Develop a HTML document which displays the entire header tags, it must open another HTML document. |
| 2 | Write names of several countries in a paragraph and store it as an HTML document, world.html. Each country name must be a hot text. When you click India (for example), it must open india.html and it should provide a brief introduction about India. |
| 3 | Design a HTML document describing you. Assign a suitable background design and background color and a text color and Image. |
| 4 | Write a HTML program using Marquee Behavior. |
| 5 | Write a HTML document to print your class Time Table. |
| 6 | Develop a Complete Web Page using Frames and Framesets which gives the Information about a Hospital using HTML. |
| 7 | Design a HTML document with link to send e-mail messages. |
| 8 | Write a HTML Program to illustrate the ordered list. |
| 9 | Write a HTML Program to print your Bio-Data in the following format: NAME Religion Community Street Town District State Address PIN Code Office Phone Residence Mobile Educational Qualification Degree University / Institute Month & year Grade / Mark. |
| 10 | Develop a HTML document to display a Registration Form for an inter-collegiate function. |
| | **Total Hours**         **30** |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H - High; M - Medium; L - Low.**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

| Course Code | Title | |
|---|---|---|
| **21UCASS01** | **Self-Study Paper: Problem Solving and Programming** | |
| **Semester: II - V** | **Credits: 1** | **ESE:50 Marks** |

## Course Objective

To understand the basic concepts of problem-solving approaches and develop optimal program structure using conditional and iterative control structures and functions.

## Course Outcomes

| | |
|---|---|
| **CO1** | To understand the basic logics for coding a program |
| **CO2** | To design a computational solution for a given problem |
| **CO3** | To break a problem into logical modules that can be solved (programmed) |
| **CO4** | To transform a problem solution into programs involving programming constructs |
| **CO5** | To write programs using structures, strings, arrays, pointers and files for solving complex computational problem |

**Offered by: Computer Applications**

**Course Content**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Introduction To Computer Problem Solving:** Introduction – The Problem Solving aspect – Top down design – Implementation of algorithm – Program Verification – The efficiency of algorithm – The analysis of algorithm. | 1 | 1 |
| **II** | **Programming, Algorithms and Flowcharts:** Programs and programming – building blocks for simple programs – programming life cycle phases – pseudo code representation – flow charts – algorithm – programming languages – compiler – interpreter, loader and linker – program execution – classification of programming language – structured programming concept. | 2 | 1 |
| **III** | **Basics of 'C', input / output & control statements:** Introduction – identifier – keywords – variables – constants – i/o statements – selection – iteration and repetitive execution – go to statement – nested loops – continue and break statements. | 3 | 2-6 |
| **IV** | **Arrays, Strings, Functions and Pointers:** Array – one dimensional characters arrays – multidimensional arrays – array of strings – two dimensional character array – functions – parameter passing mechanism scope – storage classes recursion – comparing iteration and recursion .<br>**Pointers** – pointer operators - uses of pointers – arrays and pointers – pointers and strings – pointer indirection – pointers to functions – dynamic memory allocation. | 3 | 7-10 |

| V | **User-defined data types & files:** Structures – initialization – nested structures – structures and arrays – structures and pointers – union – typedef and enumeration types – bit fields – file management in C – files and streams – file handling functions – sequential access file – random access file – command line arguments. | 3 | 13-14 |
|---|---|---|---|
| | | | |

**Text Books:**
1. R.G.Dromey , How To Solve It By Computer , Pearson education , fifth edition, 2007.
2. Pradip Dey, Manas Ghosh, Fundamentals of Computing and Programming in C, First Edition, Oxford University Press, 2009.
3. Kamthane, A.N., Programming with ANSI and Turbo C, Pearson Education, Delhi,2006

**Reference Books:**
1. Ashok N Kamthane , Programming with ANSI and Turbo C, Pearson Edition Publ, 2002.
2. Henry Mullish & Huubert L.Coope, The Sprit of C, Jaico Pub. House, 1996.

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low.**

| Course Designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
| | | | |
| | | | |

| Course Code | Title | |
|---|---|---|
| **21UCASS02** | **Self-Study Paper:   Web Design Using HTML** | |
| **Semester: II - V** | **Credits: 1** | **ESE:50 Marks** |

**Course Objective:**

      To offer students the fundamental knowledge of application development for the internet using HTML.

**Course Outcomes:**

| | |
|---|---|
| **CO1** | Create an HTML Documents and establish adequate formatting for presentation purposes |
| **CO2** | Import, insert and modify images and tables |
| **CO3** | Establish and maintain internal and external link to available resources |
| **CO4** | Use special effect to make the expressive, evocative documents |
| **CO5** | Manager forms (Create forms, call programs) |

**Offered by: Computer Applications**

**Course Content:**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Introduction to HTML:** History of HTML, HTML Generations, HTML Documents, Hyper Links. | 1 | 4,5 |
| **II** | **Head and Body:** Header Section, Title, Prologue, Links, Comment lines.<br>**Designing the Body Section:** Heading Printing, Aligning the Headings, Horizontal Rule, Paragraph, Tab Setting, Images and Pictures. | 1 | 6 |
| **III** | **Ordered and Unordered Listing:** Lists, Unordered Lists, Headings in a List, Ordered Lists, Nested Lists.<br>**Table Handling:** Tables, Table Creation in HTML, Width of the tables and cells, Column Specification, some sample tables. | 1 | 7,8 |
| **IV** | **DHTML and Style Sheets:** Defining Styles, Elements of Styles, Linking a style sheet to a HTML Document, In-line Styles, External Style Sheets, Internal Style Sheets, Multiple Styles.<br>**Frames:** Frameset Definition, Frame definition, Nested framesets. | 1 | 9,10 |
| **V** | **A Web Page Design Project:** Frameset definition, Animals, Birds, Fish.<br>**Forms:** Action attribute, Method attribute, Enctype attribute, Drop Down List, Sample Forms. | 1 | 11,12 |

**Text Book**:
1. C. Xavier , **World Wide Web Design With Html**, Tata McGraw Hill Education Private Limited, New Delhi.

**Reference Books:**
1. Special Edition **Using Intranet HTML** / Mark Surfas, Mark Brown and John Juge

2. **Dynamic HTML Web Magic** / JefDou*yer – Hayden development group*

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**Mapping**

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| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO2 | H | H | L | M | H | L | M | H | H | H | H | M | M |
| CO3 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO4 | H | H | L | M | H | L | M | H | H | H | H | H | H |
| CO5 | H | H | L | M | H | L | M | H | H | H | H | H | H |

**H-High; M-Medium; L-Low.**

| Course Designed by | Verified by | Checked by | Approved by |
|--------------------|-------------|------------|-------------|
|                    |             |            |             |
|                    |             |            |             |