

Department of  
Computer Technology

Syllabus

2021 – 2024 Batch

# DEPARTMENT OF COMPUTER TECHNOLOGY

## Syllabus

**BATCH: 2021 – 2024**

### Faculty Members

**Dr. M. Rajasenathipathi, M.C.A., M. Phil., Ph.D.,**

**Ms. C. Keerthana, M.Sc., M. Phil., (Ph.D),,**

**Ms. K. S. Leelavathi, M.Sc., M. Phil., NET., SET., (Ph.D),,**

**Dr. R. Jayaprakash, M.C.A., M.Phil., Ph.D.,**

**Ms. A. Kalaivani, M.C.A., M. Phil., (Ph.D),,**



**Nallamuthu Gounder Mahalingam College**

**An Autonomous Institution affiliated to Bharathiar University  
Re-Accredited by NAAC and ISO 9001:2015 Certified Institution**

**Pollachi – 642 001.**

## **NGM College**

### **Vision**

**Our dream is to make the college an institution of excellence at the national level by imparting quality education of global standards to make students academically superior, socially committed, ethically strong, spiritually evolved and culturally rich citizens to contribute to the holistic development of the self and society.**

### **Mission**

**Training students to become role models in academic arena by strengthening infrastructure, upgrading curriculum, developing faculty, augmenting extension services and imparting quality education through an enlightened management and committed faculty who ensure knowledge transfer, instill research aptitude and infuse ethical and cultural values to transform students into disciplined citizens in order to improve quality of life.**

## **Department of Computer Technology**

### **Vision**

**To continue to be the Premier Department for Computer Technology and to become regionally top-ranked and nationally recognized for Academic Excellence**

### **Mission**

- **To offer a broad-based education, encourage lifelong learning, foster teamwork, promote creativity, discovery and competitiveness**
- **To turn out highly qualified graduates into world-class professionals capable of competing in the IT Arena as well as in a research environment**

### Program Educational Objectives:

|             |   |
|-------------|---|
| <b>PEO1</b> | Demonstrating the concepts and technologies of Software Industry                                      |
| <b>PEO2</b> | Motivate to select one domain knowledge and develop smart software solutions as per industry standard |
| <b>PEO3</b> | Focus to solve real time problems in terms of various technologies.                                   |
| <b>PEO4</b> | Understand the concepts of software project life cycle during software development.                   |
| <b>PEO5</b> | Apply the knowledge of various levels of security in computer field.                                  |

### Program Outcomes:

|            |   |
|------------|---|
| <b>PO1</b> | Under Graduate students are to apply, algorithmic, real time and Industry standard reasoning to a variety of computational problems                                 |
| <b>PO2</b> | Understand the fundamental knowledge of various domains in IT Industry and change their carrier as per Industry Demand.   |
| <b>PO3</b> | Combine the knowledge of mathematics and Software Technologies in the field of Software project development   |
| <b>PO4</b> | Implement industry standard projects of their own choice using latest tools.  |
| <b>PO5</b> | Improve the aptitude skill to clear various levels of entrance exams in their carrier.  |
| <b>PO6</b> | The Under Graduate students are recognize the Human Excellence and ethical responsibilities through yoga in various disciplines                                     |
| <b>PO7</b> | Demonstrate global Industry demand related subjects and transferable skills that are relevant to global industry and employment opportunities                       |
| <b>PO8</b> | Graduates will recognize the need for self-motivation to update in technologies to be in par with changing technology   |
| <b>PO9</b> | Ability to analyze the local and global impact of computing on individuals, organizations and society.  |
| <b>P10</b> | Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large. |

**Program Specific Outcomes:**

|                 |   |
|-----------------|---|
| <b>PSO – 01</b> | Acquire academic excellence with professional skill for employment and higher studies.                          |
| <b>PSO – 02</b> | Create, select and apply modern tools and techniques to analyze and develop successful software in IT Industry. |

**Nallamuthu Gounder Mahalingam College - Curriculum Development Cell**  
**Scheme of Examination For 2021 - 2022**  
**Choice Based Credit System & OBES**

**For Part I and Part II in First & Second Semesters Only**

**SEMESTER - I**

| Part         | Subject Code                         | Title of the Paper  | Hrs / Week |          | Hrs / Sem. | Exam Hrs. | Maximum Marks |            | Total Marks | Credits   |
|--------------|--------------------------------------|---|------------|----------|------------|-----------|---------------|------------|-------------|-----------|
|              |                                      |   | L          | P        | T          |           | Internal      | External   |             |           |
| I            | 21UTL101 /<br>21UHN101 /<br>21UFR101 | Tamil Paper - I /   | 6          | -        | -          | 3         | 50            | 50         | 100         | 3         |
|              |                                      | Hindi Paper - I /   | 6          | -        | -          |           |               |            |             |           |
|              |                                      | French Paper - I  | 6          | -        | -          |           |               |            |             |           |
| II           | 21UEN101                             | Communication Skills - I ( Level I )                                    | 5          | -        | -          | 3         | 50            | 50         | 100         | 3         |
|              | 21UEN102                             | Communication Skills - I ( Level II )                                   | 5          | -        | -          |           |               |            |             |           |
| III          | 21UCT101                             | CORE - I :<br>Programming in C  | 4          | -        | -          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT102                             | CORE II: Digital Fundamentals and Computer Organization                 | 4          | -        | -          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT1A1                             | ALLIED I: Mathematics - I: Mathematical Structures For Computer Science | 5          | -        | -          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT103                             | CORE LAB -I :<br>Programming in C                                       | -          | 4        | 0          | 3         | 25            | 25         | 50          | 2         |
| IV           | 21UHR101                             | Human Rights  | 1          | -        | -          | 2         | -             | 50         | 50          | 2         |
|              | 21HEC101                             | Human Excellence - Personal Values & SKY Yoga Practice - I              | 1          | -        | -          | 2         | 25            | 25         | 50          | 1         |
| V            |                                      | Extension Activities - Annexure I                                       | -          | -        | -          | -         | -             | -          | -           | -         |
| CC           | 21CFE101                             | Fluency in English - I  | -          | -        | -          | -         | -             | -          | -           | -         |
|              |                                      | Online Course (Optional) (MOOC / NPTEL / SWAYAM )                       |            |          |            |           |               |            |             | Grade     |
| <b>Total</b> |                                      |   | <b>26</b>  | <b>4</b> | <b>0</b>   | <b>22</b> | <b>300</b>    | <b>350</b> | <b>650</b>  | <b>23</b> |

**SEMESTER – II**

| Part         | Subject Code                         | Title of the Paper  | Hrs / Week |          | Hrs / Sem. | Exam Hrs. | Maximum Marks |            | Total Marks | Credits   |
|--------------|--------------------------------------|---|------------|----------|------------|-----------|---------------|------------|-------------|-----------|
|              |                                      |   | L          | P        | T          |           | Internal      | External   |             |           |
| I            | 21UTL202 /<br>21UHN202 /<br>21UFR202 | Tamil Paper - II /  | 6          | -        | -          | 3         | 50            | 50         | 100         | 3         |
|              |                                      | Hindi Paper - II /  | 6          | -        | -          |           |               |            |             |           |
|              |                                      | French Paper - II   | 6          | -        | -          |           |               |            |             |           |
| II           | 21UEN202                             | Communication Skills – II ( Level I )                     | 5          | -        | -          | 3         | 50            | 50         | 100         | 3         |
|              | 21UEN203                             | Communication Skills – II ( Level II )                    | 5          | -        | -          |           |               |            |             |           |
| III          | 21UCT204                             | CORE III: Object oriented Programming with C++            | 4          | -        | -          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT205                             | Core - IV :Data Structures                                | 4          | -        | -          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT2A2                             | Allied - II : Mathematics II – Operations Research        | 4          | -        | -          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT206                             | Core Lab - II : Programming in C++ with data Structures   | -          | 4        | -          | 3         | 25            | 25         | 50          | 2         |
| IV           | 21EVS201                             | Environmental Studies                                     | 2          | -        | -          | 2         | -             | -          | 50          | 2         |
|              | 21HEC202                             | Human Excellence - Family Values & SKY Yoga Practice - II | 1          | -        | -          | 2         | 25            | 25         | 50          | 1         |
| V            |                                      | Extension Activities - Annexure I                         | -          | -        | -          | -         | -             | -          | -           | -         |
| CC           | 21CFE202                             | Fluency in English – II                                   | -          | -        | -          | -         | -             | -          | -           | -         |
|              | 21CMM201                             | Manaiyiyal Mahathuvam - I                                 | 1          | -        | -          | 2         | -             | 50         | 50*         | Grade     |
|              | 21CUB201                             | Uzhavu Bharatham – I                                      | 1          | -        | -          | 2         | -             | 50         | 50*         | Grade     |
|              |                                      | Online Course (Optional) (MOOC / NPTEL / SWAYAM )         |            |          |            |           |               |            |             | Grade     |
| <b>Total</b> |                                      |   | <b>26</b>  | <b>4</b> | <b>-</b>   | <b>26</b> | <b>300</b>    | <b>350</b> | <b>650</b>  | <b>23</b> |

**SEMESTER – III**

| Part         | Subject Code        | Title of the Paper                                    | Hrs / Week |          | Hrs / Sem. | Exam Hrs. | Maximum Marks |            | Total Marks | Credits   |
|--------------|---------------------|---|------------|----------|------------|-----------|---------------|------------|-------------|-----------|
|              |                     |   | L          | P        | T          |           | Internal      | External   |             |           |
| III          | 21UCT307            | Core V: Java Programming                              | 5          |          | 6          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT308            | Core VI: Database Management System                   | 5          |          | 8          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT309            | Core VII: Operating Systems                           | 5          |          | 4          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT3A3            | Allied - III : Software Engineering                   | 5          |          | 6          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT310            | Lab - III :Java Programming Lab                       | -          | 4        | 0          | 3         | 50            | 50         | 100         | 2         |
|              | 21UCT311            | Lab-IV: Database Management System Lab                | -          | 4        | 0          | 3         | 25            | 25         | 50          | 2         |
| IV           | 21UCT3N1 / 21UCT3N2 | Non Major Elective - I : HTML Lab / Multimedia Lab    | 1          | -        | -          | 2         | -             | 50         | 50          | 2         |
|              | 21HEC303            | Human Excellence - Professional Values & Ethics – III | 1          | -        | -          | 2         | 25            | 25         | 50          | 1         |
| V            |                     | Extension Activities - Annexure I                     | -          | -        | -          | -         | -             | -          | -           | -         |
| CC           | 21CFE303            | Fluency in English – III                              | -          | -        | -          | -         | -             | -          | -           | -         |
|              | 21CMM302            | Manaiyiyal Mahathuvam - II                            | 1          | -        | -          | 2         | -             | 50         | 50*         | Grade     |
|              | 21CUB302            | Uzhavu Bharatham – II                                 | 1          | -        | -          | 2         | -             | 50         | 50*         | Grade     |
| <b>Total</b> |                     |   | <b>22</b>  | <b>8</b> | <b>24</b>  | <b>28</b> | <b>300</b>    | <b>300</b> | <b>600</b>  | <b>23</b> |



**SEMESTER – IV**

| Part         | Subject Code          | Title of the Paper  | Hrs / Week |          | Hrs / Sem. | Exam Hrs. | Maximum Marks |            | Total Marks | Credits   |
|--------------|-----------------------|---|------------|----------|------------|-----------|---------------|------------|-------------|-----------|
|              |                       |   | L          | P        | T          |           | Internal      | External   |             |           |
| III          | 21UCT412              | Core VIII: Advanced Java Programming                          | 5          |          | 4          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT413              | Core IX: Linux And Shell Programming                          | 5          |          | 4          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT414              | Core X: Data Communication And Networks                       | 5          |          | 3          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT4A4              | Allied IV: Big Data Management                                | 5          |          | 3          | 3         | 50            | 50         | 100         | 4         |
|              | 21UCT415              | Lab - V: Advanced Java Programming Lab                        |            | 4        | 0          | 3         | 50            | 50         | 100         | 2         |
|              | 21UCT416              | Lab - VI : Linux And Shell Programming Lab                    |            | 4        | 0          | 3         | 50            | 50         | 100         | 2         |
| IV           | 21UCT4N1/<br>21UCT4N2 | Non-Major Elective II - Office Automation Lab / CorelDraw Lab | 1          | -        | -          | 2         | -             | 50         | 50          | 2         |
|              | 21HEC404              | Human Excellence - Social Values & SKY Yoga Practice -IV      | 1          | -        | -          | 2         | 25            | 25         | 50          | 1         |
| V            |                       | Extension Activities - Annexure I                             | -          | -        | -          | -         | -             | 50         | 50          | 1         |
| CC           | 21CFE404              | Fluency in English – IV                                       | -          | -        | -          | -         | -             | -          | -           | -         |
|              | 21CMM403              | Manaiyiyal Mahathuvam – III                                   | 1          | -        | -          | 2         | -             | 50         | 50*         | Grade     |
|              | 21CUB403              | Uzhavu Bharatham – III  | 1          | -        | -          | 2         | -             | 50         | 50*         | Grade     |
| <b>Total</b> |                       |   | <b>22</b>  | <b>8</b> | <b>14</b>  | <b>28</b> | <b>325</b>    | <b>425</b> | <b>750</b>  | <b>24</b> |

| SEMESTER - V |   |  |            |    |            |           |               |          |             |         |
|--------------|---|--|------------|----|------------|-----------|---------------|----------|-------------|---------|
| Part         | Subject Code                            | Title of the Paper   | Hrs / Week |    | Hrs / Sem. | Exam Hrs. | Maximum Marks |          | Total Marks | Credits |
|              |   |  | L          | P  | T          |           | Internal      | External | 100         |         |
| III          | 21UCT517                                | CORE COURSE XI:<br>Open Source Technologies  | 6          | -  | 2          | 3         | 50            | 50       | 100         | 5       |
|              | 21UCT518                                | CORE COURSE XII:<br>Information Security   | 6          | -  | 2          | 3         | 50            | 50       | 100         | 5       |
|              | 21UCT5E1 /<br>21UCT5E2<br>/<br>21UCT5E3 | DSE - I<br>:Cloud Computing /<br>Embedded Systems /<br>Management Information System | 6          |    | 2          | 3         | 50            | 50       | 100         | 6       |
|              | 21UCT519                                | CORE COURSE LAB -<br>VII: Open Source Technologies                                   | -          | 5  | 0          | 3         | 50            | 50       | 100         | 2       |
|              | 21UCT520                                | CORE COURSE LAB<br>- VIII: Web Designing   | -          | 4  | 0          | 3         | 50            | 50       | 100         | 2       |
|              | 21UCT5S1 /<br>21UCT5S2                  | <b>Skill Based Major Elective I</b> : Python Lab /HTML5 With CSS Lab                 | 2 Hours    |    |            | 2         | 25            | 25       | 50          | 2       |
| IV           | 21HEC505                                | Human Excellence -<br>National Values &<br>SKY Yoga Practice -<br>V                  | 1          | -  | -          | 2         | 25            | 25       | 50          | 1       |
|              |   | Extension Activities -<br>Annexure I   | -          | -  | -          | -         | -             | -        | -           | -       |
| EC           | 21CFE505                                | Fluency in English -<br>V  | -          | -  | -          | -         | -             | -        | -           | -       |
|              | 21CSD501                                | Soft Skills Development - I  | -          | -  | -          | -         | -             | -        | -           | Grade   |
|              | 21GKL501                                | General Awareness -<br>Self Study (Online)<br>(SBE) (Optional)                       | SS         |    | -          | 2         | -             | 50       | 50*         | Grade   |
| EC           | 21UCT5AL                                | Advanced Learner Course - I : Software Testing- Self Study (Optional)                | SS         |    | -          | 3         | 50            | 50       | 100         | 4*      |
| EC           | 21UCT5VA                                | VAC I- IoT (Internet of Things) (Mandatory)  | 30 Hrs     |    | 2          | -         | 25            | 25       | 50          | 2*      |
| Total        |   |  | 19         | 11 | 6          | -         | 300           | 350      | 650         | 23      |

| SEMESTER – VI      |                                   |   |            |           |            |           |               |             |             |            |
|--------------------|-----------------------------------|---|------------|-----------|------------|-----------|---------------|-------------|-------------|------------|
| Part               | Subject Code                      | Title of the Paper  | Hrs / Week |           | Hrs / Sem. | Exam Hrs. | Maximum Marks |             | Total Marks | Credits    |
|                    |                                   |   | L          | P         | T          |           | Internal      | External    |             |            |
| III                | 21UCT621                          | CORE COURSE- XIII : Framework Technology  | 6          | -         | 8          | 3         | 50            | 50          | 100         | 4          |
|                    | 21UCT6E1 / 21UCT 6E2/ 21UCT 6E3   | DSE- II : Mobile Computing / Software Project Management / Grid Computing                 | 6          | -         | 4          | 3         | 50            | 50          | 100         | 5          |
|                    | 21UCT 6E4 / 21UCT 6E5 / 21UCT 6E6 | DSE - III : Artificial Intelligence /Under water Communication / Digital Image Processing | 6          | -         | 4          | 3         | 50            | 50          | 100         | 5          |
|                    | 21UCT622                          | CORE COURSE Lab - IX : Framework Technology   | -          | 5         | 0          | 3         | 50            | 50          | 100         | 3          |
|                    | 21UCT623                          | Project   | -          | 4         | 0          | -         | 50            | 50          | 100         | 4          |
|                    | 21UCT6S1 / 21UCT6S2               | SEC : Naan Mudhalvan - II : Data Analytics (Big Data) Lab / Dreamweaver Lab               | -          | -         | 2          | 0         | 2             | 25          | 25          | 50         |
| IV                 | 21HEC606                          | Human Excellence - Global Values & SKY Yoga Practice – VI                                 | 1          | -         | -          | 2         | 25            | 25          | 50          | 1          |
| V                  |                                   | Extension Activities - Annexure I   | -          | -         | -          | -         | -             | -           | -           | -          |
| EC                 | 21CFE606                          | Fluency in English - VI   | -          | -         | -          | -         | -             | -           | -           | -          |
|                    | 21CSD602                          | Soft Skills Development - II  | -          | -         | -          | -         | -             | -           | -           | Grade      |
| EC                 | 21UCT6AL                          | Advanced Learner Course - II : Data Analytics (Optional) - Self Study                     | SS         | -         | -          |           |               |             |             |            |
| EC                 | 21UCT6VA                          | VAC-II:PC Assembly and CCTV camera Installation (Mandatory)                               | 30 Hrs     | 2         | -          |           |               |             |             |            |
| <b>Total</b>       |                                   |   | <b>19</b>  | <b>11</b> | <b>16</b>  | <b>-</b>  | <b>300</b>    | <b>300</b>  | <b>600</b>  | <b>24</b>  |
| <b>Grant Total</b> |                                   |   |            |           |            |           | <b>1750</b>   | <b>2150</b> | <b>3900</b> | <b>140</b> |

AL – Advanced Learner Course (Optional);

VA – Department Specific Value Added

Course CC – Certification Course / Co - Scholastic Course

\* - Extra Credits & Extra Hour Course

Grand Total = 3900;

Total Credits = 140

K. SRINIVASAN, M.C.A.  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001

**Question Paper Pattern (Based  
on Bloom's Taxonomy)**

**K1-Remember; K2- Understanding; K3- Apply; K4-Analyze; K5- Evaluate**

**1. Theory Examinations: 70 Marks (Part I, II, & III)**

**(i) Test- I & II, ESE:**

| Knowledge Level        | Section   | Marks       | Description              | Total                           |
|------------------------|---|-------------|--------------------------|---------------------------------|
| K1 & K2<br>(Q 1 -10)   | A (Q 1 – 5 MCQ)<br>(Q 6–10 Define/Short Answer)     | 10 x 1 = 10 | MCQ Define               | 70<br>( Reduced to 50 for ESE ) |
| K3 (Q 11-15)           | B (Either or pattern)                               | 5 x 4 = 20  | Short Answers            |                                 |
| K4 & K5<br>(Q 16 – 21) | C ( Q -16 is Compulsory and Q 17 – 21 answer any 3) | 4 x 10 = 40 | Descriptive/<br>Detailed |                                 |

**2. Theory Examinations: 50 Marks (Part IV)**

| Knowledge Level          | Section   | Marks       | Description   | Total                           |
|--------------------------|---|-------------|---------------|---------------------------------|
| K1 & K2<br>(Q 1 -10)     | A (Q 1 – 5 MCQ)<br>(Q 6–10 Define / Short Answer) | 10 x 1 = 10 | MCQ Define    | 50<br>( Reduced to 25 for ESE ) |
| K3, K4 & K5<br>(Q 11-18) | B (Answer 5 out of 8)                             | 5 x 8 = 40  | Short Answers |                                 |

**3. Practical Examinations: 100/50 Marks**

| Knowledge Level | Criterion                  | External/Internal Marks | Total |
|-----------------|----------------------------|-------------------------|-------|
| K3              | Record work &<br>Practical | 50/50                   | 100   |
| K4              |                            | 25/25                   | 50    |
| K5              |                            |                         |       |

**\* In Theory ESE, Students will write Examination Maximum Marks as 70 and it will be reduced to 50 for Total Mark calculation.**

Components of Continuous Assessment

THEORY

Maximum Marks: 100;      CIA Mark: 50

| Components                      |                    | Calculation    | CIA Total |
|---------------------------------|--------------------|----------------|-----------|
| Test 1                          | $(70 / 4.67) = 15$ | 15+15+10+05+05 | 50        |
| Test 2 / Model                  | $(70 / 4.67) = 15$ |                |           |
| Assignment / Digital Assignment | 10                 |                |           |
| Seminar / Socratic Seminar      | 05                 |                |           |
| Group Task : GD, Role Play, APS | 05                 |                |           |

Maximum Marks: 50;      CIA Mark: 25

| Components                      |    | Calculation | CIA Total |
|---------------------------------|----|-------------|-----------|
| Test / Model                    | 10 | 10+5+5+5    | 25        |
| Assignment / Digital Assignment | 5  |             |           |
| Seminar / Socratic Seminar      | 5  |             |           |
| Group Task : GD, Role Play, APS | 5  |             |           |

**PRACTICAL**

**Maximum Marks: 50;    CIA Mark: 25**

| Components       |    | Calculation | CIA Total |
|------------------|----|-------------|-----------|
| Test / Model     | 15 | $15+5+5$    | 25        |
| Observation Note | 5  |             |           |
| Record           | 5  |             |           |

**Maximum Marks: 100;    CIA Mark: 50**

| Components       |    | Calculation | CIA Total |
|------------------|----|-------------|-----------|
| Test / Model     | 30 | $30+5+15$   | 50        |
| Observation Note | 5  |             |           |
| Record           | 15 |             |           |

**Maximum Marks: 200;    CIA Mark: 100**

| Components       |    | Calculation | CIA Total |
|------------------|----|-------------|-----------|
| Test / Model     | 60 | $60+10+30$  | 100       |
| Observation Note | 10 |             |           |
| Record           | 30 |             |           |

**PROJECT**

Maximum Marks: 100;      CIA Mark: 50

| Components        |    | Calculation | CIA Total |
|-------------------|----|-------------|-----------|
| Review I          | 10 | 10+10+10+20 | 50        |
| Review II         | 10 |             |           |
| Review III        | 10 |             |           |
| Report Submission | 20 |             |           |

Maximum Marks: 200;      CIA Mark: 100

| Components        |    | Calculation | CIA Total |
|-------------------|----|-------------|-----------|
| Review I          | 20 | 20+20+20+40 | 100       |
| Review II         | 20 |             |           |
| Review III        | 20 |             |           |
| Report Submission | 40 |             |           |

*\* Components for 'Review' may include the following:*

**Originality of Idea, Relevance to Current Trend, Candidate Involvement and Presentation of Report for Commerce, Management & Social Work.**

**Synopsis, System Planning, Design, Coding, Input form, Output format, Preparation of Report & Submission for Computer Science cluster.**

  
Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

  
K. SRINIVASAN, M.C.A.,  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

## STUDENT SEMINAR EVALUATION RUBRIC

Grading Scale:

|   |   |       |       |
|---|---|-------|-------|
| A | B | C     | D     |
| 5 | 4 | 2 - 3 | 0 - 1 |

| CRITERIA                                     | A - Excellent  | B - Good  | C - Average   | D - Inadequate  |
|--|--|---|---|---|
| <b>Organization of presentation</b>          | Information presented as interesting story in logical, easy to follow sequence   | Information presented in logical sequence; easy to follow   | Most of information presented in sequence   | Hard to follow; sequence of information jumpy   |
| <b>Knowledge of subject &amp; References</b> | Demonstrated full knowledge; answered all questions with elaboration & Material sufficient for clear understanding AND exceptionally presented | At ease; answered all questions but failed to elaborate & Material sufficient for clear understanding AND effectively presented | At ease with information; answered most questions & Material sufficient for clear understanding but not clearly presented | Does not have grasp of information; answered only rudimentary Questions & Material not clearly related to topic OR background dominated seminar |
| <b>Presentation Skills using ICT Tools</b>   | Uses graphics that explain and reinforce text and presentation   | Uses graphics that explain text and presentation  | Uses graphics that relate to text and presentation  | Uses graphics that rarely support text and presentation   |
| <b>Eye Contact</b>                           | Refers to slides to make points; engage with audience  | Refers to slides to make points; eye contact majority of time   | Refers to slides to make points; occasional eye contact   | Reads most slides; no or just occasional eye contact  |



|   |   |  |  |  |
|---|---|--|--|--|
| <b>Elocution –</b><br>(Ability to<br>speak English<br>language) | Correct, precise<br>pronunciation of<br>all terms<br>Voice is clear and<br>steady; audience<br>can hear well<br>at all<br>times | Incorrectly<br>pronounces<br>few terms<br>Voice is clear<br>with few<br>fluctuations;<br>audience<br>can<br>hear well<br>most<br>of the time | Incorrectly pronounces<br>some terms<br>Voice fluctuates from<br>low to clear; difficult<br>to hear at times | Mumbles<br>and/or<br>incorrectly<br>pronounces<br>some terms<br>Voice is low;<br>difficult to hear |
|---|---|--|--|--|

**WRITTEN ASSIGNMENT RUBRIC**

Grading Scale:

|          |          |          |          |          |
|----------|----------|----------|----------|----------|
| <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> | <b>F</b> |
| 09 - 10  | 07- 08   | 05 - 06  | 03 - 04  | 01 - 02  |

| <b>CRITERION</b>                      | <b>A - Excellent</b>   | <b>B - Good</b>  | <b>C - Average</b>   | <b>D - Below Average</b>   | <b>F - Inadequate</b>                  |
|---------------------------------------|--|--|--|--|--|
| <b>Content &amp; Focus</b>            | Hits on almost all content exceptionally clear   | Hits on most key points and writing is interesting   | Hits in basic content and writing is understandable  | Hits on a portion of content and/or digressions and errors   | Completely off track or did not submit |
| <b>Sentence Structure &amp; Style</b> | <ul style="list-style-type: none"> <li>* Word choice is rich and varies</li> <li>* Writing style is consistently strong</li> <li>* Students own formal language</li> </ul> | <ul style="list-style-type: none"> <li>* Word choice is clear and reasonably precise</li> <li>* Writing language is appropriate to topic</li> <li>* Words convey intended message</li> </ul> | <ul style="list-style-type: none"> <li>* Word choice is basic</li> <li>* Most writing language is appropriate to topic</li> <li>* Informal language</li> </ul> | <ul style="list-style-type: none"> <li>* Word choice is vague</li> <li>* Writing language is not appropriate to topic</li> <li>* Message is unclear</li> </ul> | * Not adequate                         |
| <b>Sources</b>                        | Sources are cited and are used critically  | Sources are cited and some are used critically   | Some sources are missing   | Sources are not cited  | Sources are not at all cited           |
| <b>Neatness</b>                       | Typed; Clean; Neatly bound in a report cover; illustrations provided   | Legible writing, well-formed characters; Clean and neatly bound in a report cover  | Legible writing, some ill-formed letters, print too small or too large; papers stapled together  | Illegible writing; loose pages   | Same as below standard                 |
| <b>Timeliness</b>                     | Report on time   | Report one class period late   | Report two class periods late  | Report more than one week late   | Report more than 10 days late          |

**Continuous Internal Assessment for Project**

**For Computer Science Cluster**

**Maximum Marks: 50 Marks**

| Criterion | Mode of Evaluation   | Marks | Total |
|-----------|--|-------|-------|
| I         | Synopsis, Company Profile, System Specification,<br>Existing System, Proposed System<br>OR<br>(For Android Developments)<br>Planning Stage         | 10    | 50    |
| II        | Supporting Diagrams like system flowchart, ER,<br>DFD, Usecase and Table Design<br>OR<br>UI and UX Design Application<br>Architect and Prototyping | 10    |       |
| III       | Coding, Input forms, Output format, Testing<br>OR<br>Development, Testing  | 10    |       |
| IV        | Preparation of Report & Submission   | 20    |       |

**External Assessment: 50 Marks**

| Mode of Evaluation                        | Marks | Total | Grand Total |
|---|-------|-------|-------------|
| <b>Project Report</b>                     |       |       | 50          |
| Title Relevance of the Industry/Institute | 05    | 30    |             |
| Technology                                | 05    |       |             |
| Design and development Publishing         | 10    |       |             |
| Testing, Report                           | 10    |       |             |
| <b>Viva Voce</b>                          |       |       | 20          |
| Project Presentation                      | 10    |       |             |
| Q&A Performance                           | 10    |       |             |

  
 Name and Signature of Principal  
 (Dr. R. Muthukumaran)  
**Dr. R. MUTHUKUMARAN,**  
 M.A., M. PHIL., B. Ed., Ph.D.  
**PRINCIPAL**  
 N.G.M. College, Pollachi - 642 311  
 Coimbatore District

  
 Name and Signature of Head of the Department  
 (Dr. M. Rajasenathipathi)  
**Dr. M. RAJASENATHIPATHI**  
 Head of the Department  
 Department of Computer Technology  
 N.G.M. College, Pollachi - 642 311  
 Coimbatore District

# SEMESTER- I

|  |          |                       |   |                                |  |             |  |
|--|----------|-----------------------|---|--------------------------------|--|-------------|--|
| Programme Code:                                | B.Sc.    |                       |   | Programme Title:               | Bachelor of Science<br>(Computer Technology) |             |  |
| Course Code:                                   | 21UCT101 |                       |   | Title                          | Batch:                                       | 2021 - 2024 |  |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 4        | Tutorial<br>Hrs./Sem. | - | CORE I:<br>PROGRAMMING<br>IN C | Semester:                                    | 1           |  |
|  |          |                       |   |                                | Credits:                                     | 4           |  |

### Course Objective

To focus on the language and syntax of C programming concepts.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | To remember data types, identifier, arrays, strings and pointers                          | K1              |
| CO2       | To understand how to write and use control statements and functions in C                  | K2              |
| CO3       | To implement the concept of pointers, structure and union                                 | K3              |
| CO4       | To evaluate string functions and file Operations in C programming for a given application | K4              |
| CO5       | To evaluate random file operations, preprocessor and command line arguments               | K5              |

### Mapping

| PO / PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO       |     |     |     |     |     |     |     |     |     |      |      |      |
| CO1      | H   | M   | M   | M   | L   | H   | M   | M   | M   | M    | M    | M    |
| CO2      | H   | L   | H   | M   | M   | M   | L   | M   | M   | M    | M    | M    |
| CO3      | H   | H   | M   | M   | L   | H   | H   | H   | L   | H    | M    | H    |
| CO4      | H   | M   | H   | H   | H   | M   | H   | H   | H   | H    | L    | H    |
| CO5      | M   | M   | L   | H   | M   | H   | M   | M   | M   | M    | H    | M    |

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

| Units           | Content  |
|-----------------|--|
| <b>Unit I</b>   | <p><b>Introduction to C</b> :Overview of C – History and Importance of C – Basic Structure of C programs -Development of program logic skills through Flowchart and Algorithm – Programming Style– Executing a 'C' program – Character set –C Tokens–Keywords – Identifiers – Constants– Variables – Rules for defining variables- Data types. – Declaring and initializing variables–Operators &amp; Expressions–Precedence of arithmetic –</p> |
|                 | <p>Type conversion in expressions– Mathematical functions – <b>Managing Input and output operations</b>: Introduction – Reading a character–Writing a character Formatted input-Formatted output Simple Programs</p>   |
| <b>Unit II</b>  | <p><b>Control Statements</b>: IF, IF..ELSE Statements, ELSE...IF ladder – Switch Statement – GOTO Statement – WHILE Statement – Do Statement – FOR Statement.-Jumps in loops. <b>Arrays</b>: One dimensional Arrays – Two Dimensional Arrays –simple Structures: Arrays within Structures–Union.</p>   |
| <b>Unit III</b> | <p><b>Functions</b>: User-defined functions- -Elements of user defined function, definition of function - Return value &amp;their types, function calls &amp;declarations-Category of functions: No arguments &amp; No return values-arguments that No return values – Arguments with return values-No arguments that return a value-Nesting of functions-Recursion</p>  |
| <b>Unit IV</b>  | <p><b>String manipulation</b>: Introduction- Declaring &amp; Initializing String variables –Reading string from terminal, Writing string to screen – String handling Functions.<br/><b>Pointers</b>: Introduction - Accessing, Declaring &amp; Initializing pointer Variables</p>  |
| <b>Unit V</b>   | <p><b>Files</b>: Defining and opening a file – Closing a file –I/O operations on sequential file- Command line arguments- Programs using Files and CommandLine Arguments</p>   |
|                 | <p><b>Total Contact Hrs</b> 60</p>   |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

## Text Book

| S.NO | AUTHOR         | TITLE OF THE BOOK     | PUBLISHERS \ EDITION                             | YEAR OF PUBLICATION |
|------|----------------|-----------------------|--|---------------------|
| 1    | E.Balagurusamy | Programming in Ansi C | Tata McGraw-Hill Publishing Co&Ltd.,SixthEdition | 2016                |

## Reference Books

| S.NO | AUTHOR                  | TITLE OF THE BOOK                         | PUBLISHERS \ EDITION | YEAR OF PUBLICATION |
|------|-------------------------|---|----------------------|---------------------|
| 1    | Greg Perry, Dean Miller | C Programming – Absolute Beginner's Guide | Third Edition        | 2013                |
| 2    | Yashvant Kanetkar       | Let us C                                  | 17th Edition         | 2020                |

## Web References

|  |
|--|
| 1. <a href="https://www.javatpoint.com/data-types-in-c">https://www.javatpoint.com/data-types-in-c</a>                               |
| 2. <a href="https://www.tutorialspoint.com/cprogramming/c_arrays.html">https://www.tutorialspoint.com/cprogramming/c_arrays.html</a> |
| 3. <a href="https://www.programiz.com/c-programming/c-functions">https://www.programiz.com/c-programming/c-functions</a>             |
| 4. <a href="https://www.programiz.com/c-programming/c-pointers">https://www.programiz.com/c-programming/c-pointers</a>               |
| 5. <a href="https://www.geeksforgeeks.org/basics-file-handling-c/">https://www.geeksforgeeks.org/basics-file-handling-c/</a>         |

| Course Designed by  | Verified by HOD  | Checked by  | Approved by  |
|---|--|---|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC  | COE  |
| Name:<br>Ms. K.S. Leelavathi<br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature: <br><b>K. SRINIVASAN, M.C.A.</b> | Name:<br>Dr. R. Manickachezian<br>Signature:  |

**Dr. M. RAJASENATHIPATHI** M.A., M.C.A., M.Phil., Ph.D.  
Head of the Department  
Department of Computer Technology  
Gounder Mahalingam College (Autonomous)  
POLLACHI - 642 001.

**K. SRINIVASAN, M.C.A.**  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN, M.Sc., M.S., P.**  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

|   |          |                               |   |  |  |             |
|---|----------|-------------------------------|---|--|--|-------------|
| <b>Programme Code:</b>                                  | B.Sc.    |                               |   | <b>Programme Title:</b>  | Bachelor of Science<br>(Computer Technology) |             |
| <b>Course Code:</b>                                     | 21UCT102 |                               |   | <b>Title</b>   | <b>Batch:</b>                                | 2021 - 2024 |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 4        | <b>Tutorial<br/>Hrs./Sem.</b> | - | <b>Title</b>   | <b>Semester:</b>                             | 1           |
|   |          |                               |   | CORE II: DIGITAL<br>FUNDAMENTALS<br>AND COMPUTER<br>ORGANIZATION | <b>Credits:</b>                              | 4           |

### Course Objective

To convert the knowledge on digital circuits, logic gates and about interfacing of various components.

To cover the various digital components used in the Organization and Hardware design of digital computers

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | To recollect number system, Binary Codes concepts  | K1              |
| CO2       | To understand the concepts of Boolean laws, logic gates, Karnaugh map for Minimization of POS and SOP form of Boolean expressions. | K2              |
| CO3       | To apply arithmetic and logic circuits, different sequential circuits with flipflops, registers.                                   | K3              |
| CO4       | To analyze the concept of Register Organization, Data Transfer and Manipulation, Registers and Memory Organization.                | K4              |
| CO5       | To evaluate memory hierarchy and types of memory   | K5              |



## Mapping

| PO<br>/PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO         |     |     |     |     |     |     |     |     |     |      |      |      |
| CO1        | H   | M   | H   | M   | L   | H   | M   | H   | H   | M    | M    | M    |
| CO2        | H   | L   | H   | M   | M   | M   | L   | M   | M   | M    | H    | M    |
| CO3        | H   | H   | L   | M   | L   | M   | H   | H   | L   | H    | M    | H    |
| CO4        | H   | L   | H   | H   | H   | M   | H   | M   | H   | H    | L    | H    |
| CO5        | M   | M   | L   | H   | M   | H   | M   | M   | M   | M    | H    | L    |

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

| Units    | Content  | Hrs       |
|----------|--|-----------|
| Unit I   | Number Systems and Binary Codes: Digital Electronics – Integrated circuits or Chip - Decimal System - Binary system – Octal System – Hexadecimal System – Binary addition – Binary Multiplication and Division – 1's Complement of a binary Number-9's Complement - 10's Complement -BCD– Gray Code - Excess-3 Code — Alphanumeric codes – Parity method for error detection and correction.       | 12        |
| Unit II  | Boolean Algebra-Logic Gates– Karnaugh Map and Minimization: Boolean Algebra – Gates – Inverter or NOT Gate – OR Gate – AND Gate – NOR Gate – NAND Gate – De Morgan's Theorems – Exclusive OR Gate – Exclusive NOR Gate – Karnaugh Map – Canonical Form I – Karnaugh Map - Construction and Properties – Minimization of SOP form using Karnaugh map - Minimization of POS form using Karnaugh map. | 12        |
| Unit III | Arithmetic and Logic circuits: Half Adder – Full Adder — Half- Subtractor – Full-Subtractor - Sequential Circuits, Flip-Flops: Flip-Flops- R-S Flip- Flops- Positive Edge Triggered J-K Flip-Flop- Registers: Register – Decoder – Encoder – Multiplexer – Demultiplexer.  | 12        |
| Unit IV  | Central Processing Unit: General Register Organization – Stack Organization – Instruction Formats – Data Transfer and Manipulation – Reduced Instruction Set Computer (RISC).  | 12        |
| Unit V   | Memory Organization: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory.   | 12        |
|          | <b>Total Contact Hrs</b>   | <b>60</b> |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

**Text Book**

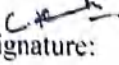
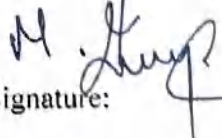


| S.NO | AUTHOR         | TITLE OF THE BOOK                        | PUBLISHERS \ EDITION   | YEAR OF PUBLICATION |
|------|----------------|--|--|---------------------|
| 1    | Puri.V.K       | Digital Electronics Circuits and Systems | 22 <sup>nd</sup> Reprint, TATA McGraw Hill Publications, ISBN-10: 0-07-463317-1. | 2011                |
| 2    | Morris Mano. M | Computer System Architecture             | 3 <sup>rd</sup> Edition  | 2013                |

**Reference Books**

| S.NO | AUTHOR   | TITLE OF THE BOOK                                | PUBLISHERS \ EDITION  | YEAR OF PUBLICATION |
|------|--|--|---|---------------------|
| 1    | Donald P Leach, Albert Paul Malvino, Gautam Saha | Digital Principles and Applications              | 7 <sup>th</sup> Edition, TATA McGraw-Hill Publications.                     | 2010                |
| 2    | Mandal S K                                       | Digital Electronics: Principles and Applications | 1 <sup>st</sup> Edition, ISBN-13:978-0070153820.                            | 2017                |
| 3    | Saini S.P.S                                      | Computer System Architecture and Organization    | S. K. Kataria & Sons Publication, ISBN-13:978-8189757731                    | 2015                |
| 4    | Hamacher.C, Zvonko.V, Zaky.S                     | Computer Organization                            | 5 <sup>th</sup> Edition Tata McGraw Hill Publication, ISBN-13:9781259005275 | 2017                |

## Web References

|  |
|--|
| 1. <a href="https://circuitglobe.com/number-system-in-digital-electronics.html">https://circuitglobe.com/number-system-in-digital-electronics.html</a>                               |
| 2. <a href="https://www.tutorialspoint.com/digital_circuits/digital_circuits_logic_gates.html">https://www.tutorialspoint.com/digital_circuits/digital_circuits_logic_gates.html</a> |
| 3. <a href="https://www.tutorialspoint.com/digital_circuits/digital_circuits_flip_flops.html">https://www.tutorialspoint.com/digital_circuits/digital_circuits_flip_flops.html</a>   |
| 4. <a href="https://www.tutorialspoint.com/computer_fundamentals/computer_cpu.htm">https://www.tutorialspoint.com/computer_fundamentals/computer_cpu.htm</a>                         |
| 5. <a href="https://www.tutorialsmate.com/2020/04/types-of-computer-memory.html">https://www.tutorialsmate.com/2020/04/types-of-computer-memory.html</a>                             |

| Course Designed by   | Verified by HOD  | Checked by   | Approved by  |
|--|--|--|--|
| Name and Signature   | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Ms. C. Keerthana<br><br>Signature:    | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:     | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |
| <b>Dr. M. RAJASENATHIPATHI</b> , M.A., M.C.A., M.Phil., Ph.D.<br>Head of the Department<br>Department of Computer Technology<br>Gounder Mahalingam College (Autonomous)<br>POLLACHI - 642 001. | <b>K. SRINIVASAN</b> , M.C.A.<br>Co-ordinator<br>Curriculum Development Cell (CDC)<br>NGM College (Autonomous)<br>Pollachi - 642 001.  | <b>Dr. R. MANICKACHEZIAN</b> , M.Sc., M.S., Ph.D.<br>Controller of Examinations<br>NGM College (Autonomous)<br>POLLACHI - 642 001. |  |

|  |          |                       |   |   |  |             |
|--|----------|-----------------------|---|---|--|-------------|
| Programme Code:                                | B.Sc.    |                       |   | Programme Title:  | Bachelor of Science<br>(Computer Technology) |             |
| Course Code:                                   | 21UCT1A1 |                       |   | Title   | Batch:                                       | 2021 - 2024 |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 5        | Tutorial<br>Hrs./Sem. | — | ALLIED I:<br>MATHEMATICS – I -<br>MATHEMATICAL<br>STRUCTURE FOR<br>COMPUTER SCIENCE | Semester:                                    | 1           |
|  |          |                       |   |   | Credits:                                     | 4           |

### Course Objective

To gain knowledge of the concepts of matrices, algebraic equations, numerical differentiation, integration and correlation for computer applications.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | To remember an in-depth knowledge in Matrices, Determinants, Inverse of a matrix, Rank of a Matrix and Eigen value Problems | K1              |
| CO2       | To understand the concepts of numerical differentiation and integration   | K2              |
| CO3       | To apply an appropriate numerical method for solving algebraic  | K3              |
| CO4       | To figure out the concept of Mean, Median, Mode, Measures of dispersion and the law relating to Correlation and Regression  | K4              |
| CO5       | To evaluate the concept of correlation and correlation evaluation regression  | K5              |

## Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | M   | M   | M   | L   | H   | M   | H   | H   | M    | M    | M    |
| CO2              | M   | H   | H   | M   | M   | M   | L   | M   | H   | H    | H    | M    |
| CO3              | H   | H   | L   | H   | L   | M   | H   | H   | L   | H    | L    | H    |
| CO4              | L   | L   | H   | H   | H   | M   | H   | M   | H   | H    | L    | H    |
| CO5              | M   | M   | L   | L   | M   | H   | M   | M   | H   | M    | H    | L    |

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

| Units    | Content  | Hrs       |
|----------|--|-----------|
| Unit I   | <b>Matrices</b> – Introduction – Determinants – Inverse of a matrix – Rank of a Matrix – EigenValue problems   | 15        |
| Unit II  | <b>System of Simultaneous Linear algebraic Equation:</b> Gauss elimination, Gauss Jordan. <b>The solution of Numerical Algebraic and Transcendental equation</b> – Bisection method – Newton Raphson method.   | 15        |
| Unit III | <b>Numerical Differentiation:</b> Newton's forward Difference - Backward Difference – <b>Startling formula Numerical Integration:</b> Trapezoidal Rule and Simpson's rule - <b>Numerical solution of ordinary differential equations:</b> Taylor method.   | 15        |
| Unit IV  | <b>Measures of central tendency:</b> Mean (Individual Series), Median Discrete Series) and Mode (Continuous Series) – Relationship among mean, median and mode. Case study: Calculate mean, median and mode for students mark list. <b>Measures of dispersion:</b> Range, quartile deviation, mean deviation and Standard deviation. | 15        |
| Unit V   | <b>Correlation:</b> Karl Pearson's coefficient of correlation – <b>Rank correlation regression:</b> Regression Equations – Difference between Correlation and Regression.  | 15        |
|          | <b>Total Contact Hrs</b>   | <b>75</b> |

2024  
Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

| S.NO | AUTHOR  | TITLE OF THE BOOK       | PUBLISHERS \ EDITION  | YEAR OF PUBLICATION |
|------|---|-------------------------|---|---------------------|
| 1    | Dr. Venkataraman, M. K                          | Engineering Mathematics | Volume II, Third Edition, NPC - (Unit).                                       | 2001                |
| 2    | Kandasamy.P,<br>Thilagavathi.K,<br>Gunavathi. K | Numerical Methods       | Revised Edition, New Delhi, S. Chand and Company Ltd, ISBN-13: 9788121914383. | 2006                |
| 3    | Pillai.R.S.N, Bagavathi.V                       | Statistical Methods     | New Delhi, Sultan Chand and Sons Company Limited, (Unit IV &V).               | 2005                |

Reference Books

| S.NO | AUTHOR                        | TITLE OF THE BOOK                      | PUBLISHERS \ EDITION   | YEAR OF PUBLICATION |
|------|-------------------------------|--|--|---------------------|
| 1    | N. P. Bali., Dr. Manish Goyal | A text book of Engineering Mathematics | Vol1,<br>9th edition,<br>University science Press, New Delhi. ISBN- 9788131808320. | 2010                |
| 2    | Gupta .S.C,<br>Kapoor .V.K    | Fundamental of Mathematical Statistics | Sultan Chand and Sons-Tb,ISBN-13:9788180549687.                                    | 2015                |

## Web references:

1. <https://www.vedantu.com/maths/types-of-matrices>
2. <https://byjus.com/maths/gauss-elimination-method/>
3. <http://www.math.pitt.edu/~sparling/052/23052/23052notes/23052notestojan14th/node3.html>
4. <https://statistics.laerd.com/statistical-guides/measure-central-tendency-mean-mode-median.php>
5. <https://www.bmj.com/about-bmj/resources-readers/publications/statistics-square-one/11-correlation-and-regression>

| Course Designed by  | Verified by HOD   | Checked by  | Approved by   |
|---|---|---|---|
| Name and Signature  | Name and Signature  | Co-ordinator CDC  | COE   |
| Name:<br>Ms. A. Kalaivani<br><br>Signature: | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature: | Name:<br>Mr. K. Srinivasan<br><br>Signature: | Name:<br>Dr. R. Manickachezian<br><br>Signature: |

**Dr. M. RAJASENATHIPATHI** M.A., M.C.A., M.P.M., Ph.D.  
Head of the Department  
Department of Computer Technology  
Nallamuthu Gowder Mahalingam College (Autonomous)  
POLLACHI - 642 001.

**K. SRINIVASAN**, M.C.A.,  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN**, M.Sc., M.S., Ph.D.  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

|  |          |                       |                                  |  |
|--|----------|-----------------------|----------------------------------|--|
| Programme Code:                                | B.Sc.    |                       | Programme Title:                 | Bachelor of Science<br>(Computer Technology) |
| Course Code:                                   | 21UCT103 |                       | Title                            | Batch: 2021 - 2024                           |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 4        | Tutorial<br>Hrs./Sem. | LAB - I -<br>PROGRAMMING IN<br>C | Semester: 1                                  |
|  |          |                       |                                  | Credits: 2                                   |

### Course Objective

On successful completion of this subject the students will be able to enhance their analyzing and problem solving skills and use the same for writing programs in C.

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | To remember the concept of data types, decision making and looping control statements      | K1              |
| CO2       | To get the idea of array, strings and functions in C                                       | K2              |
| CO3       | To access the file information through open/close and reading/writing operations in a file | K3              |
| CO4       | To remember the concept of pointers  | K4              |
| CO5       | To get the idea of file functions  | K5              |



## Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | M   | M   | M   | L   | H   | M   | H   | H   | M    | H    | M    |
| CO2              | M   | M   | H   | L   | M   | M   | L   | H   | H   | H    | H    | M    |
| CO3              | H   | H   | L   | H   | H   | M   | H   | H   | L   | H    | L    | H    |
| CO4              | L   | H   | H   | H   | H   | H   | H   | M   | H   | H    | L    | H    |
| CO5              | M   | M   | L   | L   | M   | H   | M   | L   | H   | M    | H    | L    |

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

| Content   | Hrs       |
|---|-----------|
| <p><b>Sample Programs</b></p> <ol style="list-style-type: none"> <li>1. Write a C program to illustrate the concept of operators in C.</li> <li>2. Write a C program to illustrate the concept of conditional and unconditional control statements.</li> <li>3. Write a C program to illustrate the concept of Arrays.</li> <li>4. Write a C program to illustrate the concept of string and its functions.</li> <li>5. Write a C program to illustrate the concept of Functions.</li> <li>6. Write a C program to illustrate the concept of call by value.</li> <li>7. Write a C program to illustrate the concept of call by reference.</li> <li>8. Write a C program to illustrate the concept of pointers.</li> <li>9. Write a C program to illustrate the concept of File and its Operations.</li> <li>10. Write a C program to illustrate the concept of Command line Arguments.</li> </ol> | 60        |
| <b>Total Contact Hrs</b>  | <b>60</b> |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

| Course Designed by  | Verified by HOD  | Checked by  | Approved by  |
|---|--|---|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC  | COE  |
| Name:<br>Ms. K.S Leelavathi<br><br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

**Dr. M. RAJASENATHIPATHI** M.A., M.C.A., M.Phil., Ph.D.  
 Head of the Department  
 Department of Computer Technology  
 Mahalingam College (Autonomous)  
**POLLACHI - 642 001.**

**K. SRINIVASAN, M.C.A.**  
 Co-ordinator  
 Curriculum Development Cell (CDC)  
 NGM College (Autonomous)  
 Pollachi - 642-001.

**Dr. R. MANICKACHEZIAN, M.Sc., M.S.**  
 Controller of Examinations  
 NGM College (Autonomous)  
 POLLACHI - 642 001.

# SEMESTER- II

|  |          |                       |   |   |  |             |  |
|--|----------|-----------------------|---|---|--|-------------|--|
| Programme Code:                                | B.Sc.    |                       |   | Programme Title:  | Bachelor of Science<br>(Computer Technology) |             |  |
| Course Code:                                   | 21UCT204 |                       |   | Title   | Batch:                                       | 2021 - 2024 |  |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 4        | Tutorial<br>Hrs./Sem. | - | CORE III: OBJECT<br>ORIENTED<br>PROGRAMMING<br>WITH C++ | Semester:                                    | II          |  |
|  |          |                       |   |   | Credits:                                     | 4           |  |

### Course Objective

To provide in-depth coverage of object-oriented programming principles and techniques in C++.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | To recollect keywords, tokens, data types, oops concepts and control structures in C++  | K1              |
| CO2       | To understand the design issues involved with variable allocation and binding, functions, classes and objects                                   | K2              |
| CO3       | To apply features of object oriented programming to solve real world problems using constructors, destructors and operator overloading concepts | K3              |
| CO4       | To interpret the concepts of pointers, managing console I/O operators and file operations in C++  | K4              |
| CO5       | To evaluate the concepts of file open modes, file pointers and their manipulators   | K5              |

### Mapping

| PO /PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1           | H   | M   | H   | M   | L   | H   | M   | H   | H   | M    | M    | M    |
| CO2           | M   | M   | H   | L   | MH  | M   | L   | H   | H   | H    | H    | M    |
| CO3           | H   | H   | L   | H   | H   | M   | H   | M   | L   | H    | L    | H    |
| CO4           | L   | H   | M   | H   | H   | H   | H   | M   | H   | H    | L    | H    |
| CO5           | M   | M   | L   | L   | M   | H   | M   | L   | H   | M    | H    | M    |

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

| Units    | Content   | Hrs |
|----------|---|-----|
| Unit I   | Principles of Object-Oriented Programming: Procedure-Oriented Programming – Object- Oriented Programming Paradigm – Basic Concepts of OOP – Benefits of OOP, Beginning with C++: Structure of C++ program. Tokens, Expressions and Control structures : Tokens – Keywords – Identifiers - Data types – Declaration of Variables – Dynamic Initialization of Variables – Reference Variables – Operators – Scope Resolution Operator – Expressions - Operator Precedence – Control Structures. | 11  |
| Unit II  | Functions in C++: The Main ()-Function – Function Prototype – Call by Reference – Return by Reference - Inline Functions – Default Arguments – Function Overloading – Friend and Virtual Functions. Classes and Objects; Specifying Class – Defining Member Functions – Private Member Functions – Array with a Class – Static Data Members – Static Member Functions – Array of Objects – Objects as Function Arguments – Returning Objects – Const Member Functions.                        | 12  |
| Unit III | <b>Constructors and Destructors:</b> Constructors – Parameterized Constructors – Multiple Constructors in a class – Copy Constructors - Dynamic Constructors – Destructors. <b>Operator Overloading and Type Conversion:</b> Defining Operator Overloading Function – Overloading Unary Operators – Overloading Binary Operators – Overloading Operators with Friend Functions – Rules for Overloading Operators.   | 12  |
| Unit IV  | <b>Inheritance:</b> Defining Derived Classes – Types of Inheritance – Virtual Base Classes – Abstract Classes – Nesting of Classes. <b>Pointers, Virtual Functions and Polymorphism:</b> Pointers to Objects – this Pointer – Pointers to Derived Classes – Virtual Function - Pure Virtual Functions.  | 12  |
| Unit V   | Managing Console I/O Operators: C++ Streams – Stream Classes – Unformatted I/O Operator – Formatted Console I/O Operations. Working with Files: Classes for File Stream Operations – Opening and Closing a File – Detecting end-of-File - File Open Modes – File Pointers and Their Manipulators.   | 12  |
|          | <b>Total Contact Hrs</b>  | 60  |

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book


| S.NO | AUTHOR          | TITLE OF THE BOOK                    | PUBLISHERS \ EDITION   | YEAR OF PUBLICATION |
|------|-----------------|--------------------------------------|--|---------------------|
| 1    | BalaGurusamy .E | Object Oriented Programming with C++ | 6 <sup>th</sup> edition TMH Publication, ISBN-13: 9781259029936. | 2013                |

Reference Books

| S.NO | AUTHOR             | TITLE OF THE BOOK            | PUBLISHERS \ EDITION                            | YEAR OF PUBLICATION |
|------|--------------------|------------------------------|---|---------------------|
| 1    | Kyle Loudan        | C++ - The Complete Reference | 4 <sup>th</sup> Edition                         | 2017                |
| 2    | Yashavant Kanetkar | Let us C++                   | -   | 2020                |
| 3    | John R Hubbard     | Programming with C++         | 3 <sup>rd</sup> Edition, MH Publication         | 2009                |
| 4    | Bhushan Trivedi    | Programming with Ansi C++    | Oxford University Press, ISBN-13:9780198063087. | 2010                |

Web references:

- <https://www.tutorialspoint.com/basic-concepts-of-object-oriented-programming-using-cplusplus>
- <https://www.geeksforgeeks.org/classes-objects-java/#:~:text=Classes%20and%20Objects%20are%20basic,around%20the%20real%20life%20entities.>
- [https://www.tutorialspoint.com/cplusplus/cpp\\_constructor\\_destructor.htm](https://www.tutorialspoint.com/cplusplus/cpp_constructor_destructor.htm)
- <https://www.geeksforgeeks.org/inheritance-in-c/>
- <https://www.w3schools.in/cplusplus-tutorial/working-with-files>

| Course Designed by   | Verified by HOD  | Checked by   | Approved by  |
|--|--|--|--|
| Name and Signature   | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Dr. R. Rajasenathipathi   | Name:<br>Dr. R. Rajasenathipathi   | Name:<br>Mr. K. Srinivasan   | Name:<br>Dr. R. Manickachezian   |
| Signature:  | Signature:  | Signature: <br><b>K. SRINIVASAN, M.C.A.,</b> | Signature:  |

**Dr. RAJASENATHIPATHI** M.A., M.C.A., M.Phil., Ph.D.  
Head of the Department  
Department of Computer Technology  
Sri Ramakrishna Mission Mahalingam College (Autonomous)  
POLLACHI - 642 001.

**K. SRINIVASAN, M.C.A.,**  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.**  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

|  |          |                       |                               |  |             |
|--|----------|-----------------------|-------------------------------|--|-------------|
| Programme Code:                                | B.Sc.    |                       | Programme Title:              | Bachelor of Science<br>(Computer Technology) |             |
| Course Code:                                   | 21UCT205 |                       | Title                         | Batch:                                       | 2021 – 2024 |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 4        | Tutorial<br>Hrs./Sem. | CORE IV:<br>DATA<br>STRUCTRES | Semester:                                    | II          |
|  |          |                       |                               | Credits:                                     | 4           |

### Course Objective

To understand the concepts of array, stack, queue, list, linked list, tree and their computer applications.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | To remember arrays, stack/queue operations and trees                                    | K1              |
| CO2       | To understand and develop skills to analyze simple linear and non linear datastructures | K2              |
| CO3       | To apply the concept of linked lists, graphs and trees for the realworldproblems -      | K3              |
| CO4       | To evaluate file organizations, various searching and sorting methodologies             | K4              |
| CO5       | To apply the concept of Binary trees  | K5              |

### Mapping

| PO /PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO      |     |     |     |     |     |     |     |     |     |      |      |      |
| CO1     | H   | M   | H   | M   | L   | H   | M   | H   | H   | M    | M    | M    |
| CO2     | M   | H   | H   | L   | H   | M   | L   | H   | H   | M    | H    | M    |
| CO3     | H   | H   | L   | H   | H   | L   | H   | M   | L   | H    | L    | H    |
| CO4     | L   | H   | M   | H   | H   | H   | H   | M   | H   | H    | M    | H    |
| CO5     | M   | M   | L   | L   | M   | H   | M   | L   | H   | M    | H    | M    |

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



| Units    | Content  |
|----------|--|
| Unit I   | <b>Introduction</b> - Definition – Structure and properties of Algorithms – Development of an Algorithm – Data structures and Algorithms – Data structure – Definition and Classification. <b>Arrays:</b> introduction – Array Operations - Number of elements in an array. representation of Arrays in memory, Applications |
| Unit II  | Stacks: Introduction – Stack Operations- – Applications .Queues: Circular Queues – Other types of Queues – Applications.   |
| Unit III | Linked Lists: Introduction – Singly Linked Lists – Circular Linked Lists – Doubly Linked Lists – Applications.   |
| Unit IV  | Trees: Introduction – Trees – Basic Terminologies - Representation of Trees. Binary Trees: Basic Terminologies and Types - Representation of Binary Trees - Binary Tree Traversals – Applications. Graphs: Introduction – Definition and basic Terminologies.  |
| Unit V   | File Organizations: Introduction – Files - Keys – Basic File Operations – Sequential File Organizations – Indexed sequential File Organizations – Direct File Organizations. Searching: Linear search– Binary search. Sorting: Merge sort and Quick sort.  |
|          | <b>Total Contact Hrs</b>   |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

## Text Book

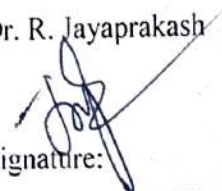
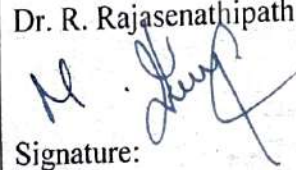
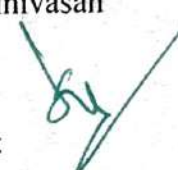

| S.NO | AUTHOR  | TITLE OF THE BOOK  | PUBLISHERS \ EDITION         | YEAR OF PUBLICATION |
|------|---------|--|------------------------------|---------------------|
| 1    | GAV Pai | Data Structures and Algorithms – Concepts, Techniques and Applications | Tata MCGrawHill Publications | 2011                |

## Reference Books

| S.NO | AUTHOR  | TITLE OF THE BOOK               | PUBLISHERS \ EDITION  | YEAR OF PUBLICATION |
|------|---|---------------------------------|---|---------------------|
| 1    | Aaron M Tanenbaum, Yedidye Langsam, Moshe J Augenstein, | Data Structure using C          | Facsimile Edition, Pearson India, ISBN-13:978-8131702291.               | 2018                |
| 2    | Ashok N Kamthane  | Programming and Data Structures | Pearson Education, 1 <sup>st</sup> Indian Print, ISBN-13:978-131724224. | 2009                |

## Web references:

|  |
|--|
| 1. <a href="https://www.w3schools.in/cplusplus-tutorial/working-with-files/">https://www.w3schools.in/cplusplus-tutorial/working-with-files/</a> |
| 2. <a href="https://www.javatpoint.com/ds-stack-vs-queue">https://www.javatpoint.com/ds-stack-vs-queue</a>                                       |
| 3. <a href="https://www.javatpoint.com/ds-linked-list">https://www.javatpoint.com/ds-linked-list</a>   |
| 4. <a href="https://www.javatpoint.com/binary-tree">https://www.javatpoint.com/binary-tree</a>   |
| 5. <a href="https://www.javatpoint.com/bubble-sort">https://www.javatpoint.com/bubble-sort</a>   |

| Course Designed by  | Verified by HOD  | Checked by  | Approved by  |
|---|--|---|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC  | COE  |
| Name:<br>Dr. R. Jayaprakash<br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature:  | Name:<br>Dr. R. Manickachezian<br>Signature:  |

**Dr. M. RAJASENATHIPATHI** MA, MCA, M.Phil, Ph.D.  
 Head of the Department  
 Department of Computer Technology  
 Nallamuthu Gowder Mahalingam College (Autonomous)  
 POLLACHI - 642 001.

**K. SRINIVASAN, MCA**  
 Co-ordinator  
 Curriculum Development Cell  
 NGM College (Autonomous)  
 Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN, M.Sc., M.S.P.**  
 Controller of Examinations  
 NGM College (Autonomous)  
 POLLACHI - 642 001.

|  |          |                       |   |                                 |  |             |  |
|--|----------|-----------------------|---|---------------------------------|--|-------------|--|
| Programme:   | B.Sc.    |                       |   | Programme Title:                | Bachelor of Science<br>(Computer Technology) |             |  |
| Course Code:   | 21UCT2A2 |                       |   | Title                           | Batch:                                       | 2021 - 2024 |  |
| Lecture<br>Hrs./Week<br>or<br>Practical<br>Hrs./Week | 4        | Tutorial<br>Hrs./Sem. | - | ALLIEDII:<br>MATHEMATICS – II - | Semester:                                    | II          |  |
|  |          |                       |   | OPERATIONS<br>RESEARCH          | Credits:                                     | 4           |  |

### Course Objective

Every industrial organization faces multifaceted problems to identify best possible solution to their problems. OR aims to help the executives to obtain optimal solution with the use of OR techniques and to locate best or optimal solution.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | To recollect the modeling tools and computational tools as well as analytic skills to evaluate the problems.  | K1              |
| CO2       | To understand how to translate real world problem given in words into a mathematical formulation.   | K2              |
| CO3       | To apply mathematical optimization techniques, existing optimization tool kits to write computer programs and to implement algorithms and solve problems. | K3              |
| CO4       | To analyze the problem situation leading to better control, better co-ordination, better systems and finally better decisions.                            | K4              |
| CO5       | To analyze the concept of CPM and PERT  | K5              |

### Mapping

| PO /PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO      |     |     |     |     |     |     |     |     |     |      |      |      |
| CO1     | H   | M   | H   | M   | L   | H   | M   | H   | H   | M    | M    | H    |
| CO2     | M   | M   | H   | L   | MH  | M   | L   | H   | H   | H    | H    | M    |
| CO3     | H   | H   | L   | H   | H   | M   | H   | M   | L   | H    | L    | H    |
| CO4     | L   | H   | M   | H   | H   | H   | H   | M   | H   | H    | L    | L    |
| CO5     | M   | M   | L   | L   | M   | H   | M   | L   | H   | M    | H    | M    |

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

| Units                    | Content   | Hrs       |
|--------------------------|---|-----------|
| Unit I                   | Linear Programming Problem: Graphical Solution Method- General Linear Programming Problem (Definition alone) - Canonical and Standard forms of LPP. Simplex Method: Basic Solution and Degenerate Solutions to Linear Equation- Simplex Method. | 12        |
| Unit II                  | <del>Transportation Problem: North West Corner Method- Least Cost Method-</del><br>Vogel's Approximation Method- Moving towards optimality UV Method. Assignment Problem: Definition- Assignment Algorithm.                                     | 12        |
| Unit III                 | Inventory Control: Introduction – Types of Inventory – Inventory Decision- Economical Order Quantity (EOQ) - Deterministic Inventory Problems.  | 12        |
| Unit IV                  | Sequencing Problems: Introduction- Problems with n Jobs and 2 Machines- Problems with n Jobs and k Machines.  | 12        |
| Unit V                   | Network Scheduling: Introduction- Network and Basic Components- Rules of Network Construction- Time calculation in Networks-CPM-PERT- PERT Calculations- Difference between CPM and Pert Network.   | 12        |
| <b>Total Contact Hrs</b> |   | <b>60</b> |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

**Text Book**


| S.NO | AUTHOR                            | TITLE OF THE BOOK   | PUBLISHERS \ EDITION                 | YEAR OF PUBLICATION |
|------|-----------------------------------|---------------------|--------------------------------------|---------------------|
| 1    | KantiSwarup, P.K.Gupta, Man Mohan | Operations Research | Sultan Chand & Sons, Seventh Edition | 1996                |

## Reference Books

| S.NO | AUTHOR           | TITLE OF THE BOOK  | PUBLISHERS \ EDITION                           | YEAR OF PUBLICATION |
|------|------------------|--------------------|--|---------------------|
| 1    | R. Paner Selvam, | Operation Research | Prentice Hall of India Pvt Ltd, second edition | -                   |

## Web references:

- <https://ncert.nic.in/ncerts/l/lemh206.pdf>
- <https://www.mygreatlearning.com/blog/transportation-problem-explained/>
- [https://www.researchgate.net/publication/245280760\\_Deterministic\\_Inventory\\_Models\\_for\\_Variable\\_Production](https://www.researchgate.net/publication/245280760_Deterministic_Inventory_Models_for_Variable_Production)
- [https://link.springer.com/chapter/10.1007%2F978-3-662-08011-5\\_10](https://link.springer.com/chapter/10.1007%2F978-3-662-08011-5_10)
- [https://en.wikipedia.org/wiki/Network\\_congestion](https://en.wikipedia.org/wiki/Network_congestion)

| Course Designed by  | Verified by HOD   | Checked by   | Approved by  |
|---|---|--|--|
| Name and Signature  | Name and Signature  | Co-ordinator CDC   | COE  |
| Name:<br>MS. K. S. Leelavathi<br>Signature:   | Name:<br>Dr. R. Rajasenathipathi<br>Signature:     | Name:<br>Mr. K. Srinivasan<br>Signature:        | Name:<br>Dr. R. Manickachezian<br>Signature:  |
| <b>Dr. M. RAJASENATHIPATHI</b> , M.A., M.C.A., M.Phil., Ph.D.<br>Head of the Department<br>Department of Computer Technology<br>NGM College (Autonomous)<br>Pollachi - 642 001. | <b>K. SRINIVASAN</b> , M.C.A.<br>Co-ordinator<br>Curriculum Development Cell (CDC)<br>NGM College (Autonomous)<br>Pollachi - 642 001. | <b>Dr. R. MANICKACHEZIAN</b> , M.Sc., M.S., Ph.D.<br>Controller of Examinations<br>NGM College (Autonomous)<br>POLLACHI - 642 001. |  |

|   |          |                       |                  |  |  |  |  |             |    |
|---|----------|-----------------------|------------------|--|--|--|--|-------------|----|
| Programme Code:                                   | B.Sc.    |                       | Programme Title: |  |  |  | Bachelor of Science<br>(Computer Technology) |             |    |
| Course Code:                                      | 21UCT206 |                       | Title            |  |  |  | Batch:                                       | 2021 - 2024 |    |
| Lecture Hrs./Week<br>or<br>Practical<br>Hrs./Week | 4        | Tutorial<br>Hrs./Sem. | -                | LAB - II:<br>PROGRAMMING IN<br>C++ WITH DATA<br>STRUCTURES |  |  |  | Semester:   | II |
|   |          |                       |                  |  |  |  | Credits:                                     | 2           |    |

**Course Objective**

To develop the programming ability in C++ by knowing the OOPS concepts like Encapsulation, Abstraction, Inheritance, Polymorphism, Exception handling.

**Course Outcomes**

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | To recollect the structure of the C++ programming language  | K1              |
| CO2       | To understand how to implement copy constructors and class member concept of data abstraction and encapsulation and to overload functions and operators in C++. | K2              |
| CO3       | To access how inheritance promote code reuse, how virtual functions implement dynamic binding with polymorphism.  | K3              |
| CO4       | To access how to design and implement generic classes with C++ templates and how to use exception handling in C++ programs.                                     | K4              |
| CO5       | To understand about command line arguments and function templates   | K5              |

**Mapping**

| PO / PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1      | H   | H   | H   | M   | L   | H   | M   | M   | H   | M    | M    | H    |
| CO2      | M   | H   | H   | L   | H   | M   | L   | H   | H   | M    | H    | M    |
| CO3      | H   | H   | L   | H   | H   | L   | H   | M   | L   | H    | L    | H    |
| CO4      | L   | H   | M   | M   | H   | H   | H   | M   | H   | H    | M    | H    |
| CO5      | M   | M   | L   | L   | M   | H   | M   | L   | H   | M    | H    | M    |

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

| Content  | Hrs |
|--|-----|
| <b>Sample Programs</b> <ol style="list-style-type: none"> <li>1. Write a C++ program to illustrate the concept of operators and Expressions.</li> <li>2. Write a C++ program to illustrate the concept of Functions in C++.</li> <li>3. Write a C++ program to illustrate the concept of Function Overloading.</li> <li>4. Write a C++ program to illustrate the concept of Classes and objects.</li> <li>5. Write a C++ program to illustrate the concept of Constructors.</li> <li>6. Write a C++ program to illustrate the concept of Destructors.</li> <li>7. Write a C++ program to illustrate the concept of Overloading unary and binary Operators.</li> <li>8. Write a C++ program to illustrate the concept of Inheritance.</li> <li>9. Write a C++ program to illustrate the concept of Files and File stream operations</li> <li>10. Write a C++ program to illustrate the concept of File pointers.</li> </ol> | 60  |
| <b>Total Contact Hours</b>   | 60  |

## Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

## Assessment Methods

Seminar, Quiz, Assignments, Group Task.

| Course Designed by  | Verified by HOD  | Checked by   | Approved by   |
|---|--|--|---|
| Name and Signature  | Name and Signature   | Co-ordinator CDC   | COE   |
| Name:<br>Dr. R. Rajasenathipathi<br>Signature:    | Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature:    | Name:<br>Dr. R. Manickachezian<br>Signature: <br>Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D. |
| Dr. M. RAJASENATHIPATHI, M.A., M.C.A., M.P.H., Ph.D.<br>Head of the Department<br>Department of Computer Technology<br>Nallamuthu Govender Mahalingam College (Autonomous)<br>POLLACHI - 642 001. | 29<br>Co-ordinator<br>Curriculum Development Cell (CDC)<br>NGM College (Autonomous)<br>Pollachi - 642 001.                         | K. SRINIVASAN, M.C.A.,<br>Co-ordinator<br>Curriculum Development Cell (CDC)<br>NGM College (Autonomous)<br>Pollachi - 642 001. | Controller of Examinations<br>NGM College (Autonomous)<br>POLLACHI - 642 001.   |



# SEMESTER- III

|  |          |                       |    |                             |  |             |  |
|--|----------|-----------------------|----|-----------------------------|--|-------------|--|
| Programme Code:                                | B.Sc. CT |                       |    | Programme Title:            | Bachelor of Science<br>(Computer Technology) |             |  |
| Course Code:                                   | 21UCT307 |                       |    | Title                       | Batch:                                       | 2021 – 2024 |  |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 05       | Tutorial<br>Hrs./Sem. | 06 | CORE V: JAVA<br>PROGRAMMING | Semester:                                    | III         |  |
|  |          |                       |    |                             | Credits:                                     | 04          |  |

### Course Objective

To provide profound coverage on classes, multithreading, exception handling, applets and file handling in Java.

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Remember about classes, objects, members of a class and relationships among them needed for a specific problem | K1              |
| CO2       | Comprehend the concepts of inheritance, interface and package  | K2              |
| CO3       | Examine error handling techniques using exception handling   | K3              |
| CO4       | Evaluate the concepts of thread, applet and files  | K4              |
| CO5       | Developed skills in designing abstract window toolkit  | K5              |

### Mapping

| PO/PSO<br>CO | PO 1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|--------------|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1          | H    | H   | H   | H   | H   | H   | H   | H   | L   | H    | H    | H    |
| CO2          | H    | M   | H   | M   | H   | H   | M   | H   | M   | H    | M    | L    |
| CO3          | H    | M   | H   | M   | H   | L   | M   | H   | M   | H    | M    | H    |
| CO4          | M    | H   | L   | H   | M   | M   | H   | M   | H   | M    | H    | M    |
| CO5          | H    | L   | H   | M   | H   | H   | M   | H   | M   | L    | M    | H    |

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

| Units    | Content  | Hrs |
|----------|--|-----|
| Unit I   | <b>Java Evolution</b> – History Features and How Java differs from C and C++, Java support systems, Java environment – Overview of Java Language – Constants, Variables and Data Types - Operators and Expressions– Decision Making and Branching.   | 15  |
| Unit II  | Classes, Objects and Methods– Arrays, Strings and Vectors – Interfaces: Multiple Inheritances – Packages: Putting Classes Together.  | 15  |
| Unit III | <b>Multithreaded Programming:</b> Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions. <b>Managing Errors and Exceptions:</b> Types of Errors – Exceptions – Syntax of Exception Handling Code.   | 15  |
| Unit IV  | <b>Applet Programming:</b> How Applets Differ From Applications – Preparing to Write Applets – Building Applet Code – Applet Life Cycle – Creating an Executable Applet – Applet Tag – Adding Applet to HTML File – Running the Applet – Passing Parameters to Applets – Aligning the Display– Displaying Numerical Values – Getting Input From the User - Event Handling. <b>Graphics Programming</b> –The Graphics Class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs. | 15  |
| Unit V   | <b>Managing Input / Output Files in Java:</b> Concept of Streams – Stream Classes – Byte Stream Classes – Serialization – Character Stream Classes – Using Streams – Other Useful I/O Classes – Using the File Class – Creation of Files – Reading / Writing Characters –Handling Primitive Data Types – Concatenating and Buffering Files .   | 15  |
|          | <b>Total Contact Hrs</b>   | 75  |

### Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

### Assessment Methods

Seminar, Quiz, Assignments, Group Task.

## Text Book

| S.NO | AUTHOR          | TITLE OF THE BOOK              | PUBLISHERS \ EDITION  | YEAR OF PUBLICATION |
|------|-----------------|--------------------------------|---|---------------------|
| 1    | Balagurusamy. E | Programming With JAVA A Primer | 6 <sup>th</sup> Edition, Tata McGraw Hill Publications, ISBN-13: 9780070141698. | 2019                |

## Reference Books

| S.NO | AUTHOR          | TITLE OF THE BOOK                                   | PUBLISHERS \ EDITION   | YEAR OF PUBLICATION |
|------|-----------------|---|--|---------------------|
| 1    | John R. Hubbard | Programming with Java                               | 2 <sup>nd</sup> Edition, Schaum's Outline Series, Tata McGraw Hill Publications, ISBN-13: 9780070589421. | 2013                |
| 2    | Timothy Budd    | Understanding Object Oriented Programming with Java | 2 <sup>nd</sup> Edition, Pearson Education, ISBN-13: 9780201308815.                                      | 2016                |
| 3    | Deitel&Deitel   | Java TM: How to Program                             | 9 <sup>th</sup> Edition, PHI, ISBN-13: 9780136123712   | 2010                |

## Web References

|  |
|--|
| 1. <a href="http://iiti.ac.in/people/~tanimad/JavaTheCompleteReference.pdf">iiti.ac.in/people/~tanimad/JavaTheCompleteReference.pdf</a>            |
| 2. <a href="http://www.onlineprogrammingbooks.com/learning-java-4th-edition/">http://www.onlineprogrammingbooks.com/learning-java-4th-edition/</a> |
| 3. <a href="https://www.javatpoint.com/serialization-in-java">https://www.javatpoint.com/serialization-in-java</a>                                 |
| 4. <a href="https://www.journaldev.com/2452/serialization-in-java">https://www.journaldev.com/2452/serialization-in-java</a>                       |
| 5. <a href="https://www.tutorialspoint.com/java/index.htm">https://www.tutorialspoint.com/java/index.htm</a>                                       |

| Course Designed by  | Verified by HOD  | Checked by  | Approved by  |
|---|--|---|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC  | COE  |
| Name:<br>Ms. C. Keerthana<br><br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

**Dr. M. RAJASENATHIPATHI** M.A., M.C.A., M.P.H.E.P.D.  
 Head of the Department  
 Department of Computer Technology  
 Nallamurthi Gounder Mahalingam College (Autonomous)  
 POLLACHI - 642 001.

**K. SRINIVASAN**  
 Co-ordinator  
 Curriculum Development  
 NGM College (Autonomous)  
 Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.**  
 Controller of Examinations  
 NGM College (Autonomous)  
 POLLACHI - 642 001.

|  |          |                       |    |  |  |             |
|--|----------|-----------------------|----|--|--|-------------|
| Programme Code:                                | B.Sc. CI |                       |    | Programme Title:                             | Bachelor of Science<br>(Computer Technology) |             |
| Course Code:                                   | 21UCT308 |                       |    | Title  | Batch:                                       | 2021 – 2024 |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 05       | Tutorial<br>Hrs./Sem. | 08 | CORE VI:<br>DATABASE<br>MANAGEMENT<br>SYSTEM | Semester:                                    | III         |
|  |          |                       |    |  | Credits:                                     | 04          |

### Course Objective

The learner would have to understand the fundamental concepts of database systems & use the features available in a DBMS package

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Keep in mind Queries in a DBMS, Structure of a DBMS attributes and entity sets   | K1              |
| CO2       | Comprehend deep knowledge about the basics of Relational Model and ACID properties                                     | K2              |
| CO3       | Apply joins and set operators, control structures and embedded SQL for data management and retrieval techniques        | K3              |
| CO4       | Analyze the basic issues of transaction processing, concurrency control and understand the importance of Normalization | K4              |
| CO5       | Familiarity on Parallel, Object Oriented & Distributed databases   | K4              |

## Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2              | H   | M   | H   | M   | H   | M   | H   | M   | H   | M    | H    | H    |
| CO3              | H   | M   | H   | M   | H   | M   | H   | M   | H   | M    | H    | H    |
| CO4              | M   | H   | M   | H   | L   | H   | M   | H   | L   | H    | M    | L    |
| CO5              | H   | L   | H   | L   | H   | M   | H   | L   | H   | M    | H    | M    |

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

| Units    | Content  | Hrs |
|----------|--|-----|
| Unit I   | Overview of database systems: Managing data – A historical perspective file systems versus a DBMS – Advantages of a DBMS – Describing and storing data in a DBMS – Queries in a DBMS– Structure of a DBMS. Database design & ER diagrams – Entities attributes and entity sets – Relationships and Relationship sets – Additional features of the ER model – conceptual database design with the ER model.                                 | 15  |
| Unit II  | Relational Model: Integrity constrains over relations – Enforcing integrity constraints – Querying relational data – Logical database design; ER to relational introduction to views – Destroying / Altering Tables & Views. Relational algebra and calculus: Relational Algebra – Relational Calculus.  | 15  |
| Unit III | SQL: Queries, Programming Triggers: The form of a basic SQL Query – UNION, INTERSECT and EXCEPT – Nested Queries – Aggregate operators – Null values – Complex integrity constraints in SQL – Triggers & Active data bases. Transaction Management Overview: The ACID properties – Transactions & Schedules – Concurrent execution of transactions – Lock-based concurrency control – performance of locking – Transaction support in SQL. | 15  |
| Unit IV  | Schema Refinement and normal forms: Introduction to schema refinement – Functional dependencies – Reasoning about functional dependencies – Normal forms – Properties of Decompositions – Normalization – Schema refinement in data base design – Other kinds of dependencies. Security: Introduction to database security – Access control –  | 15  |

Discretionary access control - Mandatory access control - Additional issues of security

Parallel & Distributed databases: Introduction - Architecture for parallel databases - Parallel Query evaluation - Parallelizing individual operations - Parallel query optimization - Introduction to distributed databases - Distributed DBMS architecture sorting data in a distributed DBMS. Object Database Systems: Motivation Example - Structured data types - Operation on structured data types - Encapsulation & ADTS - Inheritance - Objects, OIDS and reference Types - Database design for and ORDBMS - OODBMS - comparing RDBMS OODBMS and ORDBMS.

Unit V

15

**Total Contact Hrs**

**75**

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

**Text Book**

| S.NO | AUTHOR                              | TITLE OF THE BOOK           | PUBLISHERS \ EDITION                         | YEAR OF PUBLICATION |
|------|-------------------------------------|-----------------------------|--|---------------------|
| 1    | Raghu Ramakrishnan, Johannes Gehrke | Database Management Systems | Third edition, McGraw-Hill Higher Education. | 2014                |

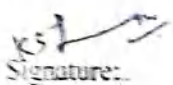
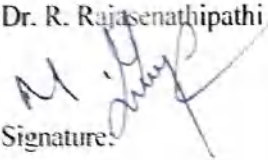
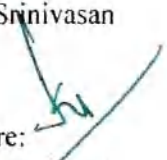

**Reference Books**

| S.NO | AUTHOR                                 | TITLE OF THE BOOK               | PUBLISHERS \ EDITION   | YEAR OF PUBLICATION |
|------|--|---------------------------------|--|---------------------|
| 1    | ArunMajumdar and Pritimoy Bhattacharya | Database Management Systems     | 1 <sup>st</sup> Edition, TMH, ISBN-13: 978-0074622301.                         | 2017                |
| 2    | Gerald V. Post                         | Database Management Systems     | 3 <sup>rd</sup> Edition, TMH Publication, ISBN-13: 9780070635265               | 2018                |
| 3    | Jonathan Gennick                       | Oracle SQLPlus Pocket Reference | 2 <sup>nd</sup> Edition, E.H. J. Pallett Publication, ISBN-13: 978-0596526887. | 2019                |



Web References

1. <http://freecomputerbooks.com/An-Introduction-to-Relational-Database-Theory.html>
2. [https://swayam.gov.in/nd?\\_ecce19\\_cs05/preview](https://swayam.gov.in/nd?_ecce19_cs05/preview)
3. <https://www.featuredcustomers.com>
4. [https://onlinecourses.nptel.ac.in/noc19\\_cs46/preview](https://onlinecourses.nptel.ac.in/noc19_cs46/preview)
5. <https://www.slideshare.net/NILESHX/database-management-system-28774171>

| Course Designed by  | Verified by HOD  | Checked by   | Approved by  |
|---|--|--|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Ms. K. S. Leelavathi   | Name:<br>Dr. R. Rajasenathipathi   | Name:<br>Mr. K. Srinivasan   | Name:<br>Dr. R. Manickachezian   |
| Signature:  | Signature:  | Signature:  | Signature:  |

**Dr. M. RAJASENATHIPATHI** M.A., B.C.A., M.P.H. 2007  
 Head of the Department  
 Department of Computer Technology  
 Vaidyanatha Swamikal Mahalingam College (Autonomous)  
 POLLACHI - 642 001.

**K. SRINIVASAN, M.C.A.**  
 Co-ordinator  
 Curriculum Development Cell (CDC)  
 NGM College (Autonomous)  
 Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN, M.Sc., M.S., P.D.**  
 Controller of Examinations  
 NGM College (Autonomous)  
 POLLACHI - 642 001.

|   |          |                               |    |                                   |  |             |
|---|----------|-------------------------------|----|-----------------------------------|--|-------------|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |    | <b>Programme Title:</b>           | Bachelor of Science<br>(Computer Technology) |             |
| <b>Course Code:</b>                                     | 21UCT309 |                               |    | <b>Title</b>                      | <b>Batch:</b>                                | 2021 – 2024 |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 05       | <b>Tutorial<br/>Hrs./Sem.</b> | 04 | CORE VII:<br>OPERATING<br>SYSTEMS | <b>Semester:</b>                             | III         |
|   |          |                               |    |                                   | <b>Credits:</b>                              | 04          |

### Course Objective

To recognize the concepts and principles, techniques and approaches which constitute a coherent body of knowledge in operating systems.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Keep in mind about operating system services, process, scheduling and memory allocations  | K1              |
| CO2       | Comprehend the various process management concepts including scheduling, synchronization, and deadlocks   | K2              |
| CO3       | Implement CPU Scheduling algorithms for process scheduling and deploy a deep knowledge about the memory management concepts including swapping, paging and segmentation | K3              |
| CO4       | Review synchronization problems, accessing methods in Files, Disk scheduling  | K4              |
| CO5       | Demonstrate an understanding of different I/O techniques in operating system.   | K4              |

### Mapping

| PO<br>/PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| <b>CO</b>  |     |     |     |     |     |     |     |     |     |      |      |      |
| <b>CO1</b> | M   | M   | H   | H   | H   | H   | H   | H   | H   | H    | L    | H    |
| <b>CO2</b> | H   | M   | H   | M   | H   | M   | H   | L   | M   | H    | M    | H    |
| <b>CO3</b> | M   | M   | H   | M   | H   | M   | H   | L   | M   | H    | M    | H    |
| <b>CO4</b> | M   | H   | M   | H   | L   | H   | M   | M   | H   | M    | H    | M    |
| <b>CO5</b> | M   | L   | H   | L   | H   | M   | H   | H   | M   | H    | M    | L    |

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

| Units                    | Content  | Hrs |
|--------------------------|--|-----|
| Unit I                   | Introduction: What is an Operating System – Evolution of Operating system<br><b>Operating-System Structures:</b> System Components- Operating System Services –System Calls – System Programs – System Structure.  | 15  |
| Unit II                  | <b>Process Management:</b> Process Concept – Process scheduling. <b>Threads:</b> Overview – Benefits- User and Kernel Threads- Multithreading Models. <b>CPU Scheduling:</b> Scheduling Criteria – Scheduling Algorithms. <b>Process Synchronization:</b> The Critical-Section Problem – Semaphores – Classic problems of Synchronization. | 15  |
| Unit III                 | <b>Deadlocks:</b> Deadlock Characterization – Methods for handling Deadlock – Deadlock prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlock – <b>Storage Management:</b> Swapping – Contiguous Memory allocation – Paging – Segmentation.   | 15  |
| Unit IV                  | <b>Virtual memory:</b> Demand Paging –Page Replacement: FIFO Page Replacement – Optimal Page Replacement – LRU Page Replacement. <b>File-System Interface:</b> File concept – Access methods – Directory Structure.  | 15  |
| Unit V                   | <b>File-System Implementation:</b> File System Structure – Allocation methods. <b>Mass Storage Structure:</b> Disk Structure – Disk Scheduling. <b>Case study:</b> Linux, Windows XP, Android OS (Memory management).  | 15  |
| <b>Total Contact Hrs</b> |  | 75  |

## Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

## Assessment Methods

Seminar, Quiz, Assignments, Group Task.

## Text Book

| S.NO | AUTHOR  | TITLE OF THE BOOK         | PUBLISHERS \ EDITION  | YEAR OF PUBLICATION |
|------|---|---------------------------|---|---------------------|
| 1    | Abraham Silberschatz, Peter Baer Galvin, Greg Gagne | Operating System Concepts | 9 <sup>th</sup> Edition, John Wiley and Sons, ISBN-13 9789812530554 | 2013                |

## Reference Books

| S.No | Author          | Title of The Book | Publishers \ Edition  | Year Of Publication |
|------|-----------------|-------------------|---|---------------------|
| 1    | Achyut.SGodbole | Operating Systems | 1 <sup>st</sup> Edition, - TMH Publications, ISBN- 9780070591134.               | 2010                |
| 2    | H. M Deitel     | Operating Systems | 3 <sup>rd</sup> Edition, Pearson Education Publication, ISBN 13: 9780536212153. | 2012                |

## Web References

|    |   |
|----|---|
| 1. | <a href="http://nptel.ac.in/courses/106108101/13">http://nptel.ac.in/courses/106108101/13</a>   |
| 2. | <a href="https://developer.android.com/topic/performance/memory-overview.html">https://developer.android.com/topic/performance/memory-overview.html</a>                                       |
| 3. | <a href="https://www.geeksforgeeks.org/operating-system-types-operating-systems-awaiting-author/">https://www.geeksforgeeks.org/operating-system-types-operating-systems-awaiting-author/</a> |
| 4. | <a href="https://www.slideshare.net/ashanrajpar/operating-system-presentation-60556413">https://www.slideshare.net/ashanrajpar/operating-system-presentation-60556413</a>                     |
| 5. | <a href="https://www.os-book.com/OS9/slide-dir/index.html">https://www.os-book.com/OS9/slide-dir/index.html</a>   |

| Course Designed by   | Verified by HOD  | Checked by  | Approved by  |
|--|--|---|--|
| Name and Signature   | Name and Signature   | Co-ordinator CDC  | COE  |
| Name:<br>Dr. R. Jayaprakash  | Name:<br>Dr. R. Rajasenathipathi   | Name:<br>Mr. K. Srinivasan  | Name:<br>Dr. R. Manickachezian   |
| Signature:  | Signature: <br><b>Dr. M. RAJASENATHIPATHI</b> M.A., M.C.A., M.P.N., Ph.D.<br>Head of the Department | Signature:  | Signature:  |

Department of Computer Technology  
Hollamathu Gounder Mahalingam College (Autonomous)  
POLLACHI - 642 001.

**K. SRINIVASAN, M.C.A.,**  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,**  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

|  |           |                       |    |  |  |             |
|--|-----------|-----------------------|----|--|--|-------------|
| Programme Code:                                | B.Sc. CT  |                       |    | Programme Title:                       | Bachelor of Science<br>(Computer Technology) |             |
| Course Code:                                   | 21UCT 3A3 |                       |    | Title                                  | Batch:                                       | 2021 – 2024 |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 05        | Tutorial<br>Hrs./Sem. | 06 | ALLIED III:<br>SOFTWARE<br>ENGINEERING | Semester:                                    | III         |
|  |           |                       |    |  | Credits:                                     | 04          |

### Course Objective

To enhance the basic software engineering methods and practices and to learn the techniques for developing software systems

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Keep in mind layers of process models, Requirement gathering phases design concepts and testing strategies   | K1              |
| CO2       | Picture out the main aspects of software engineering and evaluate requirements for a software system and analyzing the requirements through modeling | K2              |
| CO3       | Apply the process of analysis and design using the object-oriented approach  | K3              |
| CO4       | Interpret the design engineering and various Testing tactics   | K4              |
| CO5       | Inculcate knowledge on Software engineering concepts in turn gives a roadmap to design a new software project.                                       | K4              |

### Mapping

| PO /PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1           | H   | H   | H   | H   | H   | H   | H   | H   | L   | H    | H    | H    |
| CO2           | H   | M   | H   | M   | H   | H   | M   | H   | M   | H    | M    | L    |
| CO3           | H   | M   | H   | M   | H   | L   | M   | H   | M   | H    | M    | H    |
| CO4           | M   | H   | L   | H   | M   | M   | H   | M   | H   | M    | H    | M    |
| CO5           | H   | L   | H   | M   | H   | H   | M   | H   | M   | L    | M    | H    |

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

| Units    | Content   | Hrs |
|----------|---|-----|
| Unit I   | <b>Introduction to Software Engineering:</b> The evolving role of software - Changing Nature of Software - Software myths. <b>A Generic view of process:</b> Software engineering - A layered technology - a process framework - The Capability Maturity Model Integration (CMMI). <b>Process models:</b> The waterfall model -Incremental process models - Evolutionary process models.                      | 15  |
| Unit II  | <b>System Engineering:</b> Computer-Based Systems – The system engineering Hierarchy, <b>Requirements Engineering:</b> A bridge to design and construction <b>Requirements Engineering Tasks</b> – Initiating the Requirements Engineering Process - Eliciting Requirements – Building the Analysis Model.  | 15  |
| Unit III | <b>Building the Analysis Model:</b> Requirement analysis – Analysis Modeling approaches – Data modeling concepts – Object-Oriented Analysis- Scenario-Based Modeling – Flow - Oriented Modeling – Class-Based Modeling – Creating a Behavioral Model.   | 16  |
| Unit IV  | <b>Design Engineering:</b> Design process and Design quality - Design concepts - the design model. <b>Creating an architectural design:</b> Software architecture - Data design - Architectural Design.   | 13  |
| Unit V   | <b>Testing Strategies:</b> Software Testing Lifecycle- Test strategies for conventional software, Validation testing, System testing - The art of Debugging. <b>Testing Tactics:</b> Black - Box and White-Box Testing - Basis path Testing – Control Structure Testing - Black-Box Testing. <b>Testing for Web Apps:</b> Performance testing: Performance testing objectives - Load testing – Stress Testing | 16  |
|          | <b>Total Contact Hrs</b>  | 75  |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

## Text Book


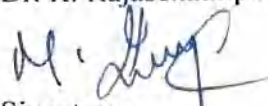


| S.NO | AUTHOR         | TITLE OF THE BOOK                                  | PUBLISHERS \ EDITION   | YEAR OF PUBLICATION |
|------|----------------|--|--|---------------------|
| 1    | Roger Pressman | S. Software Engineering, A Practitioner's Approach | 6 <sup>th</sup> Edition, TATA McGraw-Hill Publications, ISBN-13 : 978-0071267823 | 2013                |

## Reference Books

| S.NO | AUTHOR          | TITLE OF THE BOOK    | PUBLISHERS \ EDITION   | YEAR OF PUBLICATION |
|------|-----------------|----------------------|--|---------------------|
| 1    | Ian Sommerville | Software Engineering | 9 <sup>th</sup> Edition, Addison Wesley, ISBN-13: 978-0137035151                                 | 2010                |
| 2    | Stephen Schacht | Software Engineering | 7 <sup>th</sup> Edition, New Delhi, Tata McGraw Hill Publishing Company, ISBN-13: 9780070647770. | 2012                |

## Web References

|  |
|--|
| 1. <a href="https://nptel.ac.in/courses/106/105/106105218/">https://nptel.ac.in/courses/106/105/106105218/</a>   |
| 2. <a href="https://swayam.gov.in/nd1_noc19_cs70/preview">https://swayam.gov.in/nd1_noc19_cs70/preview</a>   |
| 3. <a href="https://freevideolectures.com/course/4071/nptel-software-project-management">https://freevideolectures.com/course/4071/nptel-software-project-management</a>   |
| 4. <a href="https://www.nptelvideos.com/video.php?id=918">https://www.nptelvideos.com/video.php?id=918</a>   |
| 5. <a href="https://www.w3schools.in/sdlc-tutorial/software-development-life-cycle-sdlc/">https://www.w3schools.in/sdlc-tutorial/software-development-life-cycle-sdlc/</a> |

| Course Designed by   | Verified by HOD   | Checked by  | Approved by   |
|--|---|---|---|
| Name and Signature   | Name and Signature  | Co-ordinator CDC  | COE   |
| Name:<br>Ms. A. Kalavani   | Name:<br>Dr. R. Rajasenathipathi  | Name:<br>Mr. K. Srinivasan  | Name:<br>Dr. R. Manickachezian  |
| Signature:<br> | Signature:<br> | Signature:<br><br><b>K. SRINIVASAN, M.C.A.</b> | Signature:<br> |

Dr. M. RAJASENATHIPATHI M.A., M.C.A., M.Phil., Ph.D.

Head of the Department

Department of Computer Technology, NGM College (Autonomous)

Muthu Gounder Mahalingam College (Autonomous)

POLLACHI - 642 001.

Co-ordinator

Curriculum Development Cell (CDC)

Pollachi - 642 001.

Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,

Controller of Examinations

NGM College (Autonomous)

POLLACHI - 642 001.



|  |          |                       |   |  |  |           |  |
|--|----------|-----------------------|---|--|--|-----------|--|
| Programme Code:                                | B.Sc. C1 |                       |   | Programme Title:                       | Bachelor of Science<br>(Computer Technology) |           |  |
| Course Code:                                   | 21UCT310 |                       |   | Title                                  | Batch:                                       | 2021-2022 |  |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 04       | Tutorial<br>Hrs./Sem. | 0 | LAB - III - JAVA<br>PROGRAMMING<br>LAB | Semester:                                    | III       |  |
|  |          |                       |   |  | Credits:                                     | 02        |  |

### Course Objective

To utilize java programming concepts for developing, compiling and running java applications and applets.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Understand the basic concepts of Java Programming with emphasis on ethics and principles of professional coding                                       | K3              |
| CO2       | Demonstrate the creation of objects, classes and methods and the concepts of constructor, methods overloading, Arrays, branching and looping          | K4              |
| CO3       | Create data files and Design a page using AWT controls and Mouse Events in Java programming Implement the concepts of code reusability and debugging. | K3              |
| CO4       | Develop applications using Strings, Interfaces and Packages and applets   | K4              |
| CO5       | Construct Java programs using Multithreaded Programming and Exception Handling  | K4              |

### Mapping

| PO / PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1      | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2      | H   | M   | H   | M   | H   | M   | H   | H   | M   | H    | M    | H    |
| CO3      | H   | M   | H   | M   | H   | M   | H   | H   | M   | H    | M    | H    |
| CO4      | M   | H   | L   | H   | M   | H   | L   | M   | H   | L    | H    | M    |
| CO5      | H   | L   | H   | M   | H   | H   | H   | H   | H   | H    | H    | M    |

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



| Content  | Hrs       |
|--|-----------|
| <b>Sample Programs</b>   |           |
| 1. Write a java program to illustrate the concept of Package creation.             |           |
| 2. Write a java program to illustrate the concept of threading.                    |           |
| 3. Write a java program to illustrate the concept of synchronization.              |           |
| 4. Write a java program to illustrate the concept of Exception Handling Mechanism. | 60        |
| 5. Write a java program to develop an Applet.                                      |           |
| 6. Write a java program to implement to the concept of decision making statements. |           |
| 7. Write a java applet program to illustrate the concept of multithreading.        |           |
| 8. Write a java program using file concept.  |           |
| 9. Write a java program to illustrate the concept of control statements            |           |
| 10. Write a java program to illustrate the concept of Useful I/O Classes           |           |
| <b>Total Contact Hrs</b>   | <b>60</b> |

## Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

## Assessment Methods

Seminar, Quiz, Assignments, Group Task.

| Course Designed by   | Verified by HOD   | Checked by   | Approved by   |
|--|---|--|---|
| Name and Signature   | Name and Signature  | Co-ordinator CDC   | COE   |
| Name:<br>Ms. C. Keerthana  | Name:<br>Dr. R. Rajasenathipathi  | Name:<br>Mr. K. Srinivasan   | Name:<br>Dr. R. Manickachezian  |
| Signature:<br> | Signature:<br> | Signature:<br> | Signature:<br> |

**Dr. M. RAJASENATHIPATHI**, M.A., M.Ed., Ph.D.  
Head of the Department, Curriculum Development Cell (CDC)  
Department of Computer Technology, NGM College (Autonomous)  
Nalkkanuthu Gowder Mahalingam College (Autonomous), Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN**, M.Sc., M.S., Ph.D.  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

|   |          |                               |   |   |  |             |  |
|---|----------|-------------------------------|---|---|--|-------------|--|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |   | <b>Programme Title:</b>                         | Bachelor of Science<br>(Computer Technology) |             |  |
| <b>Course Code:</b>                                     | 21UCT311 |                               |   | <b>Title</b>                                    | <b>Batch:</b>                                | 2021 – 2024 |  |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 04       | <b>Tutorial<br/>Hrs./Sem.</b> | 0 | LAB-IV-<br>DATABASE<br>MANAGEMENT<br>SYSTEM LAB | <b>Semester:</b>                             | III         |  |
|   |          |                               |   |   | <b>Credits:</b>                              | 02          |  |

### Course Objective

To enable the students to know about database concepts with practical Knowledge

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Recollect the basic commands such as DDL, DML, TCL   | K3              |
| CO2       | Understand about various set, join operations and group functions in PL/SQL                | K4              |
| CO3       | Develop various set and join operation in SQL  | K4              |
| CO4       | Use PL/SQL stored procedure, stored functions, cursors and packages to query the database. | K4              |
| CO5       | Validate the PL/SQL cursors, GROUPBY clauses   | K4              |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2              | H   | M   | H   | H   | H   | M   | H   | M   | H   | H    | M    | H    |
| CO3              | H   | M   | H   | H   | H   | M   | H   | M   | H   | L    | M    | H    |
| CO4              | M   | H   | L   | M   | M   | H   | L   | H   | M   | M    | H    | M    |
| CO5              | H   | L   | H   | H   | H   | L   | H   | M   | H   | H    | M    | H    |

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


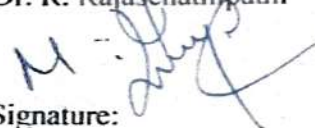


| Content  | Hrs       |
|--|-----------|
| <b>Sample Programs</b><br><b>Sample Programs</b><br>1. Write a query for DDL and DML commands.   |           |
| 2. Write a query for TCL commands.<br>3. Write a query for NOT NULL, CHECK, UNIQUE constraints.<br>4. Write a query to implement functions in SQL.<br>5. Write a query for JOIN operations.<br>6. Write a query to implement set operator<br>7. Write a SQL program for user-defined exception<br>8. Write a SQL block to delete and update using trigger.<br>9. Write a query for the HAVING clause.<br>10. Write a query for GROUP BY clause | <b>60</b> |
| <b>Total Contact Hrs</b>   | <b>60</b> |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

| Course Designed by   | Verified by HOD   | Checked by  | Approved by   |
|--|---|---|---|
| Name and Signature   | Name and Signature  | Co-ordinator CDC  | COE   |
| Name:  | Name:   | Name:   | Name:   |
| Ms. K.S.Leelavathi<br><br>Signature:  | Dr. R. Rajasenathipathi<br><br>Signature:  | Mr. K. Srinivasan<br><br>Signature:  | Dr. R. Manickachezian<br><br>Signature:  |

**Dr. M. RAJASENATHIPATHI** M.A., M.C.A., M.FIN., Ph.D.

Head of the Department

Department of Computer Technology Curriculum Development Cell (CDC)

Nallamvithu Gownder Mahalingam College (Autonomous)

POLLACHI - 642 001.

**K. SRINIVASAN**, M.C.A.,

Co-ordinator

NGM College (Autonomous)

Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN**, M.Sc., M.S., Ph.D.

Controller of Examinations

NGM College (Autonomous)

POLLACHI - 642 001.

|  |          |                       |    |   |  |             |  |
|--|----------|-----------------------|----|---|--|-------------|--|
| Programme Code:                                | B.Sc. CT |                       |    | Programme Title:                                      | Bachelor of Science<br>(Computer Technology) |             |  |
| Course Code:                                   | 21UCT3N1 |                       |    | Title   | Batch:                                       | 2021 – 2024 |  |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 01       | Tutorial<br>Hrs./Sem. | 04 | Skill Based NON-<br>MAJOR<br>ELECTIVE I -<br>HTML LAB | Semester:                                    | III         |  |
|  |          |                       |    |   | Credits:                                     | 02          |  |

### Course Objective

To understand the principles of creating an effective web page using HTML.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Keep in mind the concept of Basic HTML tags   | K3              |
| CO2       | Understand about ordered list and unordered list, creation of table, creations of forms | K4              |
| CO3       | Validate the creation of a simple webpage using basic HTML                              | K4              |
| CO4       | Use scripting Techniques for dynamic effects and to validate form input entry           | K3              |
| CO5       | Analyze to Use appropriate client-side or Server-side applications                      | K4              |

### Mapping

| PO /PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1           | H   | H   | H   | H   | H   | H   | H   | H   | L   | H    | H    | H    |
| CO2           | H   | M   | H   | M   | H   | H   | M   | H   | M   | H    | M    | L    |
| CO3           | H   | M   | H   | M   | H   | L   | M   | H   | M   | H    | M    | H    |
| CO4           | M   | H   | L   | H   | M   | M   | H   | M   | H   | M    | H    | M    |
| CO5           | H   | L   | H   | M   | H   | H   | M   | H   | M   | L    | M    | H    |

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

| Content  | Hrs       |
|--|-----------|
| <b>Sample Programs</b>   |           |
| 1. Create a HTML document using basic HTML tags.                   |           |
| 2. Create a HTML program with text formatting tags.                |           |
| 3. Create a HTML program to set the background color.              |           |
| 4. Create a link by using HTML tags.                               |           |
| 5. Create a HTML program to insert an image in a document.         | 15        |
| 6. Create a HTML program to create a table.                        |           |
| 7. Create a HTML program to implement ordered list with numbers.   |           |
| 8. Create a HTML program to implement ordered list with alphabets. |           |
| 9. Create a HTML program to implement unordered list.              |           |
| 10. Create a Form with input box and submit button.                |           |
| <b>Total Contact Hrs</b>   | <b>15</b> |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

| Course Designed by   | Verified by HOD  | Checked by   | Approved by   |
|--|--|--|---|
| Name and Signature   | Name and Signature   | Co-ordinator CDC   | COE   |
| Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:                                | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:                                | Name:<br>Mr. K. Srinivasan<br><br>Signature: | Name:<br>Dr. R. Manickachezian<br><br>Signature: |
| Dr. M. RAJASENATHIPATHI<br>Head of the Department<br>Department of Computer Technology<br>Kallanurthi Gounder Mahalingam College (Autonomous)<br>POLLACHI - 642 001. | Dr. M. RAJASENATHIPATHI<br>Head of the Department<br>Department of Computer Technology<br>Kallanurthi Gounder Mahalingam College (Autonomous)<br>POLLACHI - 642 001. | K. SRINIVASAN, M.C.<br>Co-ordinator<br>Curriculum Development Cell<br>NGM College (Autonomous)<br>Pollachi - 642 001.            | Dr. R. MANICKACHEZIAN<br>Controller of Examinations<br>NGM College (Autonomous)<br>POLLACHI - 642 001.                                |

|  |          |                       |   |  |  |             |  |
|--|----------|-----------------------|---|--|--|-------------|--|
| Programme Code:                                | B.Sc. CT |                       |   | Programme Title:   | Bachelor of Science<br>(Computer Technology) |             |  |
| Course Code:                                   | 21UCT3N2 |                       |   | Title  | Batch:                                       | 2021 – 2024 |  |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 01       | Tutorial<br>Hrs./Sem. | 0 | Skill Based NON-<br>MAJOR<br>ELECTIVE 1 -<br>MULTIMEDIA<br>LAB | Semester:                                    | III         |  |
|  |          |                       |   |  | Credits:                                     | 02          |  |

### Course Objective

To offer the knowledge of creating and working with digital images and to manipulate them and to develop a presentation package using multimedia tools

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Keep in mind the concept of Basic Multimedia Techniques  | K3              |
| CO2       | Discuss the application of multimedia concepts in the development of information visualization and business applications.    | K4              |
| CO3       | Validate the creation of a simple applications using multimedia tools  | K4              |
| CO4       | Use scripting Techniques for dynamic effects and to validate form input entry  | K3              |
| CO5       | Comprehend and analyse the fundamentals of animation, virtual reality, underlying technologies, principles and applications. | K4              |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | L   | H    | H    | H    |
| CO2              | H   | M   | H   | M   | H   | H   | M   | H   | M   | H    | M    | L    |
| CO3              | H   | M   | H   | M   | H   | L   | M   | H   | M   | H    | M    | H    |
| CO4              | M   | H   | L   | H   | M   | M   | H   | M   | H   | M    | H    | M    |
| CO5              | H   | L   | H   | M   | H   | H   | M   | H   | M   | L    | M    | H    |

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



| Content  | Hrs       |           |
|--|-----------|-----------|
| <b>Sample Programs</b>                                   |           |           |
| 1. Cropping images using Lasso Tool                      |           |           |
| 2. Designing Pictures using Paint Tools                  |           |           |
| 3. Designing Text using Text Tools                       |           |           |
| 4. Applying Layer Effects to Images and Texts            |           |           |
| 5. Designing an Employee or Student ID card              | <b>15</b> |           |
| 6. Designing a seasonal greetings                        |           |           |
| 7. Design a photograph applying Filter effects           |           |           |
| 8. Design an invitation for a conference                 |           |           |
| 9. Design a brochure or poster for a technical symposium |           |           |
| 10. Designing a Flexible banner for your college         |           |           |
| <b>Total Contact Hrs</b>                                 |           | <b>15</b> |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

| Course Designed by   | Verified by HOD  | Checked by   | Approved by  |
|--|--|--|--|
| Name and Signature   | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Ms. C. Keerthana<br><br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

**Dr. M. RAJASENATHIPATHI** M.A., M.C.A., M.P.M., Ph.D.  
 Head of the Department  
 Department of Computer Technology  
 J. Jayanthi Gounder Mahalingam College (Autonomous)  
 POLLACHI - 642 001.

Co-ordinator  
 Curriculum Development Cell (CDC)  
 NGM College (Autonomous)  
 Pollachi - 642 001

**Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.**  
 Controller of Examinations  
 NGM College (Autonomous)  
 POLLACHI - 642 001.

# SEMESTER- IV

|  |          |                       |    |  |  |             |
|--|----------|-----------------------|----|--|--|-------------|
| Programme Code:                                | B.Sc. CT |                       |    | Programme Title:                           | Bachelor of Science<br>(Computer Technology) |             |
| Course Code:                                   | 21UCT412 |                       |    | Title                                      | Batch:                                       | 2021 – 2024 |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 05       | Tutorial<br>Hrs./Sem. | 04 | CORE VIII:<br>ADVANCED JAVA<br>PROGRAMMING | Semester:                                    | IV          |
|  |          |                       |    |  | Credits:                                     | 04          |

### Course Objective

To inculcate the students to understand the advanced JAVA concepts and develop Java based applications by applying these advanced concepts to implement in web based applications.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Create Applications using Swing Components.                             | K4              |
| CO2       | Understand about Servlets and Server Side Includes                      | K2              |
| CO3       | Implement JDBC connectivity and Java Server Pages                       | K3              |
| CO4       | Review the various types of beans                                       | K4              |
| CO5       | Understand and apply Well-Formed XML and different types of XML Schemas | K5              |

### Mapping

| PO /PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1           | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2           | H   | M   | H   | M   | H   | H   | M   | H   | M   | H    | L    | M    |
| CO3           | H   | M   | H   | M   | H   | H   | M   | H   | M   | H    | M    | H    |
| CO4           | M   | H   | L   | H   | M   | M   | H   | L   | H   | M    | H    | M    |
| CO5           | H   | L   | H   | M   | H   | H   | L   | H   | M   | H    | H    | M    |

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

| Units    | Content  | Hrs       |
|----------|--|-----------|
| Unit I   | Tour of Swing: JApplet- Icons and Labels – JText Fields – JButtons – JCombo Boxes - JTabbed Panes – JScroll Panes – JTrees – JTables– Exploring Swing.   | 15        |
| Unit II  | Servlet Overview and Architecture, Movement to Server-Side Java – Java Servlet - Practical applications for Java Servlets – Java Servlet Alternatives – Reasons to Use Java Servlets – Java Servlet Architecture. Servlet Basics – The Life Cycle of a Servlet – | 15        |
|          | A Basic Servlet – Basic Servlet Source – Building and Installing the Basic Servlet – The HTML Required to Invoke the Servlet – Dissecting the Basic Servlet.   |           |
| Unit III | JSP –Conditions – Directives – Declarations- Implicit Variables – Scriptlets – Expressions. Servlet Sessions: Session Tracking – Working with Cookies.   | 15        |
| Unit IV  | Enterprise Java Bean: Introduction – Enterprise Java Bean Technology - Types of Bean - Examples of EJB. Server-Side includes - Servlet chaining: Uses for Servlet chain - Invoking a Servlet Chain– A practical Example using Servlet Chaining.                  | 15        |
| Unit V   | Servlets and JDBC– Two and Three-tier Database Access Models – JDBC Driver Types – JDBC Basics – A Basic JDBC Servlet – JDBC RMI.  | 15        |
|          | <b>Total Contact Hrs</b>   | <b>75</b> |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|

## Text Book


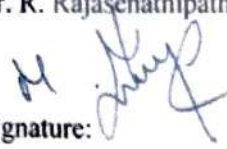


| S.NO | AUTHOR   | TITLE OF THE BOOK                   | PUBLISHERS \ EDITION  | YEAR OF PUBLICATION |
|------|--|-------------------------------------|---|---------------------|
| 1    | Herbert Schildt  | JAVA 2: The Complete Reference      | 5 <sup>th</sup> Edition, Tata-McGraw Hill, ISBN-13: 9780070495432   | 2017                |
| 2    | James Goodwill   | Developing Java Servlets            | 2 <sup>nd</sup> Edition, Tech media, ISBN-13: 978-0672321078        | 2014                |
| 3    | Rima Patel<br>Sriganesh,<br>Gerald Brose,<br>Micah<br>Silverman. | Mastering Enterprise Java Beans 3.0 | Wiley India Edition, Wiley India Pvt. Ltd, ISBN-13 : 978-0471785415 | 2011                |

## Reference Books

| S.NO | AUTHOR   | TITLE OF THE BOOK                         | PUBLISHERS \ EDITION   | YEAR OF PUBLICATION |
|------|--|---|--|---------------------|
| 1    | Subrahmanyam Allaramaju, Cedric Buest, Marc Wilcox, Sameer Tyagi | Professional Java Server Programming J2EE | 1.3 Edition, WROX Press Ltd, ISBN-13: 9781861005373                    | 2001                |
| 2    | Jayson Falkner and Kevin Jones.                                  | The J2EE Technology Web Tier              | 1 <sup>st</sup> Edition, Addison-Wesley Professional ISBN: 0321136497. | 2004                |

## Web References

|    |   |
|----|---|
| 1. | <a href="https://www.tutorialspoint.com/javascript">https://www.tutorialspoint.com/javascript</a>   |
| 2. | <a href="https://www.w3schools.com/">https://www.w3schools.com/</a>   |
| 3. | <a href="https://www.swayaminfotech.com/blog/tag/j2ee/">https://www.swayaminfotech.com/blog/tag/j2ee/</a>   |
| 4. | <a href="https://onlinecourses.nptel.ac.in/noc19_cs84/preview">https://onlinecourses.nptel.ac.in/noc19_cs84/preview</a>   |
| 5. | <a href="https://www.tutorialspoint.com/listtutorial/Web-Application-J2EE-perspective/3142">https://www.tutorialspoint.com/listtutorial/Web-Application-J2EE-perspective/3142</a> |

| Course Designed by  | Verified by HOD  | Checked by  | Approved by  |
|---|--|---|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC  | COE  |
| Name:<br>Dr. R. Jayaprakash<br><br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

**K. SRINIVASAN, M.C.A.,**

**Dr. M. RAJASENATHIPATHI** M.A., M.C.A., M.P.M., Ph.D.  
Head of the Department  
Department of Computer Technology  
Kallamuthu Gounder Makalingam College (Autonomous)  
POLLACHI - 642 001.

Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,**  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

|  |          |                       |   |  |  |             |  |
|--|----------|-----------------------|---|--|--|-------------|--|
| Programme Code:                                | B.Sc. CT |                       |   | Programme Title:                           | Bachelor of Science<br>(Computer Technology) |             |  |
| Course Code:                                   | 21UCT413 |                       |   | Title                                      | Batch:                                       | 2021 – 2024 |  |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 05       | Tutorial<br>Hrs./Sem. | 4 | CORE IX: LINUX<br>AND SHELL<br>PROGRAMMING | Semester:                                    | IV          |  |
|  |          |                       |   |  | Credits:                                     | 04          |  |

### Course Objective

This course introduces basic understanding of Linux OS, Linux commands and File system and to familiarize students with the Linux environment.

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Remember the operating system architecture and low level interfaces that are required to build Linux systems | K1              |
| CO2       | Understand different commands used by system administrator and file related commands                         | K2              |
| CO3       | Apply various Linux operating system commands and utilities in Linux systems                                 | K3              |
| CO4       | Evaluate the shell scripts with different programming goals  | K4              |
| CO5       | Analyze different types of shell associated commands   | K5              |

### Mapping

| PO / PSO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1           | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2           | H   | M   | H   | M   | H   | M   | H   | M   | H   | H    | M    | H    |
| CO3           | H   | M   | H   | M   | H   | M   | H   | M   | H   | H    | M    | H    |
| CO4           | M   | H   | L   | H   | M   | H   | L   | H   | M   | M    | H    | L    |
| CO5           | H   | L   | H   | M   | H   | L   | H   | M   | H   | H    | L    | H    |

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

| Units    | Content   | Hrs |
|----------|---|-----|
| Unit I   | <p><b>Introduction:</b> Hardware Requirements for Linux – Salient Features – Multiuser Capability, Multitasking Capability, Communication, Security, Portability –Linux System Organization – Types of Shells – Bourne Shell, C shell, Korn Shell - Unix Commands.</p> <p><b>Unix File System:</b> Creating Files – Indulging in File Play – Listing Files and Directories – Masking File Permissions – Directory Permissions – Removing File Forcibly – Directory Related Commands – Miscellaneous Commands.</p>   | 15  |
| Unit II  | <p><b>File System:</b>The Boot Block, The Super Block, The Inode Table, Data Blocks – Storage of Files – Disk Related Commands – Disk Usage.</p> <p><b>Essential Linux Commands:</b> Password - cal command – banner command –touch command – file command – Links with DOS – File Related Commands –wc, sort, cut, grep, dd – Viewing Files – File Compression.</p>  | 15  |
| Unit III | <p><b>VI Editor:</b> Modes of Operations – Learning the Ropes – Adding Text, Delete Text, Overwriting Text, Quitting vi – Block Commands – Search Strings – Find and Replace, Delete and Paste, Yank and Paste – Set Command – Customizing vi Environment – Multiple File Editing in vi.</p> <p><b>Processes in Linux:</b>ps command – Background Process – The nohupCommand Killing a Process – Changing Process Priorities – Scheduling of Processes –‘at’ command – ‘batch’ command – ‘crontab’ command.</p> <p><b>Communication:</b> ‘Write’ command – ‘wall’ command –‘mail’ Command</p> | 15  |
| Unit IV  | <p><b>Programming with Shell:</b> Introduction to shell script-creation and execution-system variables-profile-read statement-command line arguments-logical operators &amp;&amp; and   -exit-if conditional-case-while statement-for set-shift-trap statement-shell variables-cd command-merging stream-expr command-eval command-shell programs.</p>  | 15  |
| Unit V   | <p><b>System Administration:</b> System Administrator-Booting and shutting down-super user status (su) - security-user services - disk management (fsck) - operation -file system administration-backups utilities - cpio- afio- shutdown – mount –unmount – df - find commands-creating device files-installing and managing printers.</p>   | 15  |
|          | <b>Total Contact Hrs</b>  | 75  |



## Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

## Assessment Methods

Seminar, Quiz, Assignments, Group Task.

## Text Book


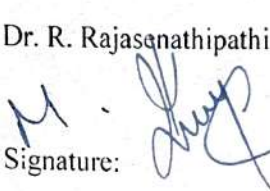
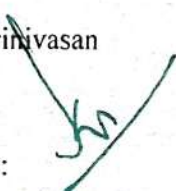

| S.NO | AUTHOR             | TITLE OF THE BOOK                                  | PUBLISHERS \ EDITION                      | YEAR OF PUBLICATION |
|------|--------------------|--|---|---------------------|
| 1    | Yashavant Kanetkar | UNIX Shell Programming (Unit I – III)              | BPB Publications, 3 <sup>rd</sup> Edition | 2016                |
| 2    | Sumitabha das      | UNIX System Concepts and Applications (Unit IV, V) | Tata McGraw - Hill, Fourth edition        | 2014                |

## Reference Books

| S.NO | AUTHOR        | TITLE OF THE BOOK              | PUBLISHERS \ EDITION | YEAR OF PUBLICATION |
|------|---------------|--------------------------------|----------------------|---------------------|
| 1    | Mark.G.Gobell | Red Hat LINUX-Reference Manual | Pearson education    | 2014                |

## Web References

|    |   |
|----|---|
| 1. | <a href="https://www.tutorialspoint.com/unix">https://www.tutorialspoint.com/unix</a>   |
| 2. | <a href="https://lecturenotes.in/subject/455/linux-programming-lp">https://lecturenotes.in/subject/455/linux-programming-lp</a> |
| 3. | <a href="https://linuxconfig.org/linux-command-line-tutorial">https://linuxconfig.org/linux-command-line-tutorial</a>           |
| 4. | <a href="https://www.guru99.com/unix-linux-tutorial.html">https://www.guru99.com/unix-linux-tutorial.html</a>                   |
| 5. | <a href="https://onlinecourses.swayam2.ac.in/aic20_sp26/preview">https://onlinecourses.swayam2.ac.in/aic20_sp26/preview</a>     |

| Course Designed by   | Verified by HOD   | Checked by   | Approved by   |
|--|---|--|---|
| Name and Signature   | Name and Signature  | Co-ordinator CDC   | COE   |
| Name:<br>Ms. A. Kalaivani<br><br>Signature: | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature: | Name:<br>Mr. K. Srinivasan<br><br>Signature: | Name:<br>Dr. R. Manickachezian<br><br>Signature: |

**Dr. M. RAJASENATHIPATHI** M.A., M.C.A., M.Phil., B.Ed.  
Head of the Department  
Department of Computer Technology  
Nallanurthi Gounder Mahalingam College (Autonomous)  
POLLACHI - 642 001.

**Mr. K. SRINIVASAN**, M.C.A.  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN**, M.Sc., M.S., Ph.D.  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

|   |          |                               |    |   |  |             |
|---|----------|-------------------------------|----|---|--|-------------|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |    | <b>Programme Title:</b>                       | Bachelor of Science<br>(Computer Technology) |             |
| <b>Course Code:</b>                                     | 21UCT414 |                               |    | <b>Title</b>                                  | <b>Batch:</b>                                | 2021 – 2024 |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 05       | <b>Tutorial<br/>Hrs./Sem.</b> | 03 | CORE X: DATA<br>COMMUNICATION<br>AND NETWORKS | <b>Semester:</b>                             | IV          |
|   |          |                               |    |   | <b>Credits:</b>                              | 04          |

### Course Objective

1. To identify various components in a data communication system and understand state-of-the-art in network protocols, architectures and applications.
2. To enable students through the concepts of computer networks, different models and their involvement in each stage of network communication.
3. To educate the concepts of terminology and concepts of the OSI reference model and the TCP/IP reference model and protocols such as TCP, UDP and IP.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Remember the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types of networks. | K1              |
| CO2       | Understand Internet structure and can see how standard problems are solved and the use of cryptography and network security.  | K2              |
| CO3       | Apply knowledge of different techniques of error detection and correction to detect and solve error bit during data transmission.                                   | K3              |
| CO4       | Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies                              | K4              |
| CO5       | Knowledge about different computer networks, reference models and the functions of each layer in the models   | K5              |

Mapping

| PO / PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1      | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2      | H   | M   | H   | M   | H   | H   | M   | H   | M   | H    | H    | H    |
| CO3      | H   | M   | H   | M   | H   | H   | M   | H   | M   | H    | L    | M    |
| CO4      | M   | H   | L   | H   | M   | M   | H   | L   | H   | M    | M    | M    |
| CO5      | H   | L   | H   | M   | H   | H   | L   | H   | M   | H    | H    | M    |

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

| Units    | Content  | Hrs       |
|----------|--|-----------|
| Unit I   | <b>Introduction to Data Communications and Networking:</b> Data Communications- Protocols - Analog and Digital Signals. Analog and Digital Transmission Methods – Modes of Data Transmission and Multiplexing.   | 15        |
| Unit II  | <b>Transmission Errors:</b> Detection and Correction. <b>Transmission Media:</b> Guided Media. Unguided Media. <b>Network Topologies:</b> Mesh, Star, Tree, Ring, Bus. <b>Switching Basics-</b> Circuit switching - Packet switching - Message switching - Router and Routing. | 15        |
| Unit III | <b>Network Protocols and OSI Model:</b> OSI layer Functions. Local Area Networks (LAN), Metropolitan Area Networks (MAN) and Wide Area Networks (WAN) –Frame Relay.  | 15        |
| Unit IV  | <b>Internetworking Concepts, Devices, Internet Basics, History and Architecture:</b> Internetworking Devices, Repeaters, Bridges, Routers and Gateways. <b>An Introduction to TCP/ IP, IP:</b> TCP/IP Basics, TCP/IP Example, The concept of IP Address– IPV6.                 | 15        |
| Unit V   | <b>TCP/IP Part II:</b> User Datagram Protocol (UDP) - UDP Packet, Difference between UDP and TCP – Domain Name System (DNS) – Electronic Mail (Email) – Introduction – E-Mail Transfer protocols – MIME – E-Mail Privacy – Spam in E-Mail and Phishing.                        | 15        |
|          | <b>Total Contact Hrs</b>   | <b>75</b> |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|

**Text Book**

| S.NO | AUTHOR           | TITLE OF THE BOOK                | PUBLISHERS \ EDITION   | YEAR OF PUBLICATION |
|------|------------------|----------------------------------|--|---------------------|
| 1    | Achyut S.Godbole | Data Communications and Networks | 2 <sup>nd</sup> ed. Tata McGraw-Hill Publishing Company Limited, ISBN-13: 978-0-07-047297. | 2017                |

**Reference Books**

| S.NO | AUTHOR              | TITLE OF THE BOOK                  | PUBLISHERS \ EDITION   | YEAR OF PUBLICATION |
|------|---------------------|------------------------------------|--|---------------------|
| 1    | Behrouz A. Forouzan | Data Communications and Networking | 4 <sup>th</sup> Edition, Tata McGraw-Hill Publishing Company Limited, ISBN-13: 978-0070634145. | 2017                |
| 2    | Andrew S. Tanenbaum | Computer Networks                  | 5 <sup>th</sup> Edition, Prentice Hall, ISBN-13: 978-9332518742                                | 2013                |

**Web References**

- |  |
|--|
| 1. <a href="https://onlinecourses.swayam2.ac.in/cec19_cs07/preview">https://onlinecourses.swayam2.ac.in/cec19_cs07/preview</a>   |
| 2. <a href="https://www.tutorialspoint.com/data_communication_computer_network/index.htm">https://www.tutorialspoint.com/data_communication_computer_network/index.htm</a>     |
| 3. <a href="http://www.engppt.com/2009/12/networking-fourouzan-ppt-slides.html">http://www.engppt.com/2009/12/networking-fourouzan-ppt-slides.html</a>                         |
| 4. <a href="https://www.slideshare.net/SalihinNirbhoy/basic-computer-networking-tutorial">https://www.slideshare.net/SalihinNirbhoy/basic-computer-networking-tutorial</a>     |
| 5. <a href="https://www.slideshare.net/HarpreetDhaliwal/presentation-on-data-communication">https://www.slideshare.net/HarpreetDhaliwal/presentation-on-data-communication</a> |

| Course Designed by  | Verified by HOD   | Checked by   | Approved by   |
|---|---|--|---|
| Name and Signature  | Name and Signature  | Co-ordinator CDC   | COE   |
| Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:   | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature: | Name:<br>Mr. K. Srinivasan<br><br>Signature: | Name:<br>Dr. R. Manickachezian<br><br>Signature: |
| <b>Dr. M. RAJASENATHIPATHI</b> M.A., M.C.A., M.Phil., Ph.D.<br>Head of the Department<br>Department of Computer Technology<br>Allamuthu Gowder Mahalingam College (Autonomous)<br>POLLACHI - 642 001. | <b>K. SRINIVASAN</b><br>Co-ordinator<br>Curriculum Development Cell, CDC<br>NGM College (Autonomous)<br>Pollachi - 642 001.         | <b>Dr. R. MANICKACHEZIAN</b> M.Sc., M.Ed.<br>Controller of Examinations<br>NGM College (Autonomous)<br>POLLACHI - 642 001.     |   |

|   |          |                               |    |                         |  |             |
|---|----------|-------------------------------|----|-------------------------|--|-------------|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |    | <b>Programme Title:</b> | Bachelor of Science<br>(Computer Technology) |             |
| <b>Course Code:</b>                                     | 21UCT4A4 |                               |    | <b>Title</b>            | <b>Batch:</b>                                | 2021 – 2024 |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 05       | <b>Tutorial<br/>Hrs./Sem.</b> | 03 | ALLIED IV: BIG          | <b>Semester:</b>                             | IV          |
|   |          |                               |    | DATA<br>MANAGEMENT      | <b>Credits:</b>                              | 04          |

#### Course Objective

1. The students will possess the skills necessary for utilizing tools (including deploying them on Hadoop/ Map Reduce to handle a variety of big data analytics.
2. The students will be able to apply the analytics techniques on a variety of applications.

#### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Keep in mind Evolution of Data Management, Architecture, Structured and Unstructured Data.                                     | K1              |
| CO2       | Comprehend deep knowledge about the Distributed Computing, Digging into Big Data Technology Components, Big Data Applications. | K2              |
| CO3       | Apply techniques of Virtualization, Distributed Computing, Databases, and Columnar Databases in various applications.          | K3              |
| CO4       | Analyze the concepts of Tracing the Origins of Map Reduce, Adding the reduce Function, Analysis and Extraction Techniques.     | K4              |
| CO5       | Evaluate the need and fundamentals of HBase. Apply the Cassandra data model for different applications.                        | K4              |

## Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | L   | H    | H    | H    |
| CO2              | H   | M   | H   | M   | H   | H   | M   | H   | M   | H    | M    | M    |
| CO3              | H   | M   | H   | M   | H   | L   | M   | H   | M   | H    | M    | M    |
| CO4              | M   | H   | L   | H   | M   | M   | H   | M   | H   | M    | H    | M    |
| CO5              | H   | L   | H   | M   | H   | H   | M   | H   | M   | L    | M    | M    |

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

| Units    | Content  | Hrs |
|----------|--|-----|
| Unit I   | <b>Grasping the Fundamentals of Big Data</b> :The Evolution of Data Management - Understanding the waves of Managing Data -Defining Big Data -Building a Successful Big Data Management Architecture <b>Examining Big Data Types</b> : Defining Structured Data- Defining Unstructured Data- Putting Big Data Together.  | 15  |
| Unit II  | <b>Old Meets New- Distributed Computing</b> : A Brief History of Distributed Computing- Understanding the Basics of Distributed Computing- <b>Digging into Big Data Technology Components</b> : Exploring the Big Data Stack- Layer 0: Redundant Physical Infrastructure- Layer 1: Security Infrastructure - Layer 2: Operational Databases- Layer 3: Organizing Data Services and Tools - Layer 4: Analytical Data Warehouses -Big Data Analytics -Big Data Applications. | 15  |
| Unit III | <b>Virtualization and How It Supports Distributed Computing</b> : Understanding the Basics of Virtualization- Importance of virtualization of Big Data. Big Data management: Document Databases: MongoDB -CouchDB . <b>Columnar Databases</b> : Hbase columnar database. /   | 15  |
| Unit IV  | <b>Map Reduce Fundamentals</b> : Tracing the Origins of Map Reduce -Understanding the map Function- Adding the reduce Function -Putting map and reduce Together.   | 15  |
| Unit V   | <b>Understanding Text Analytics and Big Data</b> : Exploring Unstructured Data- Understanding Text Analytics- Analysis and Extraction Techniques - Characteristics of Big data analysis - Characteristics of Big data analysis framework.  | 15  |
|          | <b>Total Contact Hrs</b>   | 75  |



## Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

## Assessment Methods

Seminar, Quiz, Assignments, Group Task.

## Text Book

| S.NO | AUTHOR  | TITLE OF THE BOOK    | PUBLISHERS \ EDITION       | YEAR OF PUBLICATION |
|------|---|----------------------|----------------------------|---------------------|
| 1    | Judith Hurwitz,<br>Alan Nugent,<br>Dr. Fern Haiper<br>and Marcia Kaufman. | Big Data for Dummies | John Wiley & Sons,<br>Inc. | 2013                |

## Reference Books

| S.NO | AUTHOR                                  | TITLE OF THE BOOK  | PUBLISHERS \ EDITION   | YEAR OF PUBLICATION |
|------|---|--|--|---------------------|
| 1    | Bill Franks                             | Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with advanced analytics | John Wiley & sons.   | 2012                |
| 2    | DT Editorial Services                   | Big Data Black Book  | 1 <sup>st</sup> edition,<br>Dreamtech Press.<br>ISBN – 13:<br>9789351197577. | 2015                |
| 3    | Seema Acharya,<br>SubhashiniChellappan, | Big Data and Analytics   | 1 <sup>st</sup> edition, Wiley<br>Publication.                               | 2016                |
| 4    | O'Reilly Media                          | "Big Data now: Current Perspective"  | O'Reilly Media   | 2013                |

Web References

1. <https://www.edureka.co/blog/big-data-tutorial>
2. <http://statweb.stanford.edu/~tibs/ElemStatLearn/>
3. <https://www.coursera.org/learn/big-data-introduction>
4. <https://nptel.ac.in/courses/106/104/106104189/>
5. <http://statweb.stanford.edu/~tibs/ElemStatLearn/>

| Course Designed by  | Verified by HOD  | Checked by   | Approved by  |
|---|--|--|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Dr. R. Jayaprakash<br><br>Signature: | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature: | Name:<br>Mr. K. Srinivasan<br><br>Signature: | Name:<br>Dr. R. Manickachezian<br><br>Signature: |

**Dr. M. RAJASENATHIPATHI** M.A., M.C.A., M.P.N.I., Ph.D.  
 Head of the Department  
 Department of Computer Technology  
 Nallamuthu Gender Mahalingam College (Autonomous)  
 POLLACHI - 642 001.

**K. SRINIVASAN, M.C.A.**  
 Co-ordinator  
 Curriculum Development Cell (CDC)  
 NGM College (Autonomous)  
 Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.**  
 Controller of Examinations  
 NGM College (Autonomous)  
 POLLACHI - 642 001.

|   |          |                               |   |  |  |             |
|---|----------|-------------------------------|---|--|--|-------------|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |   | <b>Programme Title:</b>                      | Bachelor of Science<br>(Computer Technology) |             |
| <b>Course Code:</b>                                     | 21UCT415 |                               |   | <b>Title</b>                                 | <b>Batch:</b>                                | 2021 – 2024 |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 04       | <b>Tutorial<br/>Hrs./Sem.</b> | 0 | LAB - V: ADVANCED<br>JAVA PROGRAMMING<br>LAB | <b>Semester:</b>                             | IV          |
|   |          |                               |   |  | <b>Credits:</b>                              | 02          |

### Course Objective

To build GUI applications and connect to JDBC, create Web applications using server side programming languages – Servlets, JSP and Java beans.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Recollect the concept of Swing Components and cookies                       | K3              |
| CO2       | Understand and integrate Servlets, JDBC and JSP to develop web applications | K4              |
| CO3       | Validate the idea of Java Beans to build enterprise applications            | K3              |
| CO4       | Develop an request object method using enterprise-applications              | K4              |
| CO5       | Illustrate the concept of Server-side Includes and Servlet chaining         | K4              |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | L   | H    | H    | H    |
| CO2              | H   | M   | H   | M   | H   | H   | M   | H   | M   | H    | M    | L    |
| CO3              | H   | M   | H   | M   | H   | L   | M   | H   | M   | H    | M    | H    |
| CO4              | M   | H   | L   | H   | M   | M   | H   | M   | H   | M    | H    | M    |
| CO5              | H   | L   | H   | M   | H   | H   | M   | H   | M   | L    | M    | H    |

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

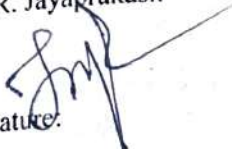
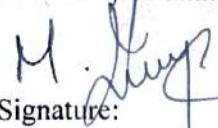


| Content   | Hrs.      |
|---|-----------|
| <b>List of Programs</b> <ol style="list-style-type: none"> <li>1. Create a program to illustrate the concept of Introspection.</li> <li>2. Create a bean program to design a simple property of the bean.</li> <li>3. Create a java program to illustrate the concept of Generic Servlet.</li> </ol>  |           |
| <ol style="list-style-type: none"> <li>4. Create a java program to illustrate the concept of Http Servlet.</li> <li>5. Create a java program to illustrate the concept of Servlet chaining.</li> <li>6. Create a java program to illustrate the concept of Server-side Includes.</li> <li>7. Create a java program to illustrate the concept of Request Object Method.</li> <li>8. Create a java program to illustrate the concept of JDBC Connectivity.</li> <li>9. Create a jsp program to illustrate the concept of Implicit Objects.</li> <li>10. Create a program to illustrate the concept of Sessions in JSP.</li> </ol> | 60        |
| <b>Total Contact Hrs.</b>   | <b>60</b> |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

| Course Designed by  | Verified by HOD  | Checked by   | Approved by  |
|---|--|--|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Dr. R. Jayaprakash<br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature:  | Name:<br>Dr. R. Manickachezian<br>Signature:  |

**Dr. M. RAJASENATHIPATHI**, M.A., M.C.A., M.P.H., Ph.D.      **K. SRINIVASAN**, M.C.A.,

Head of the Department

Co-ordinator

Department of Computer Technology Curriculum Development Cell (CDC)

Kallamuthu Gounder Mahalingam College (Autonomous)      NGM College (Autonomous)

POLLACHI - 642 001.

Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN**, M.Sc., M.S., Ph.D.,

Controller of Examinations

NGM College (Autonomous)

POLLACHI - 642 001.

|  |          |                      |   |  |  |             |  |
|--|----------|----------------------|---|--|--|-------------|--|
| Programme Code:                                | B.Sc. CT |                      |   | Programme Title:                         | Bachelor of Science<br>(Computer Technology) |             |  |
| Course Code:                                   | 21UCT416 |                      |   | Title                                    | Batch:                                       | 2021 - 2024 |  |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 04       | Tutorial<br>Hrs./Sem | 0 | LABVI: LINUX AND SHELL<br>PROGRAMMINGLAB | Semester:                                    | IV          |  |
|  |          |                      |   |  | Credits:                                     | 02          |  |

### Course Objective

To enable the students to write program in Linux for solving specified problems.

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Apply the various Linux distributions.   | K3              |
| CO2       | Evaluate the basic set of commands and utilities in Linux systems.               | K4              |
| CO3       | Validate various shell scripts with different programming concepts.              | K3              |
| CO4       | Apply and change the ownership and file permissions using advance Unix commands. | K4              |
| CO5       | Create shell scripts for real time applications.                                 | K4              |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2              | H   | M   | H   | M   | H   | M   | H   | M   | H   | M    | H    | M    |
| CO3              | H   | M   | H   | M   | H   | M   | H   | M   | H   | M    | H    | M    |
| CO4              | M   | H   | L   | H   | M   | H   | L   | H   | M   | H    | L    | H    |
| CO5              | H   | L   | H   | M   | H   | L   | H   | M   | H   | L    | H    | M    |

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

| Content  | Hrs.      |
|--|-----------|
| <p><b>List of Programs</b></p> <ol style="list-style-type: none"> <li>1. Write a shell script to simulate the file commands: rm, cp, cat, mv, cmp, wc, split</li> <li>2. Write a Shell Script to implement the following: pipes, Redirection and commands.</li> <li>3. Write a shell script for displaying current date, user name, file listing and directories by getting user choice.</li> <li>4. Write a shell script to implement the filter commands.</li> <li>5. Write a shell script to remove the files which has file size as zero bytes.</li> <li>6. Write a shell script to find the sum of the individual digits of a given number.</li> <li>7. Write a shell script to implement command line arguments.</li> <li>8. Write a shell script for executing control statements</li> <li>9. Write a shell script to print the multiplication table of the given argument using for loop.</li> <li>10. Write a shell script to show the following system configuration : <ol style="list-style-type: none"> <li>a. currently logged user and his log name</li> <li>b. current shell , home directory , Operating System type , current Path setting</li> <li>c. show currently logged number of users, show all available shells</li> <li>d. show CPU information like processor type , speed</li> <li>e. show memory information</li> </ol> </li> </ol> | 60        |
| <b>Total Contact Hrs.</b>  | <b>60</b> |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

| Course Designed by  | Verified by HOD  | Checked by  | Approved by  |
|---|--|---|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC  | COE  |
| Name:<br>Ms. A. Kalaivani<br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature:  | Name:<br>Dr. R. Manickachezian<br>Signature:  |

**DR. R. RAJASENATHIPATHI, M.A., M.C.A., M.P.H., M.D.**  
 Head of the Department  
 Department of Computer Technology  
 Nallamathu Gounder Mahalingam College (Autonomous)  
 POLLACHI - 642 001.

**K. SRINIVASAN, M.C.A.**  
 Co-ordinator  
 Curriculum Development Cell (CDC)  
 NGM College (Autonomous)  
 Pollachi - 642 001.

**DR. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.**  
 Controller of Examinations  
 NGM College (Autonomous)  
 POLLACHI - 642 001.



|  |          |                       |                  |   |                                   |
|--|----------|-----------------------|------------------|---|-----------------------------------|
| Programme Code:                                | B.Sc. CT |                       | Programme Title: | Bachelor of Science<br>(Computer Technology)                    |                                   |
| Course Code:                                   | 21UCT4N1 |                       | Title            | Batch:  | 2021 – 2024                       |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 01       | Tutorial<br>Hrs./Sem. | 0                | Skill Based NON-MAJOR<br>ELECTIVE II – OFFICE<br>AUTOMATION LAB | Semester:<br>IV<br>Credits:<br>02 |

### Course Objective

To familiarize the students in preparation of documents and presentations with office automation tools

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Keep in mind about the menus and icons functionalities in MS Word  | K3              |
| CO2       | Understand and apply mathematical functions to calculate mean, median and standard deviation using Excel | K3              |
| CO3       | Apply different build in functions and their usage.  | K4              |
| CO4       | Prepare a power point presentation for a range of events   | K4              |
| CO5       | Include graphs, tables and images to power point presentation  | K3              |

### Mapping

| PO / PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1            | H   | H   | H   | H   | H   | H   | H   | H   | L   | H    | H    | H    |
| CO2            | H   | M   | H   | M   | H   | H   | M   | H   | M   | H    | M    | L    |
| CO3            | H   | M   | H   | M   | H   | L   | M   | H   | M   | H    | M    | H    |
| CO4            | M   | H   | L   | H   | M   | M   | H   | M   | H   | M    | H    | M    |
| CO5            | H   | L   | H   | M   | H   | H   | M   | H   | M   | L    | M    | H    |

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

| Content   | Hrs.      |
|---|-----------|
| <b>MS WORD</b><br>1. Type the text, check spelling and grammar, bullets and numbering list items, align the text to left, right, justify and centre.<br>2. Prepare a job application letter enclosing your bio-data.<br>3. Performing mail merge operation and preparing labels.  |           |
| 4. Preparing a neatly aligned, error free document, add header and footer, also perform find and replace operation.<br>5. Prepare a document in newspaper column layout.<br><b>MS EXCEL</b><br>6. Worksheet Using formulas.<br>7. Worksheet Manipulation for electricity bill preparation.<br>8. Drawing graphs to illustrate class performance.<br>9. An excel worksheet contains monthly Sales Details of five companies.<br><b>MS POWER POINT</b><br>10. Prepare a power point presentation for Department inaugural function. | 15        |
| <b>Total Contact Hrs.</b>   | <b>15</b> |

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

| Course Designed by   | Verified by HOD  | Checked by   | Approved by  |
|--|--|--|--|
| Name and Signature   | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Ms. A. Kalaiyani<br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature:  | Name:<br>Dr. R. Manickachezian<br>Signature:  |

**Dr. M. RAJASENATHIPATHI** M.A, M.C.A, M.PHIL, PH.D  
Head of the Department

**K. SRINIVASAN, M.C.A.**

**Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.**  
Controller of Examinations

Department of Computer Technology  
Nallamuthu Gounder Mahalingam College (Autonomous)  
POLLACHI - 642 001.

Co-ordinator  
Information Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

NGM College (Autonomous)  
POLLACHI - 642 001.

|  |          |                       |   |   |  |             |  |
|--|----------|-----------------------|---|---|--|-------------|--|
| Programme Code:                                | B.Sc. CT |                       |   | Programme Title:  | Bachelor of Science<br>(Computer Technology) |             |  |
| Course Code:                                   | 21UCT4N2 |                       |   | Title   | Batch:                                       | 2021 - 2024 |  |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 01       | Tutorial<br>Hrs./Sem. | 0 | Skill Based NON-MAJOR<br>ELECTIVE II -<br>CORELDRAW LAB | Semester:                                    | IV          |  |
|  |          |                       |   |   | Credits:                                     | 02          |  |

### Course Objective

To equip the students with the basic knowledge of CorelDraw graphics suites

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Keep in mind about CorelDraw workspace, tools and panels                             | K3              |
| CO2       | Comprehend a variety of images using crop tools, zooming, curve and smart fill tools | K4              |
| CO3       | Validate the animation works using CorelDraw   | K3              |
| CO4       | Develop different animations with help of Corel tools                                | K4              |
| CO5       | Create variety of techniques for designing methods                                   | K4              |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | L   | H    | H    | H    |
| CO2              | H   | M   | H   | M   | H   | H   | M   | H   | M   | H    | M    | L    |
| CO3              | H   | M   | H   | M   | H   | L   | M   | H   | M   | H    | M    | H    |
| CO4              | M   | H   | L   | H   | M   | M   | H   | M   | H   | M    | H    | M    |
| CO5              | H   | L   | H   | M   | H   | H   | M   | H   | M   | L    | M    | H    |

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


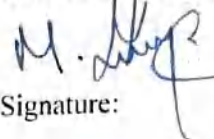
| Content  | Hrs. |
|--|------|
| 1. Create a program using drawing tools.<br>2. Create a program to work with layers<br>3. Develop a program for Text tools<br>4. Create a program to work with frames<br>5. Create a model using Freehand Tool<br>6. Create a program for masking a picture<br>7. Create a program using bitmap files<br>8. Create a program to develop a layers<br>9. Create a program for transformation of an object<br>10. Develop a program for animation effects | 15   |
| <b>Total Contact Hrs.</b>  | 15   |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

| Course Designed by   | Verified by HOD  | Checked by   | Approved by  |
|--|--|--|--|
| Name and Signature   | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Ms. K. S. Leelavathi<br><br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature: <br><b>K. SRINIVASAN, M.C.A.</b> | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

**Dr. M. RAJASENATHIPATHI** M.A., M.C.A., M.P.H., Ph.D.  
Head of the Department  
Department of Computer Technology  
Nallamilli Gounder Mahalingam College (Autonomous)  
POLLACHI - 642 001.

Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.**  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

# **SEMESTER- V**

|   |           |                               |  |                                 |             |
|---|-----------|-------------------------------|--|---------------------------------|-------------|
| <b>Programme Code:</b>                                  | B.Sc. UCT |                               | <b>Programme Title:</b>                        | Bachelor of Computer Technology |             |
| <b>Course Code:</b>                                     | 21UCT517  |                               | <b>Title</b>                                   | <b>Batch:</b>                   | 2021 - 2024 |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 6         | <b>Tutorial<br/>Hrs./Sem.</b> | 2  | <b>Semester:</b>                | V           |
|   |           |                               |  | <b>Credits:</b>                 | 05          |
|   |           |                               | CORE COURSE XI:<br>OPEN SOURCE<br>TECHNOLOGIES |                                 |             |

### Course Objective

To impart basic knowledge of PHP and MySQL and development of web applications using open source web technologies like Apache, MySQL and PHP (LAMP/XAMP).

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Obtaining the basic concepts of PHP  | K1              |
| CO2       | Gain the basic knowledge on Decision making and Looping                                | K1, K2          |
| CO3       | Understand the concept in string manipulation and arrays                               | K1, K3          |
| CO4       | Gain detailed knowledge on MySQL Commands  | K4              |
| CO5       | Obtain knowledge about database manipulation using MySQL and design dynamic web pages. | K5, K6          |

### Mapping

| PO /PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1           | H   | H   | H   | M   | H   | H   | H   | M   | H   | H    | M    | H    |
| CO2           | H   | H   | M   | H   | H   | L   | H   | H   | H   | H    | H    | H    |
| CO3           | H   | M   | H   | H   | H   | H   | L   | H   | H   | H    | H    | M    |
| CO4           | H   | H   | H   | M   | H   | L   | H   | M   | H   | M    | M    | H    |
| CO5           | H   | M   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |

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

| Units                    | Content  | Hrs       |
|--------------------------|--|-----------|
| Unit I                   | <b>Introducing PHP:</b> History – Unique features – Basic Development Concepts – Creating your First PHP Script – Sample Applications. <b>Using Variables and Operators:</b> Storing Data in Variables – Understanding PHP's Data types – Setting and Checking Variable Data Types – Using Constants – Manipulating Variables with Operators – Handling Form Input.                        | 18        |
| Unit II                  | <b>Controlling Program Flow:</b> Writing Simple Conditional Statements – Writing More Complex Conditional Statements – Repeating Actions with Loops – Working with String and Numeric Functions. <b>Working with Arrays:</b> Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms – Working with Array Functions – Working with Dates and Times. | 18        |
| Unit III                 | <b>Using Functions and Classes:</b> Creating User-Defined Functions – Creating Classes – Using Advanced OOP Concepts. <b>Working with Files and Directories:</b> Reading Files – Writing Files – Processing Directories – Performing Other File and Directory Operations.  | 18        |
| Unit IV                  | <b>Working with Databases and SQL:</b> Introducing Databases and SQL – Creating and Populating a Database – Using PHP's MySQLi Extension – Adding or Modifying Data – Handling Errors. Using PHP's SQLite Extension – Using PHP's PDO Extension – Using a MySQL Database – Switching to a different Database.  | 18        |
| Unit V                   | <b>Python Basics:</b> Introduction – Installation – Data types and Data structures –Control flow – Functions – Modules – Packages – File handling – Date/Time – Operations – Classes.  | 18        |
| <b>Total Contact Hrs</b> |  | <b>90</b> |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|

**Text Book**



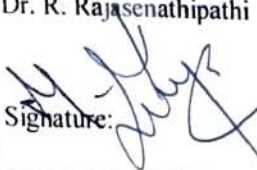
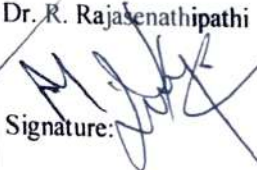

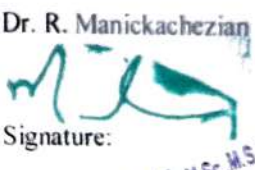
| S.NO | AUTHOR        | TITLE OF THE BOOK       | PUBLISHERS \ EDITION                           | YEAR OF PUBLICATION |
|------|---------------|-------------------------|--|---------------------|
| 1    | VikramVaswani | PHP: A Beginner's Guide | Tata McGraw Hill Publications , Second Reprint | 2012                |

#### Reference Books

| S.NO | AUTHOR                      | TITLE OF THE BOOK   | PUBLISHERS \ EDITION                     | YEAR OF PUBLICATION |
|------|-----------------------------|---|--|---------------------|
| 1    | Alan Forbes                 | The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL | Kindle Edition                           | 2020                |
| 2    | RasmusLerdorf, Kevin Tatroe | Programming PHP   | O'Reilly Media , 3 <sup>rd</sup> Edition | 2013                |
| 3    | Luke Welling; Laura Thomson | PHP and MySQL-Web Development   | 4 <sup>th</sup> Edition                  | 2013                |
| 4    | Robin Nixon                 | Learning PHP, MySQL, JavaScript, CSS & HTML5, Third Edition                                       | O'reilly Media                           | 2014                |

#### Web References

|  |
|--|
| 1. <a href="https://www.tutorialspoint.com/php/">https://www.tutorialspoint.com/php/</a>   |
| 2. <a href="https://www.siteground.com/tutorials/php-mysql/">https://www.siteground.com/tutorials/php-mysql/</a>                               |
| 3. <a href="https://onlinecourses.swayam2.ac.in/aic20_sp32/preview">https://onlinecourses.swayam2.ac.in/aic20_sp32/preview</a>                 |
| 4. <a href="https://www.geeksforgeeks.org/php-mysql-database-introduction/">https://www.geeksforgeeks.org/php-mysql-database-introduction/</a> |
| 5. <a href="https://www.w3schools.com/php/php_mysql_intro.asp">https://www.w3schools.com/php/php_mysql_intro.asp</a>                           |

| Course Designed by   | Verified by HOD  | Checked by   | Approved by  |
|--|--|--|--|
| Name and Signature   | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature:  | Name:<br>Dr. R. Manickachezian<br>Signature:  |

**Dr. M. RAJASENATHIPATHI**  
 Head of the Department  
 Department of Computer Curriculum Development Cell (CDC)  
 Nallamuthu Gounder Mahalingam College  
 POLLACHI - 642 001.

**K. SRINIVASAN, M. COE**  
 Co-ordinator  
 Curriculum Development Cell (CDC)  
 NGM College (Autonomous)  
 Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN, M.Sc. M.S. Ph.D.**  
 Controller of Examinations  
 NGM College (Autonomous)  
 POLLACHI - 642 001.

|   |          |                           |   |   |                                 |             |  |
|---|----------|---------------------------|---|---|---------------------------------|-------------|--|
| <b>Programme Code:</b>                          | B.Sc. CT |                           |   | <b>Programme Title:</b>                     | Bachelor of Computer Technology |             |  |
| <b>Course Code:</b>                             | 21UCT518 |                           |   | <b>Title</b>                                | <b>Batch:</b>                   | 2021 - 2024 |  |
| <b>Lecture Hrs./Week or Practical Hrs./Week</b> | 06       | <b>Tutorial Hrs./Sem.</b> | 2 | CORE COURSE<br>XII:<br>INFORMATION SECURITY | <b>Semester:</b>                | V           |  |
|   |          |                           |   |   | <b>Credits:</b>                 | 05          |  |

### Course Objective

To understand the essentials of information security and learn the algorithms for implementing security.

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Remember and understand the fundamentals of security algorithm in various layers.  | K1, K2          |
| CO2       | Analyze the various symmetric key and public key algorithms  | K4              |
| CO3       | Understand the techniques to secure data in Hash algorithms.   | K2              |
| CO4       | Assess cyber security risk management policies in order to adequately protect critical information and assets.                                 | K3              |
| CO5       | Analyze the various attacks in networks and discover how to protect personal data, securing simple computer networks, and safe Internet usage. | K4              |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | M    | H    |
| CO2              | H   | H   | H   | M   | H   | H   | L   | M   | H   | H    | M    | H    |
| CO3              | H   | H   | L   | H   | H   | M   | H   | H   | H   | H    | H    | H    |
| CO4              | H   | H   | M   | L   | H   | H   | L   | H   | H   | M    | H    | M    |
| CO5              | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |

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

| Units                    | Content  | Hrs       |
|--------------------------|--|-----------|
| Unit I                   | <b>Attacks on Computers and Computer Security:</b> Introduction – Need For Security – Types Of Attacks. <b>Cryptography - Concepts and Techniques:</b> Introduction – Plain Text and Cipher Text – Substitution Techniques – Transposition Techniques – Encryption and Decryption.   | 18        |
| Unit II                  | <b>Symmetric Key Algorithms:</b> Introduction – Algorithm Types – An Overview Of Symmetric Key Cryptography – <b>Data Encryption Standard (DES):</b> How DES Works? <b>Asymmetric Key Algorithms, Digital Signature and RSA:</b> Introduction – An Overview Of Asymmetric Cryptography - The RSA Algorithm.                        | 18        |
| Unit III                 | <b>Digital Certificate and Public Key Infrastructure (PKI):</b> Digital Certificates: Introduction – The Concept of Digital Certificate – Certificate Authority – Technical Details. The PKIX Model. <b>Internet Security Protocols:</b> Introduction – Secure Socket Layer – (SSL) – Secure Hyper Text Transfer Protocol (SHTTP). | 18        |
| Unit IV                  | <b>Email Security: PGP – How PGP Works? – S / MIME: Introduction –</b> Cryptographic Algorithms used in S/MIME – Security in GSM – Security in 3G. <b>User Authentication And Kerberos:</b> Introduction – Authentication Basics – <b>Passwords:</b> Introduction – Clear Text Passwords - Kerberos.                               | 18        |
| Unit V                   | <b>Cryptography in JAVA:</b> Introduction – Cryptographic Solution Using JAVA. <b>Network Security Firewalls and Virtual Private Networks (VPN):</b> Introduction – <b>Fire Walls:</b> Introduction – Types of Firewalls. <b>Virtual Private Networks (VPN) –</b> Intrusion.   | 18        |
| <b>Total Contact Hrs</b> |  | <b>90</b> |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

**Text Book**





| S.NO | AUTHOR      | TITLE OF THE BOOK                 | PUBLISHERS \ EDITION                           | YEAR OF PUBLICATION |
|------|-------------|-----------------------------------|--|---------------------|
| 1    | Atul Kahate | Cryptography and Network Security | McGraw Hill Education, 3 <sup>rd</sup> Edition | 2012                |

**Reference Books**

| S.NO | AUTHOR  | TITLE OF THE BOOK  | PUBLISHERS \ EDITION  | YEAR OF PUBLICATION |
|------|---|--|---|---------------------|
| 1    | Mark Rhodes-Ousley, Roberta Bragg, Keith Strassberg | Network Security: The Complete Reference                   | Tata McGraw-Hill, 1 <sup>st</sup> Edition                   | 2017                |
| 2    | William Stallings                                   | Cryptography and Network Security Principles and Practices | 5 <sup>th</sup> Edition,                                    | 2011                |
| 3    | Brijendrasingh                                      | Network Security and Management                            | PHI Publication, 3 <sup>rd</sup> Edition                    | 2011                |
| 4    | Dr.Michael E. Whitman, Herbert J. Mattord           | Principles and Practices of Information Security           | Course Technology Cengage Learning, 4 <sup>th</sup> edition | 2012                |

**Web References**

|  |
|--|
| 1. <a href="https://onlinecourses.swayam2.ac.in/nou21_cs01/preview">https://onlinecourses.swayam2.ac.in/nou21_cs01/preview</a>   |
| 2. <a href="https://www.tutorialspoint.com/cryptography/index.htm">https://www.tutorialspoint.com/cryptography/index.htm</a>   |
| 3. <a href="https://www.guru99.com/how-to-make-your-data-safe-using-cryptography.html">https://www.guru99.com/how-to-make-your-data-safe-using-cryptography.html</a>       |
| 4. <a href="https://www.gatevidyalay.com/tag/cryptography-and-network-security-tutorial/">https://www.gatevidyalay.com/tag/cryptography-and-network-security-tutorial/</a> |
| 5. <a href="https://www.javatpoint.com/cyber-security-tutorial">https://www.javatpoint.com/cyber-security-tutorial</a>   |

| Course Designed by  | Verified by HOD  | Checked by   | Approved by  |
|---|--|--|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Ms. C. Keerthana<br><br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

Dr. M. RAJASENATHIPATHI, B.A., B.L.S.,  
Head of the Department

Department of Computer Technology  
Nallamuthu Gounder Mahalingam College (Autonomous)  
POLLACHI - 642 001.

**K. SRINIVASAN, MCA**  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN, M.A., M.Ed.**  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

|   |            |                               |                         |                                 |                  |    |
|---|------------|-------------------------------|-------------------------|---------------------------------|------------------|----|
| <b>Programme Code:</b>                                  | B.Sc. C.T. |                               | <b>Programme Title:</b> | Bachelor of Computer Technology |                  |    |
| <b>Course Code:</b>                                     | 20UCT5E1   |                               | <b>Title</b>            | <b>Batch:</b>                   | 2021 - 2024      |    |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 06         | <b>Tutorial<br/>Hrs./Sem.</b> | 2                       | DSE - I : CLOUD<br>COMPUTING    | <b>Semester:</b> | V  |
|   |            |                               |                         |                                 | <b>Credits:</b>  | 06 |

### Course Objective

To impart the Basic Concepts of Cloud Computing and understand the Technologies and Architectures of Cloud Computing.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Tell about the fundamentals of cloud computing.                                 | K1              |
| CO2       | Describe the scaling techniques in computer system and managing the cloud data. | K2              |
| CO3       | Discuss about tracing and exploring cloud services.                             | K2              |
| CO4       | Examine about cloud managing and security.                                      | K3              |
| CO5       | Illustrate about managing desktops and devices in the cloud.                    | K3              |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | M   | H   | H   | H   | M    | H    | M    |
| CO2              | H   | M   | L   | H   | H   | H   | H   | L   | M   | H    | H    | H    |
| CO3              | H   | H   | M   | H   | L   | H   | M   | H   | H   | L    | H    | M    |
| CO4              | H   | H   | H   | H   | H   | H   | H   | H   | H   | M    | H    | H    |
| CO5              | H   | H   | M   | H   | H   | M   | H   | L   | H   | H    | H    | H    |

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

| Units    | Content  | Hrs       |
|----------|--|-----------|
| Unit I   | <b>Introduction to Cloud Computing:</b> Characteristics – Models – Services Examples – Services and Applications. <b>Cloud concepts and Technologies:</b> Virtualization – Load balancing – scalability and elasticity – Deployment – Replication – Monitoring – Software defined Networking – Network function virtualization – MapReduce – Identity and access management - Service level agreements – Billing.  | 18        |
| Unit II  | <b>Cloud services and Platforms:</b> Compute – Storage – Database – Application – Content Delivery – analytics – Deployment and Management – Identity and access Management – Open source Private Cloud Software. <b>Hadoop and MapReduce:</b> Apache Hadoop – MapReduce Job execution – Schedulers – Cluster setup.   | 18        |
| Unit III | <b>Cloud Application Design:</b> Introduction – Design considerations – Reference Architectures – Design methodologies – Data storage approaches. <b>Cloud Application Benchmarking and Tuning:</b> Introduction – Workload Characteristics – Application Performance Metrics – Design Considerations – Benchmarking Tools – Deployment prototyping – Load Testing and Bottleneck Deduction – Hadoop Benchmarking. | 18        |
| Unit IV  | <b>Cloud Security:</b> Introduction – CSA Cloud Security Architecture – Authentication – Authorization – Identity and Access Management – Data Security – Key Management – Auditing. <b>Cloud For Industry, Health Care and Education:</b> Health Care – Energy systems – Transportation systems – Manufacturing Industry – Education.   | 18        |
| Unit V   | <b>Python for Cloud:</b> Amazon web services – Google Platform – Windows Azure – MapReduce – Packages – Web Application Framework – Designing a RESTful Web API  | 18        |
|          | <b>Total Contact Hrs</b>   | <b>90</b> |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|



## Text Book

| S.NO | AUTHOR                            | TITLE OF THE BOOK                      | PUBLISHERS \ EDITION         | YEAR OF PUBLICATION |
|------|-----------------------------------|--|------------------------------|---------------------|
| 1    | ArshdeepBahga,<br>Vijay Madiseti. | Cloud Computing – A Hands-on Approach. | Universities Press Pvt. Ltd. | 2016                |

## Reference Books

| S.NO | AUTHOR   | TITLE OF THE BOOK   | PUBLISHERS \ EDITION                                    | YEAR OF PUBLICATION |
|------|--|---|---|---------------------|
| 1    | Thomas Erl,<br>ZaighamMahmood&Richardoputtini                | Cloud Computing (Concepts, Technology & Architecture)                                       | Prentice Hall Press.                                    | 2013                |
| 2    | Judith Hurwitz,Robin Bloor Marcia Kaufman and Dr. Fernhalper | Cloud Computing For Dummies   | Wiley India Publication Edition                         | 2010                |
| 3    | Prasant Kumar Pattnaik                                       | Fundamentals of Cloud Computing   | Vikas Publishing House                                  | 2014                |
| 4    | RajkimarBuyya.,et.al   | Cloud Computing: Principles and Paradigms   | Wiley publications                                      | 2013                |
| 5    | Michael Miller   | Cloud Computing: Web-Based Applications That Change the way you work and Collaborate Online | Macmillan Computer Publication, 1 <sup>st</sup> Edition | 2008                |

## Web References

|  |
|--|
| 1. <a href="https://www.motc.gov.qa/sites/default/files/cloud_computing_ebook.pdf">https://www.motc.gov.qa/sites/default/files/cloud_computing_ebook.pdf</a> |
| 2. <a href="https://onlinecourses.nptel.ac.in/noc21_cs62/preview">https://onlinecourses.nptel.ac.in/noc21_cs62/preview</a>                                   |
| 3. <a href="https://data-flair.training/blogs/cloud-computing-tutorial/">https://data-flair.training/blogs/cloud-computing-tutorial/</a>                     |
| 4. <a href="https://www.javatpoint.com/cloud-computing-tutorial">https://www.javatpoint.com/cloud-computing-tutorial</a>                                     |
| 5. <a href="https://www.guru99.com/cloud-computing-for-beginners.html">https://www.guru99.com/cloud-computing-for-beginners.html</a>                         |

| Course Designed by                          | Verified by HOD                                | Checked by                               | Approved by                                  |
|---|--|--|--|
| Name and Signature                          | Name and Signature                             | Co-ordinator CDC                         | COE  |
| Name:<br>Ms. K. S. Leelavathi<br>Signature: | Name:<br>Dr. R. Rajasekharipathi<br>Signature: | Name:<br>Mr. K. Srinivasan<br>Signature: | Name:<br>Dr. R. Manickachezian<br>Signature: |

Dr. M. RAJASEKHARIPATHI  
Head of the Department

Department of Computer Science  
Nallamothu Gounder Mahalingam College (Autonomous)

POLLACHI - 642 001

K. SRINIVARAN, M.C.A.,  
Co-ordinator

Curriculum Development Cell (CDC)  
N.G.M. College (Autonomous)  
Pollachi - 642 001.

Dr. R. MANICKACHEZIAN, B.Sc., M.S. P.G.,  
Controller of Examinations  
N.G.M. College (Autonomous)  
POLLACHI - 642 001.

|   |          |                           |   |                                  |                                 |             |  |
|---|----------|---------------------------|---|----------------------------------|---------------------------------|-------------|--|
| <b>Programme Code:</b>                                  | B.Sc. CT |                           |   | <b>Programme Title:</b>          | Bachelor of Computer Technology |             |  |
| <b>Course Code:</b>                                     | 21UCT5E2 |                           |   | <b>Title</b>                     | <b>Batch:</b>                   | 2021 - 2024 |  |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 06       | <b>Tutorial Hrs./Sem.</b> | 2 | DSE - I :<br>EMBEDDED<br>SYSTEMS | <b>Semester:</b>                | V           |  |
|   |          |                           |   |                                  | <b>Credits:</b>                 | 05          |  |

### Course Objective

To emphasize on comprehensive treatment of embedded hardware and real time operating systems along with case studies, in tune with the requirements of Industry.

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Understand the basic concepts in embedded systems  | K1, K2          |
| CO2       | Understand the knowledge on hardware & software components and developing tools in embedded systems. | K2              |
| CO3       | Understand the working of ARM processor and learn to write programs in ARM processor                 | K2              |
| CO4       | Understand the basic concepts of real time operating systems using the concepts of RTOS.             | K2              |
| CO5       | Develop embedded applications  | K3, K6          |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | M   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2              | H   | H   | L   | H   | L   | H   | H   | M   | H   | L    | M    | H    |
| CO3              | H   | M   | H   | H   | H   | M   | H   | H   | H   | H    | H    | H    |
| CO4              | H   | H   | H   | L   | H   | H   | L   | H   | M   | H    | H    | H    |
| CO5              | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |

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

| Units           | Content   | Hrs       |
|-----------------|---|-----------|
| <b>Unit I</b>   | <b>Introduction to Embedded System:</b> Embedded System – Processor Embedded into the System – Embedded Hardware units and Devices in a System – Embedded Software in a system – Examples of embedded system – Embedded system on chip and use of VLSI circuit - Classification of embedded systems – Skills required for an embedded System Designer.  | 18        |
| <b>Unit II</b>  | <b>Devices and buses for device networks:</b> I/O Types and Examples – Serial Communication devices: Synchronous, Iso-Synchronous and Asynchronous communication from serial devices – Parallel Device Ports - Timer and counting devices – Watchdog timer – Real time clock – Network Embedded Systems – Serial Bus Communication Protocol.  | 18        |
| <b>Unit III</b> | <b>Device drivers and Interrupts servicing mechanism:</b> ISR concept - Device drivers – Interrupt servicing mechanism – Context and the periods for context-switching, deadline and interrupt latency – Device Driver Programming: Writing physical device-driving ISRs in a system- Parallel port device drivers.   | 18        |
| <b>Unit IV</b>  | <b>Programming concepts and embedded programming in C and C++:</b> Embedded programming in C++ and in Java. <b>Program modeling concepts in single and multi processor systems:</b> Program Models – DFG Models – State Machine Programming Models for Event-controlled Program Flow – Modeling of Multiprocessor Systems.  | 18        |
| <b>Unit V</b>   | <b>Inter – process communication and synchronization of processes, Threads and Tasks:</b> Multiple processes in an application – Multiple Threads in an application – Tasks- Task States- <b>Real time operating systems:</b> Operating system services – Real time operating systems – Basic Design using RTOS: Principles – RTOS Task scheduling Models, Interrupt Latency and Response of the Tasks as Performance Metrics: Cooperative Scheduling model-Cyclic and Round Robin Scheduling models – Preemptive Scheduling model. | 18        |
|                 | <b>Total Contact Hrs</b>  | <b>90</b> |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|

**Text Book**




| S.NO | AUTHOR    | TITLE OF THE BOOK                                       | PUBLISHERS \ EDITION                 | YEAR OF PUBLICATION |
|------|-----------|---|--------------------------------------|---------------------|
| 1    | Raj Kamal | Embedded Systems – Architecture, Programming and Design | McGraw Hill, 2 <sup>nd</sup> Edition | 2013                |

**Reference Books**

| S.NO | AUTHOR          | TITLE OF THE BOOK                       | PUBLISHERS \ EDITION                                | YEAR OF PUBLICATION |
|------|-----------------|---|---|---------------------|
| 1    | Shibu K V       | Introduction to Embedded Systems        | McGraw Hill Education, 2 <sup>nd</sup> Edition      | 2017                |
| 2    | Lyla B Das      | Embedded Systems-An Integrated Approach | Pearson Edition                                     | 2013                |
| 3    | Elicia White    | Making Embedded Systems                 | O' Reilly Series, SPD                               | 2011                |
| 4    | Daniel W. Lewis | Fundamentals of Embedded Software       | PHI Education Publications, 1 <sup>st</sup> Edition | 2007                |

**Web References**

|  |
|--|
| 1. <a href="https://onlinecourses.nptel.ac.in/noc21_cs09/preview">https://onlinecourses.nptel.ac.in/noc21_cs09/preview</a>   |
| 2. <a href="https://profile.iiita.ac.in/bibhas.ghoshal/IEMB_2018/Lectures/ES_basics.pdf">https://profile.iiita.ac.in/bibhas.ghoshal/IEMB_2018/Lectures/ES_basics.pdf</a>   |
| 3. <a href="https://www.tutorialspoint.com/embedded_systems/index.htm">https://www.tutorialspoint.com/embedded_systems/index.htm</a>   |
| 4. <a href="https://www.javatpoint.com/embedded-system-tutorial">https://www.javatpoint.com/embedded-system-tutorial</a>   |
| 5. <a href="https://www.bharathuniv.ac.in/colleges1/downloads/courseware_eee/Notes/NE1/BEE%20049-%20design%20of%20embedded%20system.pdf">https://www.bharathuniv.ac.in/colleges1/downloads/courseware_eee/Notes/NE1/BEE%20049-%20design%20of%20embedded%20system.pdf</a> |

| Course Designed by  | Verified by HOD   | Checked by  | Approved by  |
|---|---|---|--|
| Name and Signature  | Name and Signature  | Co-ordinator CDC  | COE  |
| Name:<br>Dr. R. Jayaprakash<br><br>Signature:  | Name:<br>Dr. R. Rajaseenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

Dr. M. RAJASEENATHIPATHI, M.A., M.Sc., Ph.D.  
Head of the Department  
Department of Computer Technology  
Vallamthi Gounder Mahalingam College (Autonomous)  
POLLACHI - 642 001

**K. SRINIVASAN, M.C.A.**  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001

|   |          |                               |   |                                 |             |
|---|----------|-------------------------------|---|---------------------------------|-------------|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               | <b>Programme Title:</b>                 | Bachelor of Computer Technology |             |
| <b>Course Code:</b>                                     | 21UCT5E3 |                               | <b>Title</b>                            | <b>Batch:</b>                   | 2021 - 2024 |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 6        | <b>Tutorial<br/>Hrs./Sem.</b> | 2                                       | <b>Semester:</b>                | V           |
|   |          |                               |   | <b>Credits:</b>                 | 05          |
|   |          |                               | DSE - I : MANAGEMENT INFORMATION SYSTEM |                                 |             |

### Course Objective

To inculcate knowledge to students why information systems are so important today for business and as well as educate the role of the major types of information systems in a business environment.

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Tell about the basic concepts and Roles of Management Information Systems        | K1              |
| CO2       | Describe the development of Business strategies, E-Business Models.              | K2              |
| CO3       | Discuss about the Decision Making concepts and Knowledge Management in MIS       | K2              |
| CO4       | Examine the applications in Manufacturing Sector and Service sector in Industry. | K3              |
| CO5       | Illustrate the Enterprise Management System and Information Systems processing.  | K3              |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | M   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2              | H   | H   | L   | L   | H   | H   | H   | M   | H   | M    | L    | H    |
| CO3              | H   | M   | H   | H   | H   | H   | M   | H   | H   | H    | H    | H    |
| CO4              | H   | H   | M   | M   | H   | H   | M   | H   | H   | L    | H    | H    |
| CO5              | H   | H   | H   | H   | L   | H   | H   | H   | M   | H    | H    | H    |

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

| Units    | Content  | Hrs |
|----------|--|-----|
| Unit I   | <b>Introduction to MIS:</b> MIS concept – Definition – Role of MIS – Impact of MIS – MIS and the User – Management as a Control system – MIS: a support to Management – Management Effectiveness and MIS – Organization as a system. <b>Organizational Behaviour Process Management:</b> Planning – Organizing – Staffing – Coordinating – Directing and – Controlling.  | 18  |
| Unit II  | <b>Strategic Management of Business Performance:</b> Essentiality of Strategic Planning – Tools of Planning – Strategic Management of Business Performance – What is Strategy? – Class and Types of Strategies. <b>Electronic Business Technology:</b> Introduction to E-Business – Models of E-Business- Electronic Payment System – Security in E-Business – MIS and E-Business. <b>A tool for business management:</b> Internet and Web Process Management – strategic Management under Web – Web Enabled Business Management – Application system Architecture in Web – MIS in Web Environment.  | 18  |
| Unit III | <b>Decision Making:</b> Decision-making concepts – Decision-making process– Behavioural Concepts in Decision-making – Organizational Decision-making – MIS and Decision-making – Decision Methods Tools and Procedures. <b>Information and Knowledge:</b> Information Concepts – Information: a quality product – Classification of Information – Methods of data and Information Collection – Value of Information – General Model of a Human as an Information Processor. <b>Choice of Information Technology:</b> Nature of IT decision – Strategic Decision – Configuration Design – Evaluation. | 18  |
| Unit IV  | <b>Applications in Manufacturing Sector:</b> Personnel, Financial, Production, Raw Material and Marketing Managements. <b>Applications in Service Sector:</b> Introduction to Service Sector – Creating a Distinctive Service MIS Application in Service Industry – <b>MIS:</b> Service Industry.  | 18  |
| Unit V   | <b>Management of Global Enterprise:</b> Enterprise Management Systems – ERP system – ERP Model and Modules –Benefits of ERP –ERP Product Evolution - ERP Implementation – EMS and MIS. <b>Technology of Information Systems:</b> Introduction – Data Processing – Transaction Processing – Application Processing – Information System processing – Human Factors and User Interface -Real Time Systems and Good Design.   | 18  |
|          | <b>Total Contact Hrs</b>   | 90  |



**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|

**Text Book**


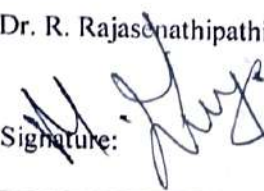


| S.NO | AUTHOR            | TITLE OF THE BOOK                             | PUBLISHERS \ EDITION                         | YEAR OF PUBLICATION |
|------|-------------------|---|--|---------------------|
| 1    | Waman S Jawadekar | Management Information Systems Text and cases | Tata McGraw Hill Publications , 5 th Edition | 2013                |

**Reference Books**

| S.NO | AUTHOR                             | TITLE OF THE BOOK  | PUBLISHERS \ EDITION                | YEAR OF PUBLICATION |
|------|------------------------------------|--|-------------------------------------|---------------------|
| 1    | James A O'Brien & George M Marakas | Management Information Systems                           | Tata McGraw Hill, 10th Edition      | 2014                |
| 2    | Kenneth C Laudon & Jane p.Laudon   | Management Information Systems managing the digital firm | PHI 12th Edition,                   | 2011                |
| 3    | Mahadeo Jaiswal & Monika Mital     | Management Information Systems                           | Oxford University Press 4th Edition | 2004                |

**Web References**

|  |
|--|
| 1. <a href="https://ebooks.lpude.in/management/mba/term_4/DMGT505_MANAGEMENT_INFORMATION_SYSTEM.pdf">https://ebooks.lpude.in/management/mba/term_4/DMGT505_MANAGEMENT_INFORMATION_SYSTEM.pdf</a>   |
| 2. <a href="https://onlinecourses.nptel.ac.in/noc21_mg89/preview">https://onlinecourses.nptel.ac.in/noc21_mg89/preview</a>   |
| 3. <a href="http://www.himpub.com/documents/Chapter963.pdf">http://www.himpub.com/documents/Chapter963.pdf</a>   |
| 4. <a href="https://www.guru99.com/mis-tutorial.html">https://www.guru99.com/mis-tutorial.html</a>   |
| 5. <a href="https://repository.dinus.ac.id/docs/ajar/Kenneth_C.Laudon,Jane_P_.Laudon_Management_Information_System_13th_Edition_.pdf">https://repository.dinus.ac.id/docs/ajar/Kenneth_C.Laudon,Jane_P_.Laudon_Management_Information_System_13th_Edition_.pdf</a> |

| Course Designed by  | Verified by HOD  | Checked by   | Approved by  |
|---|--|--|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Ms. A. Kalaivani<br><br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

Dr. M. RAJASENATHIPATHI, M.A., M.C.A.,  
Head of the Department  
Department of Computer Technology  
Nallamuthu Gounder Mahalingam College  
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

|   |          |                               |   |  |                                 |             |
|---|----------|-------------------------------|---|--|---------------------------------|-------------|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |   | <b>Programme Title:</b>                                | Bachelor of Computer Technology |             |
| <b>Course Code:</b>                                     | 21UCT519 |                               |   | <b>Title</b>   | <b>Batch:</b>                   | 2021 - 2024 |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 5        | <b>Tutorial<br/>Hrs./Sem.</b> | 0 | CORE COURSE LAB –<br>VII - OPEN SOURCE<br>TECHNOLOGIES | <b>Semester:</b>                | V           |
|   |          |                               |   |  | <b>Credits:</b>                 | 02          |

#### Course Objective

To expose students to free open source software environment and introduce them to use open source packages.

To work with open source applications that deal with database and website development.

#### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Write PHP scripts using operators to perform various functions                         | K6              |
| CO2       | Implement different types of PHP functions and the concepts of files and directories   | K3              |
| CO3       | Write regular expressions including modifiers, operators, and meta characters          | K6              |
| CO4       | Create PHP scripts using array   | K6              |
| CO5       | Evaluate the database connectivity using PHP and SQLite and Develop dynamic web pages. | K5, K3          |

#### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | M   | H   | M   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2              | H   | H   | M   | H   | L   | H   | H   | M   | L   | M    | H    | H    |
| CO3              | H   | M   | H   | M   | H   | M   | H   | H   | H   | L    | M    | H    |
| CO4              | H   | H   | M   | H   | L   | H   | M   | L   | M   | H    | H    | M    |
| CO5              | H   | H   | M   | H   | H   | H   | M   | H   | H   | H    | H    | H    |

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

| Content  | Hrs       |
|--|-----------|
| <b>Sample Programs</b> <ol style="list-style-type: none"> <li>1. Develop a PHP Script using the concept of Control Structure &amp; Loops.</li> <li>2. Develop a PHP Script to illustrate the concept of Array.</li> <li>3. Develop a PHP Script to illustrate the concept of Functions.</li> <li>4. Develop a PHP Script to illustrate the concept of Constructor and Destructor.</li> <li>5. Develop a PHP Script to illustrate the concept of Files and Directory.</li> <li>6. Write a PHP Code to make PHP Data Base Connectivity with MYSQL.</li> <li>7. Write a PHP Code to make MYSQL Data Base Operation.</li> <li>8. Develop a PHP Script to make Data Base Operation using MySQLite.</li> <li>9. Develop a PHP Script to illustrate the concept of Cookies</li> <li>10. Develop a PHP Script to illustrate the concept of Sessions</li> </ol> | 75        |
| <b>Total Contact Hrs</b>   | <b>75</b> |

### Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

### Assessment Methods

Seminar, Quiz, Assignments, Group Task.

| Course Designed by                             | Verified by HOD                                | Checked by                               | Approved by                                  |
|--|--|--|--|
| Name and Signature                             | Name and Signature                             | Co-ordinator CDC                         | COE  |
| Name:<br>Dr. R. Rajasenathipathi<br>Signature: | Name:<br>Dr. R. Rajasenathipathi<br>Signature: | Name:<br>Mr. K. Srinivasan<br>Signature: | Name:<br>Dr. R. Manickachezian<br>Signature: |

Head of the Department  
 Department of Computer Technology  
 Nallamothu Gounder Mahalingam College  
 POLLACHI - 642 001.  
**Course Objective**  
**K. SRINIVASAN, M.C.A.**  
 Co-ordinator  
 Curriculum Development Cell (CDC)  
 NGM College (Autonomous)  
 Pollachi - 642 001.

NGM College (Autonomous)  
 POLLACHI - 642 001.

| Content  |           |                    |   | Hrs                             |
|--|-----------|--------------------|---|---------------------------------|
| Programme Code:                                | B.Sc. C.T |                    |   | Bachelor of Computer Technology |
| Course Code:                                   | 21UC1520  |                    |   | Batch: 2021 - 2024              |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 4         | Tutorial Hrs./Sem. | 0   | Semester: V                     |
|  |           |                    | CORE COURSE<br>LAB – VIII -WEB<br>DESIGNING | Credits: 02                     |

To create tables and frames, ordered and unordered lists within a web page and learn the language of HTML, DHTML, XML and JavaScript.

To develop dynamic web page using scripting languages and various XML, HTML5 where scripting codes are embedded into HTML document for interactive presentation effect.

#### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Analyze a web page and identify its elements and attributes        | K3              |
| CO2       | Create a HTML page with formatting text tags, tables and lists     | K6              |
| CO3       | Create a HTML file with Frames                                     | K6              |
| CO4       | Create web pages using DHTML and XML documents                     | K6              |
| CO5       | Build dynamic web pages using JavaScript (client side programming) | K3, K6          |

#### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2              | H   | H   | H   | H   | H   | L   | H   | M   | H   | H    | H    | H    |
| CO3              | H   | M   | H   | H   | H   | H   | L   | H   | H   | H    | H    | H    |
| CO4              | H   | H   | M   | H   | M   | H   | H   | L   | H   | M    | H    | H    |
| CO5              | H   | H   | H   | H   | H   | H   | H   | H   | L   | H    | H    | H    |

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

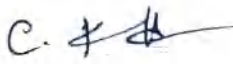
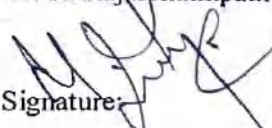
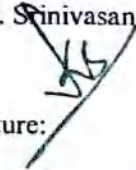
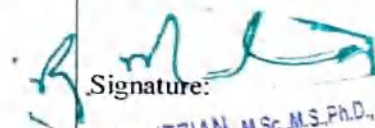
| Sample Programs  |    |
|--|----|
| <ol style="list-style-type: none"> <li>1. Develop static webpages using HTML tags.</li> <li>2. Prepare a webpage using OL &amp; UL.</li> <li>3. Prepare Frames which includes four html programs using frames.</li> <li>4. Design and Develop webpage with the help of HTML and CSS.</li> <li>5. Develop webpage using event handling in javascript</li> <li>6. Embedding Javascript in HTML pages.</li> <li>7. Create a home page using xml.</li> <li>8. Writing XML web Documents which make use of XML Declaration, Element Declaration, Attribute Declaration</li> <li>9. Usage of Internal DTD, External DTD, Entity Declaration.</li> <li>10. Create a web page using image files, which switch between one another as the mouse Pointer moves over the images.</li> </ol> | 60 |
| <b>Total Contact Hrs</b>   |    |
| <b>60</b>  |    |

### Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

### Assessment Methods

Seminar, Quiz, Assignments, Group Task.

| Course Designed by  | Verified by HOD  | Checked by  | Approved by  |
|---|--|---|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC  | COE  |
| Name:<br>Ms. C. Keerthana<br><br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

Dr. M. RAJASENATHIPATHI, Head of the Department  
 Department of Computer Science  
 Nallamuthu Gounder Mahalingam College (Autonomous)  
 POLLACHI - 642 001

K. SRINIVASAN, M.C.C., Co-ordinator  
 Curriculum Development Cell  
 NGMC College (Autonomous)  
 Pollachi - 642 001.

Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,  
 Controller of Examinations  
 NGM College (Autonomous)  
 POLLACHI - 642 001.

|   |          |                               |    |   |  |             |
|---|----------|-------------------------------|----|---|--|-------------|
| <b>Programme Code:</b>                                      | B.Sc. CT |                               |    | <b>Programme Title:</b>                                 | Bachelor of Science<br>(Computer Technology) |             |
| <b>Course Code:</b>   | 21UCT5AL |                               |    | <b>Title</b>  | <b>Batch:</b>                                | 2021 – 2024 |
|   |          |                               |    | Advanced<br>Learner Course - I<br>: SOFTWARE<br>TESTING | <b>Semester</b><br>:                         | V           |
| <b>Lecture Hrs./Week<br/>or<br/>Practical<br/>Hrs./Week</b> | SS       | <b>Tutorial<br/>Hrs./Sem.</b> | SS |   | <b>Credits:</b>                              | 04          |

### Course Objective

To study fundamental concepts in software testing and discuss various software testing issues and solutions in software unit test, integration and system testing.

To List a range of different software testing techniques and strategies and be able to apply specific automated unit testing method to the projects.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Understand the basic concepts and the processes that lead to software testing     | K2              |
| CO2       | Design test cases from the given requirements using Black box testing techniques  | K3              |
| CO3       | Identify the test cases from Source code by means of white box testing techniques | K3              |
| CO4       | Know about user acceptance testing and generate test cases for it                 | K4              |
| CO5       | Examine the test adequacy criteria to complete the testing process                | K5              |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | M   | H    | H    | H    |
| CO2              | H   | M   | H   | L   | H   | H   | H   | M   | L   | H    | H    | H    |
| CO3              | H   | H   | M   | H   | L   | H   | M   | H   | H   | H    | H    | H    |
| CO4              | H   | H   | H   | M   | H   | M   | H   | L   | H   | H    | H    | H    |
| CO5              | H   | H   | H   | H   | M   | H   | L   | H   | H   | H    | H    | H    |

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

| Units    | Content   | Hrs |
|----------|---|-----|
| Unit I   | Software Development Life Cycle models: Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. White-Box Testing: Static Testing – Structural Testing – Challenges in White-Box Testing.                            | SS  |
| Unit II  | Black-Box Testing: What is Black-Box Testing? - Why Black-Box Testing? – When to do BlackBox Testing? – How to do Black-Box Testing? – Challenges in White Box Testing - Integration Testing: Integration Testing as Type of Testing – Integration Testing as a Phase f Testing – Scenario Testing – Defect Bash.                               |     |
| Unit III | System and Acceptance Testing: system Testing Overview – Why System testing is done? – Functional versus Non-functional Testing - Functional testing - Non-functional Testing – Acceptance Testing – Summary of Testing Phases.   |     |
| Unit IV  | Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. Regression Testing: What is Regression Testing? – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing. |     |
| Unit V   | Test Planning, Management, Execution and Reporting: Test Planning – Test Management – Test Process – Test Reporting –Best Practices. Test Metrics and Measurements: Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics   |     |
|          | (*SS – Self Study)Total Contact Hrs   | SS  |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|



## Text Book

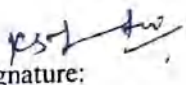
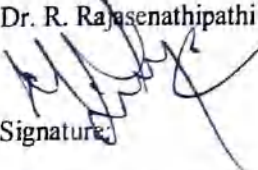


| S.NO | AUTHOR                                   | TITLE OF THE BOOK                                 | PUBLISHERS \ EDITION           | YEAR OF PUBLICATION |
|------|--|---|--------------------------------|---------------------|
| 1    | Srinivasan Desikan and Gopalswamy Ramesh | Software Testing Principles and Practices         | Pearson Education              | 2012                |
| 2    | Limaye M.G                               | Software Testing Principles, Techniques and Tools | Second Reprint, TMH Publishers | 2010.               |

## Reference Books

| S.NO | AUTHOR                    | TITLE OF THE BOOK                     | PUBLISHERS \ EDITION     | YEAR OF PUBLICATION |
|------|---------------------------|---------------------------------------|--------------------------|---------------------|
| 1    | William E. Perry,         | Effective Methods of Software Testing | Wiley India, 3rd ed,     | 2017                |
| 2    | Renu Rajani, Pradeep Oak, | Software Testing                      | TMH, 3 <sup>rd</sup> ed, | 2014                |

## Web References

|  |
|--|
| 1. <a href="https://nptel.ac.in/courses/106/101/106101163/">https://nptel.ac.in/courses/106/101/106101163/</a>   |
| 2. <a href="https://www.guru99.com/software-testing-seven-principles.html">https://www.guru99.com/software-testing-seven-principles.html</a>   |
| 3. <a href="https://www.geeksforgeeks.org/software-engineering-seven-principles-of-software-testing/">https://www.geeksforgeeks.org/software-engineering-seven-principles-of-software-testing/</a>   |
| 4. <a href="http://www.cse.hcmut.edu.vn/~hiep/KiemthuPhanmem/Tailieuthamkhaio/Introduction%20to%20Software%20Testing.pdf">http://www.cse.hcmut.edu.vn/~hiep/KiemthuPhanmem/Tailieuthamkhaio/Introduction%20to%20Software%20Testing.pdf</a> |
| 5. <a href="https://www.tutorialspoint.com/software_testing/index.htm">https://www.tutorialspoint.com/software_testing/index.htm</a>   |

| Course Designed by  | Verified by HOD  | Checked by   | Approved by  |
|---|--|--|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Ms. K.S.Leelavathi<br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature:  | Name:<br>Dr. R. Manickachezian<br>Signature: <br>Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,<br>Controller of Examinations<br>NGM College (Autonomous)<br>POLLACHI - 642 001. |
| Dr. N. KRISHNAN<br>Head of the Department<br>Department of Computer Technology<br>Pollachi                                    | Dr. R. MANICKACHEZIAN<br>Co-ordinator<br>Department of Computer Technology<br>Pollachi   | Dr. R. MANICKACHEZIAN<br>Co-ordinator<br>Department of Computer Technology<br>Pollachi                                       |  |

|  |          |                       |   |                                    |  |             |  |
|--|----------|-----------------------|---|------------------------------------|--|-------------|--|
| Programme Code:                                | B.Sc. CT |                       |   | Programme Title:                   | Bachelor of Science<br>(Computer Technology) |             |  |
| Course Code:                                   | 21UCT5VA |                       |   | Title                              | Batch:                                       | 2021 – 2024 |  |
| Lecture Hrs./Week<br>or<br>Practical Hrs./Week | 01       | Tutorial<br>Hrs./Sem. | - | VAC I- IoT<br>(Internet<br>Things) | Semester:                                    | V           |  |
|  |          |                       |   |                                    | Credits:                                     | 2           |  |

### Course Objective

To imparts a sound understanding of the basic electronics, microcontroller architectures, sensors, IoT architecture and communication protocols.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Understand the scope of the IoT system, architectures, components and supporting technologies.                                | K2              |
| CO2       | Analyzing existing business processes to understand and build technical strategy to develop need aligned technical solutions. | K3              |
| CO3       | Apply decision and repetition structures in program design.   | K3              |
| CO4       | Implement architecture of its networks, devices, programming, data and security.  | K4              |
| CO5       | Evaluate the data received through sensors in IOT and Design smart city in IOT.   | K5              |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | L   | H    | H    | H    |
| CO2              | H   | M   | H   | M   | H   | H   | M   | H   | M   | H    | M    | H    |
| CO3              | H   | M   | H   | M   | H   | L   | M   | H   | M   | H    | M    | H    |
| CO4              | M   | H   | L   | H   | M   | M   | H   | M   | H   | M    | H    | L    |
| CO5              | H   | L   | H   | M   | H   | H   | M   | H   | M   | H    | L    | H    |

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

| Units    | Content  | Hrs       |
|----------|--|-----------|
| Unit I   | <b>Introduction:</b> Definition and characteristics of IoT – IoT enabling Technologies. IoT Levels – <b>Domain Specific IoTs:</b> Home Automation – Cities – Environment.  | 10        |
| Unit II  | <b>IoT and M2M:</b> Introduction - M2M – Difference between IoT and M2M – Need for IoT system management.  | 10        |
| Unit III | <b>IoT platform design methodology:</b> Introduction -IoT design methodology.<br><b>IoT Physical devices and End points:</b> What is an IoT Device? – Basic building blocks of an IoT device – Exemplary device: Raspberry Pi – About the Board. | 10        |
|          | <b>Total Contact Hrs</b>   | <b>30</b> |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|

**Text Book**

| S.NO | AUTHOR                            | TITLE OF THE BOOK                           | PUBLISHERS \ EDITION         | YEAR OF PUBLICATION |
|------|-----------------------------------|---|------------------------------|---------------------|
| 1    | Vijay Madiseti and Arshdeep Bahga | Internet of Things<br>(A Hands-on-Approach) | 1 <sup>st</sup> Edition, VPT | 2017                |

## References Books

| S.NO | AUTHOR           | TITLE OF THE BOOK   | PUBLISHERS \ EDITION                           | YEAR OF PUBLICATION |
|------|------------------|---|--|---------------------|
| 1    | Francis da Costa | Rethinking the Internet of Things: A Scalable Approach to Connecting Everything | 1 <sup>st</sup> Edition, A press Publications. | 2015                |

21UCT5VA

## Web References

|  |
|--|
| 1. <a href="https://electronics-project-hub.com/send-data-to-thingspeak-using-esp8266/">https://electronics-project-hub.com/send-data-to-thingspeak-using-esp8266/</a>                           |
| 2. <a href="https://www.instructables.com/id/ESP8266-to-IFTTT-Using-Arduino-IDE/">https://www.instructables.com/id/ESP8266-to-IFTTT-Using-Arduino-IDE/</a>                                       |
| 3. <a href="https://virtronics.com.au/Simulator-for-Arduino.html">https://virtronics.com.au/Simulator-for-Arduino.html</a>   |
| 4. <a href="https://www.slideshare.net/MohanKumarG/internetofthings-iot-aseminar-ppt-by-mohankumarg">https://www.slideshare.net/MohanKumarG/internetofthings-iot-aseminar-ppt-by-mohankumarg</a> |
| 5. <a href="https://blog.infodiagram.com/2019/07/explain-internet-of-things-powerpoint.html">https://blog.infodiagram.com/2019/07/explain-internet-of-things-powerpoint.html</a>                 |

| Course Designed by  | Verified by HOD  | Checked by   | Approved by   |
|---|--|--|---|
| Name and Signature  | Name and Signature   | Co-ordinator CDC   | COE   |
| Name:<br>Ms. K. S. Leelavathi<br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature:  | Name:<br>Dr. R. Manickachezian<br>Signature:  |

Dr. M. RAJASENATHIPATHI, M.A., M.Ed., M.Phil., Ph.D.  
Head of the Department  
Department of Computer Technology  
Nallamuthu Gounder Mahalingam College  
POLLACHI - 642 001.

K. SRINIVASAN, M.Phil., Ph.D.  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

|   |          |                          |   |   |                                 |             |  |
|---|----------|--------------------------|---|---|---------------------------------|-------------|--|
| <b>Programme Code:</b>                          | B.Sc. CT |                          |   | <b>Programme Title:</b>                         | Bachelor of Computer Technology |             |  |
| <b>Course Code:</b>                             | 21UCT5S1 |                          |   | <b>Title</b>                                    | <b>Batch:</b>                   | 2021 - 2024 |  |
| <b>Lecture Hrs./Week or Practical Hrs./Week</b> | 2        | <b>Tutorial Hrs./Sem</b> | 0 | <b>Skill Based Major Elective I: PYTHON LAB</b> | <b>Semester:</b>                | V           |  |
|   |          |                          |   |   | <b>Credits:</b>                 | 03          |  |

### Course Objective

To understand the basic logic statements, Strings, Lists, Dictionaries and Learn Syntax and Semantics of Python

To Build GUI applications and create Functions in python

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Remembering the concept of operators, data types, looping statements in python programming. | K1              |
| CO2       | Understanding the concepts of Input / Output operations in file.                            | K2              |
| CO3       | Apply and implement python concept with simple program.                                     | K3              |
| CO4       | Analyze the use control structures in programming.  | K4              |
| CO5       | Design Python scripting language to develop innovative real time applications.              | K6              |

### Mapping

| PO / PSO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1           | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2           | H   | H   | H   | H   | H   | H   | H   | M   | H   | L    | H    | H    |
| CO3           | H   | M   | H   | H   | M   | H   | L   | H   | M   | H    | H    | H    |
| CO4           | H   | H   | M   | H   | H   | L   | H   | H   | L   | M    | H    | H    |
| CO5           | H   | H   | H   | M   | H   | H   | H   | H   | H   | H    | H    | H    |

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



|   |          |                          |   |  |                                 |             |  |
|---|----------|--------------------------|---|--|---------------------------------|-------------|--|
| <b>Programme Code:</b>                          | B.Sc. CT |                          |   | <b>Programme Title:</b>                      | Bachelor of Computer Technology |             |  |
| <b>Course Code:</b>                             | 21UCT5S1 |                          |   | <b>Title</b>                                 | <b>Batch:</b>                   | 2021 – 2024 |  |
| <b>Lecture Hrs./Week or Practical Hrs./Week</b> | 2        | <b>Tutorial Hrs./Sem</b> | 0 | <b>SEC : Naan Mudhalvan : I – PYTHON LAB</b> | <b>Semester:</b>                | V           |  |
|   |          |                          |   |  | <b>Credits:</b>                 | 03          |  |

### Course Objective

To understand the basic logic statements, Strings, Lists, Dictionaries and Learn Syntax and Semantics of Python

To Build GUI applications and create Functions in python

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Remembering the concept of operators, data types, looping statements in python programming. | K1              |
| CO2       | Understanding the concepts of Input / Output operations in file.                            | K2              |
| CO3       | Apply and implement python concept with simple program.                                     | K3              |
| CO4       | Analyze the use control structures in programming.  | K4              |
| CO5       | Design Python scripting language to develop innovative real time applications.              | K6              |

### Mapping

| PO / PSO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1           | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2           | H   | H   | H   | H   | H   | H   | H   | M   | H   | L    | H    | H    |
| CO3           | H   | M   | H   | H   | M   | H   | L   | H   | M   | H    | H    | H    |
| CO4           | H   | H   | M   | H   | H   | L   | H   | H   | L   | M    | H    | H    |
| CO5           | H   | H   | H   | M   | H   | H   | H   | H   | H   | H    | H    | H    |

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

| Content   | Hrs       |
|---|-----------|
| <b>Sample Programs</b><br>1. Write a program to demonstrate basic data type in python.<br>2. Exercise programs on operators & I/O operations.<br>3. Exercise program on basic control structures & loops.<br>4. Exercise programs on functions.<br>5. Simple programming for one dimensional and two dimensional arrays.<br>6. Write a Python code to explore string functions.<br>7. Demonstrate the use of Lists, Dictionaries.<br>8. Write a program to implement Tuples.<br>9. Exercise programs on files.<br>10. Exercise programs on Exception handling concepts. | 30        |
| <b>Total Contact Hrs</b>  | <b>30</b> |

### Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

### Assessment Methods

Seminar, Quiz, Assignments, Group Task.

| Course Designed by  | Verified by HOD   | Checked by   | Approved by   |
|---|---|--|---|
| Name and Signature  | Name and Signature  | Co-ordinator CDC   | COE   |
| Name:<br>Dr. R. Jayaprakash<br><br>Signature:                                    | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature: | Name:<br>Mr. K. Srinivasan<br><br>Signature: | Name:<br>Dr. R. Manickachezian<br><br>Signature: |
| Dr. R. RAJASENATHIPATHI, M.A., M.Ed.<br>Head of the Department<br>Department of Computer Technology<br>Kaliamangal Gounder Mahalingam College<br>POLLACHI - 642 001 |   | K. SRINIVASAN, M.C.A.<br>Co-ordinator<br>Curriculum Development Cell (CDC)<br>NGM College (Autonomous)<br>Pollachi - 642 001.    | Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.<br>Controller of Examinations<br>NGM College (Autonomous)<br>POLLACHI - 642 001.            |



|  |          |                          |   |  |                                 |             |  |
|--|----------|--------------------------|---|--|---------------------------------|-------------|--|
| <b>Programme Code:</b>                                       | B.Sc. CT |                          |   | <b>Programme Title:</b>                                    | Bachelor of Computer Technology |             |  |
| <b>Course Code:</b>  | 21UCT5S2 |                          |   | <b>Title</b>   | <b>Batch:</b>                   | 2021 - 2024 |  |
| <b>Lecture Hrs./Week</b><br>or<br><b>Practical Hrs./Week</b> | 2        | <b>Tutorial Hrs./Sem</b> | 0 | <b>SEC : Naan Mudhalvan I<br/>- HTML5 WITH CSS<br/>LAB</b> | <b>Semester:</b>                | V           |  |
|  |          |                          |   |  | <b>Credits:</b>                 | 03          |  |

### Course Objective

To get knowledge and practical skill to create dynamic web applications.

To develop an ability to design and implement static and dynamic website.

To Design and develop a Web site using text, images, links, lists, and tables for navigation and layout.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Remember and Understand the internet related concepts that are vital in understanding web development to create Dynamic Web Applications. | K1, K2          |
| CO2       | Evaluate Several Alternatives in the Design of a Web Application.   | K5              |
| CO3       | Understand the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.               | K3              |
| CO4       | Comprehend and Propose Web Application Infrastructure and Develop A Functional Web Application.   | K2, K3          |
| CO5       | Design and develop web pages using CSS styles, internal and/or external style sheets.   | K3, K6          |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | L   | H   | H   | H   | H    | H    | H    |
| CO2              | H   | M   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO3              | H   | H   | M   | H   | L   | H   | M   | H   | H   | L    | H    | H    |
| CO4              | H   | H   | H   | H   | M   | H   | L   | H   | M   | H    | H    | H    |
| CO5              | H   | H   | M   | H   | H   | H   | H   | H   | H   | H    | M    | H    |

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


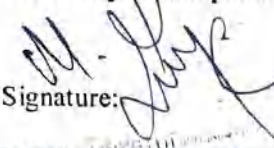


| Content  | Hrs       |
|--|-----------|
| <b>Sample Programs</b> <ol style="list-style-type: none"> <li>1. Write HTML code to develop a static web page having the background and title page in any other color.</li> <li>2. Create a page to show different attribute of Font tags and italic, bold, underline.</li> <li>3. Create a page to show different attribute Design a Signup form with validation using HTML5.</li> <li>4. Create a webpage with HTML5, Use paragraph and list tags.</li> <li>5. Design a webpage and display it using HTML in tabular format.</li> <li>6. Design a CSS to create menu.</li> <li>7. Create a web page using all the attributes of the frame</li> <li>8. Write a program to draw any shape using canvas tag.</li> <li>9. Write a program to include video/Audio file in HTML5 page</li> <li>10. Write a program to Drag and Drop the content in HTML5.</li> </ol> | 30        |
| <b>Total Contact Hrs</b>   | <b>30</b> |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|

| Course Designed by  | Verified by HOD   | Checked by  | Approved by  |
|---|---|---|--|
| Name and Signature  | Name and Signature  | Co-ordinator CDC  | COE  |
| Name:<br>Ms. A. Kalaivani<br><br>Signature:  | Name:<br>Dr. R. Rajaseenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

Dr. M. RAJASENATHIPATHI  
Head of the Department  
Department of Computer Technology  
College (Autonomous)  
Pollachi - 642 001

R. SRINIVASAN, M.C.A.  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

Dr. R. MANICKACHEZIAN, M.Sc. M.S. Ph.D.,  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

# **SEMESTER- VI**

|   |          |                           |    |  |                                 |             |  |
|---|----------|---------------------------|----|--|---------------------------------|-------------|--|
| <b>Programme Code:</b>                          | B.Sc. CT |                           |    | <b>Programme Title:</b>                | Bachelor of Computer Technology |             |  |
| <b>Course Code:</b>                             | 21UCT621 |                           |    | <b>Title</b>                           | <b>Batch:</b>                   | 2021 – 2024 |  |
| <b>Lecture Hrs./Week or Practical Hrs./Week</b> | 06       | <b>Tutorial Hrs./Sem.</b> | 08 | CORE COURSE XIII: FRAMEWORK TECHNOLOGY | <b>Semester:</b>                | VI          |  |
|   |          |                           |    |  | <b>Credits:</b>                 | 04          |  |

### Course Objective

To provide in depth knowledge on VB.NET and ASP.NET and making them to develop dynamic web applications, websites using window controls and web controls.

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Understand the basic concepts of .NET framework and its components.            | K1 / K2         |
| CO2       | Acquire the usage of various Elements of VB.Net to develop programs using them | K3              |
| CO3       | Implement lists and loops with VB.NET controls and iteration                   | K3              |
| CO4       | Assemble multiple forms, modules, and menus into working VB.NET solutions      | K3/K4           |
| CO5       | Connect database by using ADO.NET and manipulate the database                  | K4/K5           |

### Mapping

| PO /PSO<br>CO | PO 1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|---------------|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1           | H    | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2           | H    | M   | H   | M   | H   | M   | H   | H   | M   | L    | H    | M    |
| CO3           | H    | M   | L   | M   | H   | M   | H   | H   | M   | M    | H    | M    |
| CO4           | M    | H   | M   | H   | M   | H   | M   | L   | H   | H    | M    | H    |
| CO5           | H    | M   | H   | M   | H   | M   | H   | H   | M   | M    | H    | M    |

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

| Units    | Content  | Hrs |
|----------|--|-----|
| Unit I   | <b>Introduction to Visual Basic .NET:</b> Visual Basic .NET- Introduction to Microsoft.NET- .NET Framework and the common language runtime. Introduction to the Visual Studio.NET IDE: Introduction – Overview of the visual studio .NET IDE - Menu bar and Toolbar –Visual Studio.NET IDE windows. <b>Introduction to Visual Basic Programming:</b> Introduction – simple programs – memory concepts- Arithmetic - Decision Making – Using a dialog to display a message.   | 18  |
| Unit II  | <b>Control Structures:</b> Introduction – Control Structures- if/then selection structure- if/then/else Selection Structure – While, Do while/loop, Do Until/Loop Repetition Structures –Assignment Operators* – For Next – Select Case – do/loop while – do/loop until – exit key word – logical operators.<br><b>Procedures:</b> Introduction – Modules, classes and procedures – sub procedures – <u>function</u> procedures – methods – Arguments Promotion – Option Strict and Data type conversions – value types and reference types – passing arguments: pass – by-value vs. pass-by-reference – duration of identifiers – scope rules.    | 18  |
| Unit III | <b>Arrays:</b> Introduction - arrays - declaring and allocating arrays - examples - passing arrays to procedures - By Val vs By Ref. – for each/next repetition structure.<br><b>Graphical user interface concepts:</b> Introduction – windows forms – event handling model – control properties and layout – labels, textboxes and buttons – group boxes and panels – checkboxes and radio buttons* – picture boxes – mouse event handling – keyboard event handling.<br>Menus – Link labels – List boxes and checked list boxes – Combo boxes – Tree views – List views – Tab control –MDI windows – Visual inheritance – User defined controls. | 18  |
| Unit IV  | <b>Database, SQL and ADO.NET:</b> Introduction – relational database model- SQL – ADO.NET object model – programming with ADO.NET – extracting from a database – modifying a database  | 18  |
| Unit V   | <b>ASP.NET, web forms and web controls:</b> Introduction – simple HTTP transaction – system architecture – web controls – session tracking   | 18  |
|          | <b>Total Contact Hrs</b>   | 90  |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

**Text Book**


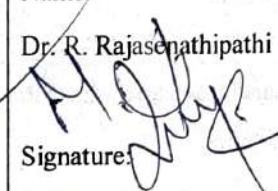
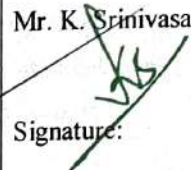

| S.NO | AUTHOR                               | TITLE OF THE BOOK               | PUBLISHERS \ EDITION                           | YEAR OF PUBLICATION |
|------|--------------------------------------|---------------------------------|--|---------------------|
| 1    | Deitel H.M, Deitel P.J,<br>Nieto T.R | Visual Basic.NET How to Program | Pearson Education ,<br>6 <sup>th</sup> Edition | 2012                |

**Reference Books**

| S.NO | AUTHOR                               | TITLE OF THE BOOK   | PUBLISHERS \ EDITION                | YEAR OF PUBLICATION |
|------|--------------------------------------|---|-------------------------------------|---------------------|
| 1    | Kogent Learning Solutions Inc.,      | .Net 3.5 Programming: Covering.Net Framework                      | 1st Edition , DreamTech Press.      | 2015                |
| 2    | Bill Evjen, Jason Beres, et.al,      | Visual Basic.Net Programming – Black Book                         | 2nd Edition , John Wiley & Sons     | 2014                |
| 3    | Gary B. Shelly<br>Thomas J. Cashman, | Microsoft Visual Basic. Net Comprehensive Concepts And Techniques | Cengage Learning India ,1st Edition | 2016                |

**Web References**

|  |
|--|
| 1. <a href="https://www.w3schools.com/asp/">https://www.w3schools.com/asp/</a>   |
| 2. <a href="https://www.tutorialspoint.com/vb.net">https://www.tutorialspoint.com/vb.net</a>                               |
| 3. <a href="https://www.nptelvideos.com/visualbasic_net/?pn=1">https://www.nptelvideos.com/visualbasic_net/?pn=1</a>       |
| 4. <a href="https://www.javatpoint.com/vb-net-control-statements">https://www.javatpoint.com/vb-net-control-statements</a> |
| 5. <a href="https://www.tutorialspoint.com/ASP.net">https://www.tutorialspoint.com/ASP.net</a>                             |

| Course Designed by   | Verified by HOD  | Checked by   | Approved by  |
|--|--|--|--|
| Name and Signature   | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature:  | Name:<br>Dr. R. Manickachezian<br>Signature: <br>Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,<br>Controller of Examinations |

Dr. M. RAJASENATHIPATHI, M.A., M.C.A., M.P.N.I., Ph.D.

Head of the Department

Department of Computer Science

Nallamuthu Gounder Mahalingam College (Autonomous)

POLLACHI - 642 001.

Co-ordinator

Curriculum Development Cell (CDC).

NGM College (Autonomous)

Pollachi - 642 001.

NGM College (Autonomous)  
POLLACHI - 642 001.

|   |          |                               |   |                                     |  |             |  |
|---|----------|-------------------------------|---|-------------------------------------|--|-------------|--|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |   | <b>Programme Title:</b>             | Bachelor of Science<br>(Computer Technology) |             |  |
| <b>Course Code:</b>                                     | 21UCT6E1 |                               |   | <b>Title</b>                        | <b>Batch:</b>                                | 2021 – 2024 |  |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 06       | <b>Tutorial<br/>Hrs./Sem.</b> | 4 | <b>DSE II: MOBILE<br/>COMPUTING</b> | <b>Semester:</b>                             | VI          |  |
|   |          |                               |   |                                     | <b>Credits:</b>                              | 5           |  |

#### Course Objective

1. Understand the various concepts and techniques of WAP, GSM, CDMA, 2G, and 3G.
2. Gain knowledge about different mobile platforms and application development.

#### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Understand various networks, standards, communication medium, Spread spectrum technology              | K1/K2           |
| CO2       | Analyze the basic concepts of wireless networks.  | K2/K3           |
| CO3       | Deploy the mobile applications to the devices.  | K3              |
| CO4       | Demonstrate basic skills for cellular networks design.  | K4/K5           |
| CO5       | Examine to design and develop mobile computing solutions using various components of mobile computing | K5              |

#### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO1<br>0 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | H   | H        | H    | H    |
| CO2              | H   | L   | H   | M   | H   | M   | H   | H   | M   | M        | L    | M    |
| CO3              | H   | M   | H   | M   | H   | M   | H   | H   | M   | M        | H    | M    |
| CO4              | M   | H   | M   | H   | M   | H   | M   | L   | H   | H        | M    | H    |
| CO5              | H   | M   | H   | M   | L   | M   | H   | H   | M   | M        | H    | M    |

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



| Units    | Content   | Hrs       |
|----------|---|-----------|
| Unit I   | Introduction: Mobility of Bits and Bytes – Wireless the Beginning – Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Application and services – Security in mobile computing – Standards – Why is it necessary – Standard bodies. Mobile Computing Architecture: Architecture for mobile computing – Three-tier architecture – Mobile computing through Internet – Making existing applications mobile enabled. | 18        |
| Unit II  | Mobile Computing Through Telephony: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – IVR Application – Voice XML – TAPI. Emerging Technologies: Blue Tooth – RFID – WiMAX – Mobile IP – IPv6 – Java Card.  | 18        |
| Unit III | GSM: Global System for mobile communications – GSM Architecture – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – GSM Frequency allocations – Authentications and Security. SMS: Strengths – Architecture – SM MT – SM MO – VAS through SMS   | 18        |
| Unit IV  | GPRS: GPRS and packet data network – Architecture – Network Operations – Data services – Applications – Limitations – Billing and Charging. WAP: WAE – User agent & UAPProf – WML – WSP – WTP – WDP – Gateway. MMS: Architecture – Transaction Flows  | 18        |
| Unit V   | CDMA and 3G: Spread spectrum technology. IS 95: Speech and Channel Coding – Architecture – Channel Structure. CDMA vs. GSM – Wireless Data. 3G: IMT & CDMA 2000 – Applications on 3G. Wireless LAN: Advantages – IEEE 802.11 standards – Types – 802.11 Architecture – Mobility – Deploying – Mobile Ad Hoc networks and sensor networks – Security – Wi-Fi vs. 3G  | 18        |
|          | <b>Total Contact Hrs</b>  | <b>90</b> |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|

**Text Book**

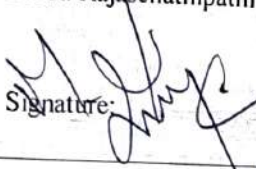

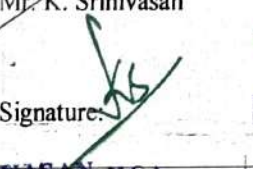

| S.NO | AUTHOR   | TITLE OF THE BOOK  | PUBLISHERS \ EDITION         | YEAR OF PUBLICATION |
|------|--|--|------------------------------|---------------------|
| 1    | Asoke K Talukder,<br>Hasan Ahmed, Roopa<br>R Yavagal | Mobile Computing:<br>Technology,<br>Applications and<br>Service Creation | TMH, 2 <sup>nd</sup> Edition | 2017                |

**Reference Books**

| S.NO | AUTHOR                   | TITLE OF THE BOOK                    | PUBLISHERS \ EDITION                                | YEAR OF PUBLICATION |
|------|--------------------------|--------------------------------------|---|---------------------|
| 1    | Jochen Schiller          | Mobile Communication                 | Pearson Education<br>Asia, 2nd Edition              | 2017                |
| 2    | Christoffer<br>Andersson | GPRS and 3G Wireless<br>Applications | John Wiley and<br>son's                             | 2012                |
| 3    | Raj Kamal                | Mobile Computing                     | Oxford University<br>Press, 3 <sup>rd</sup> Edition | 2019                |

**Web Resources**

|  |
|--|
| 1. <a href="https://nptel.ac.in/courses/106/106/106106147/">https://nptel.ac.in/courses/106/106/106106147/</a>   |
| 2. <a href="https://www.tutorialspoint.com/mobile_computing/index.htm">https://www.tutorialspoint.com/mobile_computing/index.htm</a>   |
| 3. <a href="https://minigranth.in/mobile-computing-tutorial/bluetooth-technology-mobile-computing">https://minigranth.in/mobile-computing-tutorial/bluetooth-technology-mobile-computing</a> |
| 4. <a href="https://www.educba.com/gprs-architecture/">https://www.educba.com/gprs-architecture/</a>   |
| 5. <a href="https://www.javatpoint.com/wireless-lan-introduction">https://www.javatpoint.com/wireless-lan-introduction</a>   |

| Course Designed by   | Verified by HOD  | Checked by   | Approved by  |
|--|--|--|--|
| Name and Signature   | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature:  | Name:<br>Dr. R. Manickachezian<br>Signature:  |

**Dr. M. RAJASENATHIPATHI**  
 Head of the Department  
 Department of Computer Technology  
 Nallamuthu Gounder Mahalingam College (Autonomous)  
 POLLACHI - 642 001

**K. SRINIVASAN, M.C.A.,**  
 Co-ordinator  
 Curriculum Development Cell (CDC)  
 NGM College (Autonomous)  
 Pollachi - 642 001

**Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,**  
 Controller of Examinations  
 NGM College (Autonomous)  
 POLLACHI - 642 001.

|   |          |                               |    |  |  |             |  |
|---|----------|-------------------------------|----|--|--|-------------|--|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |    | <b>Programme Title:</b>                                | Bachelor of Science<br>(Computer Technology) |             |  |
| <b>Course Code:</b>                                     | 21UCT6E2 |                               |    | <b>Title</b>   | <b>Batch:</b>                                | 2021 – 2024 |  |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 06       | <b>Tutorial<br/>Hrs./Sem.</b> | 04 | <b>DSE II:<br/>SOFTWARE<br/>PROJECT<br/>MANAGEMENT</b> | <b>Semester:</b>                             | VI          |  |
|   |          |                               |    |  | <b>Credits:</b>                              | 5           |  |

#### Course Objective

1. To provide the graduates to identify key areas of concern over Project Life Cycle (PLC) and use of project management principles across all the phases of PLC.
2. To understand the importance and necessity of project plan and how it is helpful to project manager in monitoring and controlling the various aspects of the project

#### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Identify the activities of Software Project Management  | K2              |
| CO2       | Select appropriate approach for software project  | K2/K3           |
| CO3       | Manage people in software environment   | K3              |
| CO4       | Create a critical path and a precedence network for a project.  | K4              |
| CO5       | Generate project schedule and can construct, design and develop network diagram for different type of Projects. | K4/K5           |

#### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | L    | H    |
| CO2              | H   | M   | L   | M   | H   | M   | H   | M   | H   | M    | H    | M    |
| CO3              | H   | M   | H   | M   | H   | M   | H   | L   | H   | M    | H    | M    |
| CO4              | M   | H   | M   | H   | M   | H   | M   | H   | M   | H    | M    | H    |
| CO5              | L   | M   | H   | M   | H   | M   | H   | M   | H   | M    | H    | M    |

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

| Units    | Content  | Hrs       |
|----------|--|-----------|
| Unit I   | Introduction to Software Project Management, Why is software project management is important?, What is Project, Software Project vs other types of project, Activities covered by Software Project Management Plans, Methods and Methodologies, Categorizing software Projects, Stakeholder, Setting Objectives, Project success and Failure. What is Management? Management Control, Traditional and modern Project Management Practices. | 18        |
| Unit II  | An overview of Project Planning: Step 0 to 10, Selecting of an Appropriate Project Approach: Choosing methodologies and Technologies, Software Processes and Software Models, The Waterfall Model, The Spiral Model, Software Prototyping, other ways of categorizing prototypes, Incremental Delivery, RAD and Agile Methods: Extreme programming, Scrum.   | 18        |
| Unit III | Software Effort Estimation: Introduction, Where are Estimates Done? Software Effort Estimation Techniques, Bottom up Estimating, The Top Down Approach, Expert Judgement, Function Point Analysis, COCOMO Model, Activity Planning   | 18        |
| Unit IV  | Risk Management: Risk, Categories of Risk, A Framework for Dealing with Risk, Risk Identification, Risk Assessment, Risk Planning, Risk Management, Applying PERT Technique. Resource Allocation.  | 18        |
| Unit V   | Monitoring and Control, Managing People in Software environments.  | 18        |
|          | <b>Total Contact Hrs</b>   | <b>90</b> |

#### Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

#### Assessment Methods

Seminar, Quiz, Assignments, Group Task.

**Text Book**

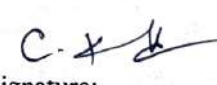
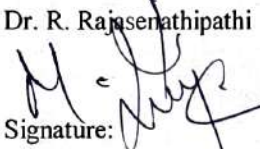
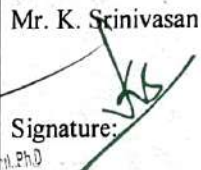

| S.NO | AUTHOR                                 | TITLE OF THE BOOK           | PUBLISHERS \ EDITION                                   | YEAR OF PUBLICATION |
|------|--|-----------------------------|--|---------------------|
| 1    | Bob Hughes, Mike Cotterell, Rajib Mall | Software Project Management | Tata McGraw Hill Publications, 6 <sup>th</sup> Edition | 2017                |

**Reference Books**

| S.NO | AUTHOR                            | TITLE OF THE BOOK   | PUBLISHERS \ EDITION                                   | YEAR OF PUBLICATION |
|------|-----------------------------------|---|--|---------------------|
| 1    | Roger S. Pressman                 | Software Engineering  | Tata McGraw Hill Publications, 8 <sup>th</sup> Edition | 2019                |
| 2    | John M. Nicholas and Herman Steyn | Project Management for Engineering, Business and Technology | Taylor&Francis, 5 <sup>th</sup> Edition                | 2016                |
| 3    | Er. Rishabh Anand                 | Principles of Software Project Management                   | S.K. Kataria & Sons, 1 <sup>st</sup> Edition           | 2014                |
| 4    | Walker Royce                      | Software Project Management-A Unified Framework             | Pearson publication, 1 <sup>st</sup> Edition           | 2015                |

**Web Resources**

|  |
|--|
| 1. <a href="https://nptel.ac.in/courses/106/105/106105218/">https://nptel.ac.in/courses/106/105/106105218/</a>   |
| 2. <a href="https://freevideolectures.com/course/4071/nptel-software-project-management">https://freevideolectures.com/course/4071/nptel-software-project-management</a>   |
| 3. <a href="https://www.nptelvideos.com/video.php?id=918">https://www.nptelvideos.com/video.php?id=918</a>   |
| 4. <a href="https://www.classcentral.com/course/swayam-software-project-management-14294">https://www.classcentral.com/course/swayam-software-project-management-14294</a> |
| 5. <a href="https://www.w3schools.in/sdlc-tutorial/software-development-life-cycle-sdlc">https://www.w3schools.in/sdlc-tutorial/software-development-life-cycle-sdlc</a>   |

| Course Designed by  | Verified by HOD  | Checked by   | Approved by   |
|---|--|--|---|
| Name and Signature  | Name and Signature   | Co-ordinator CDC   | COE   |
| Name:<br>Ms. C. Keerthana<br><br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

**Dr. M. RAJASENATHIPATHI** M.A., M.C.A., M.Phil., Ph.D.  
 Head of the Department  
 Department of Computer Technology  
 Nallamuthu Gounder Mahalingam College (Autonomous)  
 POLLACHI - 642 001.  
**K. SRINIVASAN, M.C.A.**  
 Co-ordinator  
 Curriculum Development Cell (CDC)  
 NGM College (Autonomous)  
 Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN, M.S., Ph.D.**  
 Controller of Examinations  
 Signature:  
 NGM College (Autonomous)  
 POLLACHI - 642 001.

|   |          |                               |    |                           |  |             |
|---|----------|-------------------------------|----|---------------------------|--|-------------|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |    | <b>Programme Title:</b>   | Bachelor of Science<br>(Computer Technology) |             |
| <b>Course Code:</b>                                     | 21UCT6E3 |                               |    | <b>Title</b>              | <b>Batch:</b>                                | 2021 – 2024 |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 06       | <b>Tutorial<br/>Hrs./Sem.</b> | 04 | DSE II: GRID<br>COMPUTING | <b>Semester:</b>                             | VI          |
|   |          |                               |    |                           | <b>Credits:</b>                              | 5           |

### Course Objective

To provide a thorough knowledge about the technology application and tool kits for grid computing

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Understanding the fundamentals of grid computing                           | K1              |
| CO2       | Discussing the basics of grid monitoring.                                  | K2/K3           |
| CO3       | Dissect Grid Computing Systems and Architectures                           | K4              |
| CO4       | Analyze the importance of Grid Computing Standards                         | K4/K5           |
| CO5       | Examine the standards supporting Grid Computing services and Functionality | K5              |

### Mapping

| PO<br>/PSO<br>CO | PO<br>1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO1<br>0 | PSO1 | PSO2 |
|------------------|---------|-----|-----|-----|-----|-----|-----|-----|-----|----------|------|------|
| CO1              | H       | H   | H   | H   | H   | H   | L   | H   | H   | H        | H    | H    |
| CO2              | H       | M   | H   | M   | H   | M   | H   | M   | H   | M        | H    | M    |
| CO3              | H       | M   | H   | L   | H   | M   | H   | M   | H   | M        | H    | M    |
| CO4              | L       | H   | M   | H   | M   | H   | M   | H   | M   | H        | M    | H    |
| CO5              | H       | M   | H   | M   | H   | M   | H   | M   | H   | L        | H    | M    |

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



| Units    | Content   | Hrs       |
|----------|---|-----------|
| Unit I   | Introduction: Grid Computing-Key Issues – Applications – Other Approaches – Grid Computing Standards – Pragmatic Course of Investigation.   | 18        |
| Unit II  | Grid Benefits & Status of Technology: Motivations – History of Computing, Communications and Grid Computing – Grid Computing Prime Time – Suppliers and Vendors –Economic Value – Challenges. | 18        |
| Unit III | Components of Grid Computing Systems and Architectures: Basic Constituent Elements-A Functional View – A Physical View – Service View.  | 18        |
| Unit IV  | Grid Computing Standards-OGSI: Standardization – Architectural Constructs –Practical View – OGSA/OGSI Service Elements and Layered Model – More Detailed View.                                | 18        |
| Unit V   | Standards Supporting Grid Computing-OGSA: Functionality Requirements – OGSA Service Taxonomy – Service Relationships – OGSA Services – Security Considerations.                               | 18        |
|          | <b>Total Contact Hrs</b>  | <b>90</b> |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

**Text Book**

| S.NO | AUTHOR        | TITLE OF THE BOOK                       | PUBLISHERS \ EDITION                            | YEAR OF PUBLICATION |
|------|---------------|---|---|---------------------|
| 1    | Daniel Minoli | A Networking Approach to Grid Computing | John Wiley & Sons, Inc, 1 <sup>st</sup> Edition | 2010                |

## Reference Books

| S.NO | AUTHOR  | TITLE OF THE BOOK   | PUBLISHERS \ EDITION                                 | YEAR OF PUBLICATION |
|------|---|---|--|---------------------|
| 1    | Joseph  | Grid Computing  | Pearson Education India                              | 2014                |
| 2    | Kai Hwang, Geoffrey C. Fox and Jack J. Dongarra | Distributed and Cloud Computing: Clusters, Grids, Clouds and the Future of Internet | Morgan Kaufman Publisher, 1 <sup>st</sup> Edition    | 2012                |
| 3    | Jorge G Barbosa, Ines Dutra                     | Grid Computing: Techniques & Future Prospects                                       | Nova Science Publishers Inc, 1 <sup>st</sup> Edition | 2015                |

## Web Resources

|  |
|--|
| 1. <a href="https://www.slideshare.net/poojadixit19/grid-computing-standards">https://www.slideshare.net/poojadixit19/grid-computing-standards</a> |
| 2. <a href="http://www.es.kent.edu/~farrell/grid06/lectures/grid08.pdf">http://www.es.kent.edu/~farrell/grid06/lectures/grid08.pdf</a>             |
| 3. <a href="https://www.geeksforgEEKS.org/grid-computing/">https://www.geeksforgEEKS.org/grid-computing/</a>                                       |
| 4. <a href="http://www.es.kent.edu/~farrell/grid06/lectures/grid01.pdf">http://www.es.kent.edu/~farrell/grid06/lectures/grid01.pdf</a>             |
| 5. <a href="https://plt.ac.in/pltnotes/uploads/CS6703_11.pdf">https://plt.ac.in/pltnotes/uploads/CS6703_11.pdf</a>                                 |

| Course Designed by  | Verified by HOD  | Checked by   | Approved by  |
|---|--|--|--|
| Name and Signature  | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Ms. C. Keerthana<br>Signature:  | Name:<br>Dr. R. Rajaseenathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature:  | Name:<br>Dr. R. Manickachezian<br>Signature:  |

Dr. R. RAJASEENATHI  
Head of the Department  
Department of Computer Technology  
Sri Lakshmi College (Autonomous)  
POLLACHI - 642 001.

**K. SRINIVASAN, M.A., M.C.A., M.Phil., Ph.D.**  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

Dr. R. MANICKACHEZIAN  
M.A., M.C.A., M.Phil., Ph.D.  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

|   |          |                               |    |  |  |             |
|---|----------|-------------------------------|----|--|--|-------------|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |    | <b>Programme Title:</b>                | Bachelor of Science<br>(Computer Technology) |             |
| <b>Course Code:</b>                                     | 21UCT6E4 |                               |    | <b>Title</b>                           | <b>Batch:</b>                                | 2021 – 2024 |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 06       | <b>Tutorial<br/>Hrs./Sem.</b> | 04 | DSE III:<br>ARTIFICIAL<br>INTELLIGENCE | <b>Semester:</b>                             | VI          |
|   |          |                               |    |  | <b>Credits:</b>                              | 5           |

### Course Objective

To embed a deep knowledge about search techniques, reasoning, game playing, expert systems and prolog.

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Learn about the artificial intelligence problem and the characteristics of the problem space | K1              |
| CO2       | Understand the problem solving using predicates.   | K1/K2           |
| CO3       | Apply the concepts of game playing techniques and Expert system                              | K3              |
| CO4       | Analyze AI problem to be solved using prolog   | K4              |
| CO5       | Evaluate different knowledge representation schemes for AI problems                          | K4 /K5          |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | L   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2              | H   | M   | H   | M   | H   | M   | H   | L   | M   | M    | H    | L    |
| CO3              | H   | M   | H   | M   | L   | M   | H   | H   | M   | M    | H    | M    |
| CO4              | M   | H   | M   | H   | M   | H   | M   | M   | H   | H    | L    | H    |
| CO5              | H   | L   | H   | M   | H   | M   | H   | H   | M   | M    | H    | M    |

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

| Units    | Content  | Hrs       |
|----------|--|-----------|
| Unit I   | Problems and search: AI Techniques-Defining the problem as a State Space Search – Production Systems – Problem Characteristics – Production system Characteristics – Heuristic Search Techniques – Generate and test – Hill Climbing – Best-first Search – Problem Reduction – Constraint Satisfaction – Mean-Ends Analysis. | 18        |
| Unit II  | Knowledge Representation: Representations and Mappings- Approaches to Knowledge Representation – Issues in knowledge representation – Representing simple Facts in Logic – Representing Instance and Isa Relationships- Procedural versus Declarative Knowledge – Logic Programming – Forward versus Backward reasoning.     | 18        |
| Unit III | Semantic Nets: Frames - Conceptual Dependency - Game Playing – Overview– The minimax search procedure – Adding Alpha - Beta cutoffs.   | 18        |
| Unit IV  | Expert System : Definition – Characteristics of Expert System – Architecture & Description of Modules – Backward Chaining – Knowledge Acquisition facility. Knowledge Engineering – Expert System Life Cycles – Expert System Tools.   | 18        |
| Unit V   | Prolog: The Introduction-Converting English to prolog facts and rules – goals – Terminology – Variables - Control structures - Arithmetic operators - Matching in Prolog – Backtracking – cuts – Recursion – Lists - Dynamic Databases - I/O Streams - Some aspects specific to LPA Prolog                                   | 18        |
|          | <b>Total Contact Hrs</b>   | <b>90</b> |

**Pedagogy**

Direct Instruction, Flipped Class, Digital Presentation

**Assessment Methods**

Seminar, Quiz, Assignments, Group Task.

**Text Book**

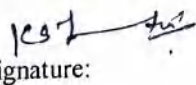
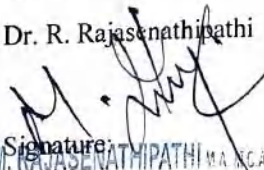
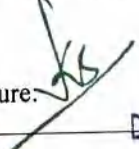
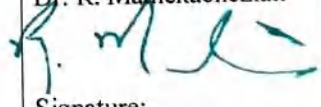
| S.NO | AUTHOR   | TITLE OF THE BOOK       | PUBLISHERS \ EDITION                       | YEAR OF PUBLICATION |
|------|--|-------------------------|--|---------------------|
| 1    | Elaine Rich, Kevin Knight, Shivashankar B Nair | Artificial Intelligence | Tata McGraw Hill , 3 <sup>rd</sup> Edition | 2017                |

## Reference Books

| S.NO | AUTHOR                       | TITLE OF THE BOOK                             | PUBLISHERS \ EDITION                            | YEAR OF PUBLICATION |
|------|------------------------------|---|---|---------------------|
| 1    | Stuart Russell, Peter Norvig | Artificial Intelligence: A Modern Approach    | Pearson Education, 3 <sup>rd</sup> Edition.     | 2015                |
| 2    | Er. Rajiv Chopra             | Artificial Intelligence: A Practical Approach | S. Chand Publications, 1 <sup>st</sup> Edition. | 2016                |

## Web Resources

|  |
|--|
| 1. <a href="https://nptel.ac.in/courses/106/102/106102220/">https://nptel.ac.in/courses/106/102/106102220/</a>   |
| 2. <a href="http://aimaterials.blogspot.com/p/syllabus.html">http://aimaterials.blogspot.com/p/syllabus.html</a>   |
| 3. <a href="https://www.javatpoint.com/expert-systems-in-artificial-intelligence">https://www.javatpoint.com/expert-systems-in-artificial-intelligence</a> |
| 4. <a href="https://www.tutorialspoint.com/prolog/prolog_introduction.htm">https://www.tutorialspoint.com/prolog/prolog_introduction.htm</a>               |
| 5. <a href="https://www.cet.edu.in/noticefiles/271_AI%20Lect%20Notes.pdf">https://www.cet.edu.in/noticefiles/271_AI%20Lect%20Notes.pdf</a>                 |

| Course Designed by  | Verified by HOD  | Checked by   | Approved by   |
|---|--|--|---|
| Name and Signature  | Name and Signature   | Co-ordinator CDC   | COE   |
| Name:<br>Ms. K. S. Leelavathi<br><br>Signature:  | Name:<br>Dr. R. Rajesenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

Dr. M. RAJASENATHIPATHI, M.A., M.Sc., M.Phil., P.H.D.  
Head of the Department  
Department of Computer Technology  
Nallamuthu Gounder Mainlinga College of Engineering  
POLLACHI - 642 001.  
**K. SRINIVASAN, M.C.A.,**  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

|                          |          |                           |    |  |  |             |  |
|--------------------------|----------|---------------------------|----|--|--|-------------|--|
| <b>Programme Code:</b>   | B.Sc. CT |                           |    | <b>Programme Title:</b>                            | Bachelor of Science<br>(Computer Technology) |             |  |
| <b>Course Code:</b>      | 21UCT6E5 |                           |    | <b>Title</b>                                       | <b>Batch:</b>                                | 2021 – 2024 |  |
| <b>Lecture Hrs./Week</b> | 06       | <b>Tutorial Hrs./Sem.</b> | 04 | <b>DSE - III:<br/>UNDERWATER<br/>COMMUNICATION</b> | <b>Semester:</b>                             | VI          |  |
|                          |          |                           |    |  | <b>Credits:</b>                              | 5           |  |

### Course Objective

To study the feasibility and propose solutions to integrate multimedia traffic in the underwater wireless communication network paradigm.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Understand the basic concepts of Underwater Environment                                 | K1/K2           |
| CO2       | To understand the role of Radar, Antennas, Signals in underwater network Communication. | K2/K3           |
| CO3       | To apply different modes of underwater applications                                     | K3              |
| CO4       | To analyze various issues associated with under water communication                     | K4/K5           |
| CO5       | Justify the importance of various Under Water Acoustic Software                         | K5              |

### Mapping

| PO /PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1           | H   | H   | H   | L   | H   | H   | H   | M   | H   | H    | H    | H    |
| CO2           | H   | M   | H   | M   | H   | M   | H   | H   | L   | M    | H    | M    |
| CO3           | H   | M   | H   | M   | H   | M   | H   | H   | H   | M    | H    | M    |
| CO4           | M   | H   | L   | H   | M   | H   | M   | L   | M   | H    | M    | L    |
| CO5           | H   | M   | H   | M   | H   | M   | H   | M   | H   | M    | H    | M    |

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

| Units    | Content  | Hrs       |
|----------|--|-----------|
| Unit I   | Underwater Acoustics: The Development – Exploring the Underwater Environment - Historical Highlights – The pioneers – Civilian developments – The Basic Oceanography – Depth variations. Outline of Underwater Applications: Military applications – Civilian applications.  | 18        |
| Unit II  | Underwater Networking Basics: Underwater Acoustic Infrastructure – Offshore Terrestrial Station - Radar Networks –Data Handling of an Underwater Network – Data Tabulation. Types of Signals – Acoustic Modem – Boosters – Antennas – Receivers – Surface Buoy – Gliders – Yatch/Sailing Boats - Networking of submarines. Underwater electro acoustic transducers –Transducer modeling and design – installation.                                     | 18        |
| Unit III | Underwater Sensor Networks: Ocean Sampling Networks, Pollution Monitoring, Environmental Monitoring and Tactical surveillance systems, Major challenges in design of Underwater Sensor Networks - Factors that affect the UWSN-Sensor Node Architecture GIBS, VRAP, DABS RAPT.<br>Underwater Communication Protocols: Routing Protocols – GPS. Autonomous Underwater Vehicles – Topologies – Servers and Databases - Network Coding – Security issues. | 18        |
| Unit IV  | Water Column Applications: Navigation – Military applications – Fishery Acoustics – Physical Oceanography – Tsunami Applications - Underwater Intervention, Marine Animal Acoustics: Marine mammal bioacoustics Fish bioacoustics – Acoustic Pollution of the Ocean  | 18        |
| Unit V   | Case Study: Under Water Acoustic Software: AcTUP V2.2 L – Underwater Sound Recorder – Sail Tool Software – Sail Imaging Software.  | 18        |
|          | <b>Total Contact Hrs</b>   | <b>90</b> |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|

**Text Book**

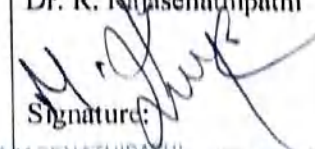
| S.NO | AUTHOR            | TITLE OF THE BOOK  | PUBLISHERS \ EDITION              | YEAR OF PUBLICATION |
|------|-------------------|--|-----------------------------------|---------------------|
| 1    | Lurton and Xavier | An Introduction to Underwater Acoustics: Principles and Applications | Springer, 2 <sup>nd</sup> Edition | 2016                |

**Reference Books**

| S.NO | AUTHOR                               | TITLE OF THE BOOK                                   | PUBLISHERS \ EDITION               | YEAR OF PUBLICATION |
|------|--------------------------------------|---|------------------------------------|---------------------|
| 1    | Yang Xiao                            | Underwater Acoustic Sensor Networks                 | CRC Press, 1 <sup>st</sup> Edition | 2019                |
| 2    | Dimitri Sotnik, Michael Goetz, et al | Cognitive Underwater Acoustic Networking Techniques | Springer, 1st Edition              | 2020                |

**Web Resources**

|  |
|--|
| 1. <a href="https://www.youtube.com/watch?v=FYk1tbTKkYI">https://www.youtube.com/watch?v=FYk1tbTKkYI</a>   |
| 2. <a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5539468/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5539468/</a>                                       |
| 3. <a href="https://www.whoi.edu/science/B/people/kamaral/marinemammalacoustics.html">https://www.whoi.edu/science/B/people/kamaral/marinemammalacoustics.html</a> |
| 4. <a href="https://en.wikipedia.org/wiki/Communication_with_submarines">https://en.wikipedia.org/wiki/Communication_with_submarines</a>                           |
| 5. Curtin University : <a href="http://cmst.curtin.edu.au/products/underwater/">http://cmst.curtin.edu.au/products/underwater/</a>                                 |

| Course Designed by  | Verified by HOD   | Checked by   | Approved by   |
|---|---|--|---|
| Name and Signature  | Name and Signature  | Co-ordinator CDC   | COE   |
| Name:<br>Dr. R. Jayaprakash   | Name:<br>Dr. R. Rajasenathipathi  | Name:<br>Mr. K. Srinivasan   | Name:<br>Dr. R. Manickachezian  |
| Signature:<br> | Signature:<br> | Signature:<br> | Signature:<br> |

Dr. M. RAJASENATHIPATHI, M.A., M.C.A., M.P.S.P., Ph.D.  
Head of the Department  
Department of Computer Technology  
Valluvarthi Govardar College of Engineering  
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.  
Co-ordinator  
Curriculum Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.



### Course Objective

1. To learn and understand the fundamentals of image processing and its relationship between pixels.

|   |          |                               |    |   |  |             |
|---|----------|-------------------------------|----|---|--|-------------|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |    | <b>Programme Title:</b>                 | Bachelor of Science<br>(Computer Technology) |             |
| <b>Course Code:</b>                                     | 21UCT6E6 |                               |    | <b>Title</b>                            | <b>Batch:</b>                                | 2021 – 2024 |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 06       | <b>Tutorial<br/>Hrs./Sem.</b> | 04 | DSE III: DIGITAL<br>IMAGE<br>PROCESSING | <b>Semester:</b>                             | VI          |
|   |          |                               |    |   | <b>Credits:</b>                              | 5           |

2. To understand the key concepts of image compression this estimates the degradation function

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Understand about the fundamentals of digital image processing, Sampling and quantization. | K1/K2           |
| CO2       | Acquire image enhancement, histogram processing and Filtering techniques                  | K2/K3           |
| CO3       | Apply image restoration and transformations, color fundamentals and its models            | K3              |
| CO4       | Analyze the importance of image compression and morphological issues in image processing  | K4              |
| CO5       | Exploring the concepts of Image segmentation  | K5/K6           |

### Mapping

| PO / PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1      | H   | H   | H   | H   | H   | H   | H   | H   | L   | H    | H    | H    |
| CO2      | H   | M   | H   | M   | H   | M   | H   | H   | M   | M    | H    | M    |
| CO3      | H   | L   | H   | M   | H   | M   | H   | H   | M   | M    | L    | M    |
| CO4      | M   | H   | M   | H   | M   | H   | M   | M   | H   | H    | M    | H    |
| CO5      | H   | M   | H   | M   | L   | M   | H   | H   | M   | M    | H    | M    |

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

| Units    | Content  | Hrs       |
|----------|--|-----------|
| Unit I   | <b>Introduction:</b> Digital image processing - Fundamental steps in digital image processing - components of image processing system. Digital Image Fundamentals: A simple image formation model -image sampling and quantization - basic relationships between pixels.   | 18        |
| Unit II  | <b>Image Enhancement in the Spatial Domain:</b> Basic gray-level transformation - histogram processing, enhancement using arithmetic and logic operators - basic spatial filtering - smoothing and sharpening spatial filters - combining the spatial enhancement.   | 18        |
| Unit III | <b>Image Restoration:</b> A model of the image degradation/restoration process - noise models - restoration in the presence of noise-only spatial filtering - Wiener filtering - constrained least squares filtering - geometric transforms; Introduction to the Fourier transform and the frequency domain - estimating the degradation function  | 18        |
| Unit IV  | <b>Color Image Processing:</b> Color fundamentals - color models - pseudo color image processing - basics of full- color image processing - color transforms - smoothing and sharpening - color segmentation. Image Compression: Fundamentals - image compression models - error-free compression -lossy predictive coding - image compression standards                                     | 18        |
| Unit V   | <b>Morphological Image Processing:</b> Preliminaries - dilation, erosion, open and closing, hit or miss transformation, basic morphologic algorithms. Image Segmentation: Detection of discontinuous - edge linking and boundary detection - thresholding - region-based segmentation. Object Recognition: Patterns and patterns classes - recognition based on decision- theoretic methods. | 18        |
|          | <b>Total Contact Hrs</b>   | <b>90</b> |

### Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

### Assessment Methods

Seminar, Quiz, Assignments, Group Task.

## Text Book


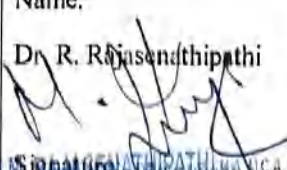
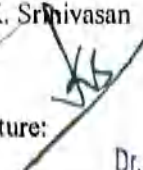
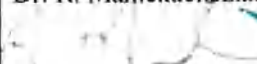
| S.NO | AUTHOR                                  | TITLE OF THE BOOK        | PUBLISHERS \ EDITION                    | YEAR OF PUBLICATION |
|------|---|--------------------------|---|---------------------|
| 1    | Rafeal C. Gonzalez,<br>Richard E. Woods | Digital Image Processing | Pearson<br>Education,<br>Fourth Edition | 2018                |
| 2    | S. Sridhar                              | Digital Image Processing | Oxford<br>University Press              | 2016                |

## Reference Books

| S.NO | AUTHOR  | TITLE OF THE BOOK                         | PUBLISHERS \ EDITION                                | YEAR OF PUBLICATION |
|------|---|---|---|---------------------|
| 1    | Jain  | Fundamentals of Digital Images Processing | Pearson Education<br>India, 1 <sup>st</sup> Edition | 2015                |
| 2    | S. Jayaraman, S.<br>Esakkirajan, T.<br>Veerakumar | Digital Image Processing                  | McGraw Hill, 2 <sup>nd</sup><br>Edition             | 2020                |

## Web Resources

|  |
|--|
| 1. <a href="https://swayam.gov.in/nd1_noc19_ee55/preview">https://swayam.gov.in/nd1_noc19_ee55/preview</a>   |
| 2. <a href="https://nptel.ac.in/courses/117/105/117105079/">https://nptel.ac.in/courses/117/105/117105079/</a>   |
| 3. <a href="https://www.coursera.org/learn/digital">https://www.coursera.org/learn/digital</a>   |
| 4. <a href="https://www.tutorialspoint.com/dip/index.htm">https://www.tutorialspoint.com/dip/index.htm</a>   |
| 5. <a href="https://www.electronicsforu.com/videos-slideshows/digital-image-processing">https://www.electronicsforu.com/videos-slideshows/digital-image-processing</a> |

| Course Designed by   | Verified by HOD  | Checked by   | Approved by   |
|--|--|--|---|
| Name and Signature   | Name and Signature   | Co-ordinator CDC   | COE   |
| Name:<br>Ms. A. Kalaivani  | Name:<br>Dr. R. Rajasenthipathi  | Name:<br>Mr. K. Srinivasan   | Name:<br>Dr. R. Manickachezian  |
| Signature:  | Signature:  | Signature:  | Signature:  |

Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,  
Co-ordinator  
Department of Information Technology  
Nallanchi Campus, Mahalingapuram, Pollachi  
Department of Information Technology  
K. SRINIVASAN, M.C.A.  
Co-ordinator  
Pollachi Development Cell (CDC)  
NGM College (Autonomous)  
Pollachi - 642 001.

Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

|   |          |                               |   |  |  |             |  |
|---|----------|-------------------------------|---|--|--|-------------|--|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |   | <b>Programme Title:</b>  | Bachelor of Science<br>(Computer Technology) |             |  |
| <b>Course Code:</b>                                     | 21UCT622 |                               |   | <b>Title</b>   | <b>Batch:</b>                                | 2021 – 2024 |  |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 05       | <b>Tutorial<br/>Hrs./Sem.</b> | 0 | <b>Core Course Lab -<br/>IX :<br/>FRAMEWORK<br/>TECHNOLOGY</b> | <b>Semester:</b>                             | VI          |  |
|   |          |                               |   |  | <b>Credits:</b>                              | 03          |  |

### Course Objective

The student learn how to design, code, test and debug programs using VB.Net and ADO.Net.

To utilize .NET framework to build distributed enterprise applications.

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | Analyze and apply the VB.NET IDE Framework                           | K3              |
| CO2       | Develop, design and implement VB.Net program using various controls. | K4              |
| CO3       | To validate the concept of files and exception handling mechanism    | K5              |
| CO4       | Implement ADO.Net connectivity                                       | K4              |
| CO5       | Create their own applications with reports.                          | K5              |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | L    | H    |
| CO2              | L   | M   | H   | M   | H   | M   | H   | L   | H   | M    | H    | M    |
| CO3              | H   | M   | H   | M   | H   | M   | H   | M   | H   | M    | H    | L    |
| CO4              | M   | H   | M   | L   | M   | H   | M   | H   | M   | H    | M    | H    |
| CO5              | H   | M   | H   | M   | H   | M   | H   | M   | H   | L    | H    | M    |

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

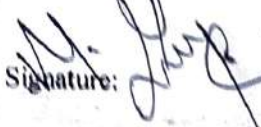



| Units  | Content   | Hrs |
|--------|---|-----|
| Unit 1 | <p><b>Sample Programs</b></p> <p><b><u>VB.NET – Console Application</u></b></p> <ol style="list-style-type: none"> <li>1. Create a Console Application for a simple stack operation in VB.Net</li> <li>2. Create a Console Application for a simple queue operation in VB.Net</li> <li>3. Develop a console application to illustrate the concept of exception handling using VB.Net</li> <li>4. Develop a console application to illustrate the concept of Hash table using VB.Net</li> <li>5. Develop a console application to illustrate the concept of Inheritance</li> <li>6. Develop a console application to illustrate the concept of File handling</li> </ol> <p><b><u>VB.NET – Windows Application</u></b></p> <ol style="list-style-type: none"> <li>1. Develop a Windows Form Application to generate the Bio-Data of a student</li> <li>2. Develop a Windows Form Application to illustrate the concept of Tree-Node Control</li> <li>3. Develop a Windows Form Application to perform the operations of a calculator</li> <li>4. Develop a Windows Form Application to calculate and generate a telephone a bill</li> <li>5. Develop a Windows Forms application to create and generate an E.B. Bill</li> <li>6. Develop a Windows Form application to perform the operations of a Banking System.</li> <li>7. Develop a windows forms application to create a notepad.</li> <li>8. Create a Windows form application to develop a Basic Login form</li> <li>9. Create a Windows Form application to develop an Employee Pay slip</li> <li>10. Create a Windows Form application to develop a Vehicle invoice generation System</li> <li>11. Create a Windows Form application to develop a Library book issue details system.</li> </ol> | 75  |
|        | <b>Total Contact Hrs</b>  | 75  |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|

| Course Designed by   | Verified by HOD  | Checked by   | Approved by   |
|--|--|--|---|
| Name and Signature   | Name and Signature   | Co-ordinator CDC   | COE   |
| Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature:  | Name:<br>Dr. R. Manickachezian<br>Signature:  |

Dr. R. RAJASENATHIPATHI, M.A., M.C.A., M.P.H., Ph.D.  
 Head of the Department  
 Department of Computer Technology  
 Nallamuthu Gounder Mahalingam College (Autonomous)  
 POLLACHI - 642 004.

K. SRINIVASAN, M.C.A.  
 Co-ordinator  
 Curriculum Development Cell  
 NGM College (Autonomous)  
 POLLACHI - 642 004.

Dr. R. MANICKACHEZIAN, M.A., M.C.A., M.P.H., Ph.D.  
 Controller of Examinations  
 NGM College (Autonomous)  
 POLLACHI - 642 004.

Pollachi - 642 004.

|   |          |                               |   |                         |                     |             |
|---|----------|-------------------------------|---|-------------------------|---------------------|-------------|
| <b>Programme Code:</b>                                      | B.Sc.    |                               |   | <b>Programme Title:</b> | Computer Technology |             |
| <b>Course Code:</b>   | 21UCT623 |                               |   | <b>Title</b>            | <b>Batch:</b>       | 2021 – 2024 |
| <b>Lecture Hrs./Week<br/>or<br/>Practical<br/>Hrs./Week</b> | 4        | <b>Tutorial<br/>Hrs./Sem.</b> | 4 | Project                 | <b>Semester:</b>    | VI          |
|   |          |                               |   |                         | <b>Credits:</b>     | 4           |

### Course Objective

1. To understand and select the task based on their core skills.
2. To get the knowledge about analytical skill for solving the selected task.
3. To get confidence for implementing the task and solving the real time problems.
4. Express technical and behavioral ideas and thought in oral settings.
5. Prepare and conduct oral presentations

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | To recollect the programming language concepts to think objectively, analytically, critically in developing industry oriented applications | K3              |
| CO2       | To comprehend about the data base connectivity using front end and back end tools  | K4              |
| CO3       | To validate the application software by various types of testing and its implementation in real environment                                | K5              |
| CO4       | Design engineering solutions to complex problems utilizing a systems approach.   | K4              |
| CO5       | Demonstrate the knowledge, skills and attitudes of a professional engineer.  | K5/K6           |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | H   | H    | H    | H    |
| CO2              | H   | M   | H   | M   | H   | M   | H   | H   | H   | M    | H    | M    |
| CO3              | H   | M   | H   | M   | H   | M   | H   | H   | H   | M    | H    | M    |
| CO4              | M   | H   | M   | H   | M   | H   | M   | H   | H   | H    | M    | H    |
| CO5              | H   | M   | H   | M   | H   | M   | H   | H   | H   | M    | H    | M    |

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

### COMPUTER SCIENCE PROJECT and VIVA VOCE

#### Guidelines

#### **Introduction**

The title of the project work and the organization will be finalized at the end of fifth Semester. Each student will be assigned with a Faculty for guidance. The Project work and coding will be carried by using the facility of computer science lab as well as in the organization. Periodical review will be conducted to monitor the progress of the project work. Project report will be prepared and submitted at the end of the semester. External examiner appointed by the Controller of Examination will conduct the viva voce examination along with respective guide.

#### **Area of Work**

- Web Based Development
- Mobile app development
- Website development
- IoT Projects
- Big Data and Data Mining Projects
- Cloud Computing Projects
- Networking Projects
- Artificial Intelligence and Machine learning Projects
- Data Analytics Projects using Python, R, Tableau etc..
- System Software
- Web Security Projects
- Image Processing



## Methodology

### Arrangement of Contents

The sequence in which the project report material should be arranged and bound as follows:

1. Cover Page & Title Page
2. Bonafide Certificates
3. Declaration
4. Acknowledgement
5. Synopsis
6. Table of Contents
7. Chapters
8. Appendix
9. References

### Format of Table of Contents

#### TABLE OF CONTENTS

| Chapter No. | Title                        | Page No. |
|-------------|------------------------------|----------|
| i           | Certificates                 |          |
| ii          | Declaration                  |          |
| iii         | Acknowledgement              |          |
| iv          | Synopsis                     |          |
| 1.          | <b>Introduction</b>          |          |
|             | 1.1 Introduction             |          |
|             | 1.2 Objective of the Project |          |
|             | 1.3 Company Profile          |          |
|             | 1.4 System Specification     |          |
|             | 1.4.1 Hardware Specification |          |
|             | 1.4.2 Software Specification |          |

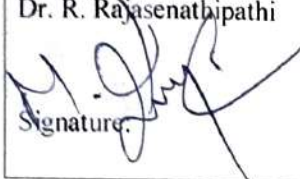
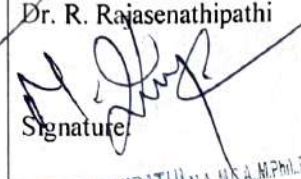
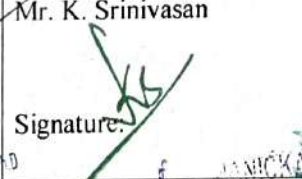
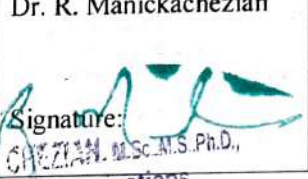
- 2                    **System Study**
- 2.1 Existing System
- 2.1.2 Drawbacks
- 2.2 Proposed System
- 2.3 Planning and Scheduling
- 3                    **System Design**

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

- 3.2 **Overview of the Project**
- 3.1 Modules of the Project
- 3.2 Input Design Format
- 3.3 Output Design
- 3.4 Table Design
- 3.5 Supporting Diagrams (ER/DFD/Use Case)
- 4                    **Implementation and Testing**
- 4.1 Coding Methods
- 4.2 Testing Approach
- 4.3 Implementation and Maintenance
- 5                    **Project Evaluation**
- 5.1 Project Outcome
- 5.2 Limitation of the Project
- 5.3 Further Scope of the Project
- 6                    **Conclusion**
- 7                    **Appendix**
- 7.1 Source Code
- 7.2 Screenshots and Reports
- 8                    **References**

#### Size of the Project

The Project Report contents should be maximum of not exceeding 70 pages.

| Name and Signature  | Name and Signature  | Co-ordinator CDC   | COE   |
|---|---|--|---|
| Name:<br>Dr. R. Rajasenathipathi<br><br>Signature: | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature: | Name:<br>Mr. K. Srinivasan<br><br>Signature: | Name:<br>Dr. R. Manickachezian<br><br>Signature: |

**Dr. M. RAJASENATHIPATHI** M.A., M.S.A., M.Phil., Ph.D.  
 Head of the Department  
 Department of Computer Technology  
 Nallamuthu Gounder Mahalingam College (Autonomous)  
**POLLACHI - 642 001.**

**K. SRINIVASAN, M.C.A.,**  
 Co-ordinator  
 Curriculum Development Cell (CDC)  
 NGM College (Autonomous)  
 Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN** M.Sc., M.S., Ph.D.,  
 Controller of Examinations  
**NGM College (Autonomous)**  
**POLLACHI - 642 001.**

|   |          |                               |    |  |  |             |
|---|----------|-------------------------------|----|--|--|-------------|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |    | <b>Programme Title:</b>  | Bachelor of Science<br>(Computer Technology) |             |
| <b>Course Code:</b>                                     | 21UCT6AL |                               |    | <b>Title</b>   | <b>Batch:</b>                                | 2021 – 2024 |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | SS       | <b>Tutorial<br/>Hrs./Sem.</b> | SS | <b>Advanced Learner<br/>Course - II :<br/>DATA<br/>ANALYTICS</b> | <b>Semester:</b>                             | VI          |
|   |          |                               |    |  | <b>Credits:</b>                              | 04          |

#### — Course Objective

To understand the fundamentals of big data analytics and the methodologies used in storing manipulating and analyze large volumes of unstructured data.

#### Course Outcomes

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

| <b>CO<br/>Number</b> | <b>CO Statement</b>   | <b>Knowledge<br/>Level</b> |
|----------------------|---|----------------------------|
| CO1                  | This course prepares students to gather, describe, and analyze data, and use advanced statistical tools to support decision making  | K2                         |
| CO2                  | To gather sufficient relevant data, conduct data analytics using scientific methods, and understand appropriate connections between quantitative analysis and real world problems | K3                         |
| CO3                  | Understand the exact scopes and possible limitations of each method to provide constructive guidance in decision making.  | K3                         |
| CO4                  | To Use advanced techniques to conduct thorough and insightful analysis, and interpret the results correctly with detailed and useful information.                                 | K4                         |
| CO5                  | To make better decisions by using advanced techniques in data analytics.  | K5                         |

## Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | M   | H    | H    | H    |
| CO2              | H   | M   | H   | L   | H   | H   | H   | M   | L   | M    | H    | M    |
| CO3              | H   | H   | M   | H   | L   | H   | M   | H   | H   | H    | L    | H    |
| CO4              | H   | H   | H   | M   | H   | M   | H   | L   | H   | M    | H    | H    |
| CO5              | H   | H   | H   | H   | M   | H   | L   | H   | H   | H    | H    | M    |

\*H-High, M-Medium, L-Low

| Units                               | Content  | Hrs |
|-------------------------------------|--|-----|
| Unit I                              | Data Definitions and Analysis Techniques: Elements, Variables, and Data Categorization, Levels of Measurement, Data Management and Indexing  | SS  |
| Unit II                             | Descriptive Statistics: Measures of Central Tendency, Measures of Location of Dispersions, Error Estimation and Presentation (Standard Deviation, Variance), Introduction to Probability |     |
| Unit III                            | Basic Analysis Techniques: Statistical Hypothesis Generation and Testing, Chi-Square Test, T-Test, Analysis of Variance, Correlation Analysis, Maximum Likelihood Test                   |     |
| Unit IV                             | Data Analysis Techniques-I: Regression Analysis, Classification Techniques, Clustering Techniques (K-Means, K-Nearest Neighborhood)  |     |
| Unit V                              | Introduction to R Programming: Introduction to R Software Tool, Statistical Computations using R (Mean, Standard Deviation, Variance, Regression, Correlation etc.)                      |     |
| (*SS – Self Study)Total Contact Hrs |  | SS  |

## Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

## Assessment Methods

Seminar, Quiz, Assignments, Group Task.

**Text Book**





| S.NO | AUTHOR   | TITLE OF THE BOOK  | PUBLISHERS \ EDITION                          | YEAR OF PUBLICATION |
|------|--|--|---|---------------------|
| 1    | Ronald E Walppole,<br>Raymond H Myres,<br>Sharon L. Myres<br>and Leying Ye | Probability and statistics for<br>Engineers and Scientists                         | Prentice Hall<br>Inc, 9 <sup>th</sup> Edition | 2012                |
| 2    | Travor Hastie<br>Robert Tibshirani<br>Jerome Friedman                      | The Elements of Statistical<br>Learning, Data Mining,<br>Inference, and Prediction | Springer, 2 <sup>nd</sup><br>Edition          | 2014                |
| 3    | John M. Chambers   | Software for Data Analysis:<br>Programming with R<br>(Statistics and Computing)    | Springer, 2 <sup>nd</sup><br>Edition          | 2016                |

**Reference Books**

| S.NO | AUTHOR                                      | TITLE OF THE BOOK  | PUBLISHERS \ EDITION                                 | YEAR OF PUBLICATION |
|------|---|--|--|---------------------|
| 1    | Radha<br>Shankarmani , M.<br>Vijayalakshmi, | Big Data Analytics   | Wiley, 2 <sup>nd</sup><br>Edition                    | 2016                |
| 2    | Paul Kinley                                 | Data Analytics for Beginners:<br>Basic Guide to Master Data<br>Analytics | CreateSpace<br>Independent<br>Publishing<br>Platform | 2016                |

**Web References**

|    |   |
|----|---|
| 1. | <a href="https://www.javatpoint.com/what-is-big-data">https://www.javatpoint.com/what-is-big-data</a> 2   |
| 2. | <a href="http://www.guru99.com/bigdata-tutorials.html">http://www.guru99.com/bigdata-tutorials.html</a>   |
| 3. | <a href="https://nptel.ac.in/courses/110/106/110106072/">https://nptel.ac.in/courses/110/106/110106072/</a>   |
| 4. | <a href="https://hackr.io/blog/what-is-data-analysis-methods-techniques-tools">https://hackr.io/blog/what-is-data-analysis-methods-techniques-tools</a> |
| 5. | <a href="https://www.tutorialspoint.com/r/index.htm">https://www.tutorialspoint.com/r/index.htm</a>   |

| Course Designed by  | Verified by HOD  | Checked by   | Approved by   |
|---|--|--|---|
| Name and Signature  | Name and Signature   | Co-ordinator CDC   | COE   |
| Name:<br>Ms. C. Keerthana<br><br>Signature:  | Name:<br>Dr. R. Rajesenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature: <br>Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.<br>Controller of Examinations<br>NGM College (Autonomous)<br>POLLACHI - 642 001. |

Dr. M. RAJASENATHIPATHI, MA, M.A., M.PHIL, PND  
Head of the Department  
Department of Computer Technology  
Nallamuthu Gounder Mahalingam College  
Curriculum Development Cell (CDC)  
POLLACHI - NGM College (Autonomous)  
Pollachi - 642 001.

Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.  
Controller of Examinations  
NGM College (Autonomous)  
POLLACHI - 642 001.

|   |          |                               |   |  |  |             |  |
|---|----------|-------------------------------|---|--|--|-------------|--|
| <b>Programme Code:</b>                                  | B.Sc. CT |                               |   | <b>Programme Title:</b>                                  | Bachelor of Science<br>(Computer Technology) |             |  |
| <b>Course Code:</b>                                     | 21UCT6VA |                               |   | <b>Title</b>   | <b>Batch:</b>                                | 2021 – 2024 |  |
| <b>Lecture Hrs./Week<br/>or<br/>Practical Hrs./Week</b> | 02       | <b>Tutorial<br/>Hrs./Sem.</b> | 2 | <b>VAC-II: PC ASSEMBLY<br/>AND CCTV<br/>INSTALLATION</b> | <b>Semester:</b>                             | VI          |  |
|   |          |                               |   |  | <b>Credits:</b>                              | 2           |  |

### Course Objective

This course enables the students to understand the fundamentals of PC Assembly and CCTV Installation

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Understand the basic concepts of Assemble/setup and upgrade personal computer systems | K2              |
| CO2       | Knowledge of CCTV components with modern equipments                                   | K3              |
| CO3       | Identify and Optimize system performance techniques                                   | K3              |
| CO4       | Know about Install and connect peripherals among different devices                    | K4              |
| CO5       | Diagnose and isolate faulty components of the devices                                 | K5              |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1              | H   | H   | H   | H   | H   | H   | H   | H   | L   | H    | H    | H    |
| CO2              | H   | M   | H   | M   | H   | H   | M   | H   | M   | H    | M    | L    |
| CO3              | H   | M   | H   | M   | H   | L   | M   | H   | M   | H    | M    | H    |
| CO4              | M   | H   | L   | H   | M   | M   | H   | M   | H   | M    | H    | M    |
| CO5              | H   | L   | H   | M   | H   | H   | M   | H   | M   | L    | M    | H    |

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



| Units    | Content  | Hrs       |
|----------|--|-----------|
| Unit I   | Computer Components – Computer Tools – Computer Case Preparation - Mother Board - Installing a CPU - Installing a Computer Memory. Installing a Mother Board - Installing a Power Supply - Computer Wiring - Installing a Hard Drive – DVD Drive.              | 10        |
| Unit II  | Installing a Graphics Card – Booting the computer – Install Drivers – Installing Windows 7 and 10 – Trouble Shooting – Case Study.   | 10        |
| Unit III | Electronic Surveillance : Objective : Introduction to Electronic Surveillance - Introducing CCTV - CCTV Technology - Designing of the CCTV System: Objective - Pre-Installation Activities - Customer Requirements and Site Analysis - Selection of Components | 10        |
|          | <b>Total Contact Hrs</b>   | <b>30</b> |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

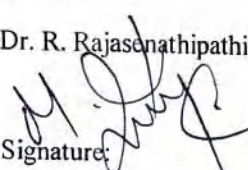
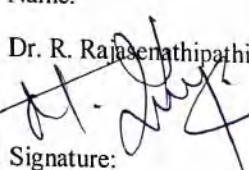
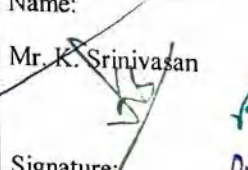
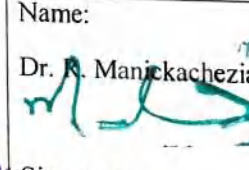
|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|

**Text Book References**

| S.NO | AUTHOR | TITLE OF THE BOOK                 | PUBLISHERS \ EDITION             | YEAR OF PUBLICATION |
|------|--------|-----------------------------------|----------------------------------|---------------------|
| 1    | Prabhu | CCTV Camera Installation Training | 1 <sup>st</sup> ed, CHIP SYSTEMS | 2019                |

## Web References

|  |
|--|
| 1. <a href="https://www.build-your-own-computer.net/support-files/build-your-own-computer.pdf">https://www.build-your-own-computer.net/support-files/build-your-own-computer.pdf</a>                                 |
| 2. CCTV Installation Technician – National Skill Development Corporation – Facilitator Guide   |
| 3. <a href="https://nsdcindia.org/sites/default/files/FG-ELEQ4605-CCTV-Installation-Technician-09-03-2018.pdf">https://nsdcindia.org/sites/default/files/FG-ELEQ4605-CCTV-Installation-Technician-09-03-2018.pdf</a> |
| 4. <a href="https://www.instructables.com/id/How-To-Assemble-A-Basic-Desktop-PC/">https://www.instructables.com/id/How-To-Assemble-A-Basic-Desktop-PC/</a>   |
| 5. <a href="https://choosemy pc.net/assemblyguide/">https://choosemy pc.net/assemblyguide/</a>   |
| 6. <a href="http://ptgmedia.pearsoncmg.com/images/9781587132636/samplechapter/9781587132636_ch03.pdf">http://ptgmedia.pearsoncmg.com/images/9781587132636/samplechapter/9781587132636_ch03.pdf</a>                   |

| Course Designed by   | Verified by HOD  | Checked by   | Approved by  |
|--|--|--|--|
| Name and Signature   | Name and Signature   | Co-ordinator CDC   | COE  |
| Name:<br>Dr. R. Rajasenathipathi<br>Signature:                                  | Name:<br>Dr. R. Rajasenathipathi<br>Signature:  | Name:<br>Mr. K. Srinivasan<br>Signature:  | Name:<br>Dr. R. Manickachezian<br>Signature:  |
| Dr. M. RAJASENATHIPATHI<br>Head of the Department<br>Department of Computer Technology<br>Nallamuthu Counder Mahalingam College (Autonomous)<br>POLLACHI - 642 001 | K. SRINIVASAN, M.C.A.<br>Co-ordinator<br>Curriculum Development Cell (CDC)<br>NGM College (Autonomous)<br>Pollachi - 642 001.      | Dr. R. MANICKACHEZIAN, M.Sc., M.S., Ph.D.<br>Controller of Examinations<br>NGM College (Autonomous)<br>POLLACHI - 642 001.   |  |

|   |          |                          |   |   |                                 |             |
|---|----------|--------------------------|---|---|---------------------------------|-------------|
| <b>Programme Code:</b>                          | B.Sc. CT |                          |   | <b>Programme Title:</b>                                 | Bachelor of Computer Technology |             |
| <b>Course Code:</b>                             | 21UCT6S1 |                          |   | <b>Title</b>  | <b>Batch:</b>                   | 2021 - 2024 |
| <b>Lecture Hrs./Week or Practical Hrs./Week</b> | 2        | <b>Tutorial Hrs./Sem</b> | 0 | SEC – Naan Mudhalvan II – DATA ANALYTICS (BIG DATA) LAB | <b>Semester:</b>                | VI          |
|   |          |                          |   |   | <b>Credits:</b>                 | 02          |

### Course Objective

To educate the basic techniques for extracting information from large datasets such as the web and large document repositories.

### Course Outcomes

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

| CO Number | CO Statement   | Knowledge Level |
|-----------|--|-----------------|
| CO1       | To keep in mind about the data analysis using Excel.   | K3              |
| CO2       | To realize about sorting, cost benefit analysis, calculating mean and standard deviation                         | K4              |
| CO3       | To validate the use of analysis tools to conduct regression and forecasting and calculate descriptive statistics | K5              |
| CO4       | Visualize the data using basic graphs and plots  | K4              |
| CO5       | Dissect the outliers if any in the data set and adapt techniques for handling multi-dimensional data             | K6              |

### Mapping

| PO / PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1            | H   | H   | M   | H   | H   | H   | H   | M   | H   | H    | H    | H    |
| CO2            | H   | H   | H   | H   | H   | H   | H   | H   | L   | H    | H    | M    |
| CO3            | H   | H   | H   | M   | H   | L   | H   | H   | H   | M    | H    | H    |
| CO4            | L   | H   | L   | H   | L   | H   | M   | M   | L   | H    | M    | H    |
| CO5            | H   | H   | H   | H   | M   | H   | H   | H   | H   | M    | H    | L    |

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


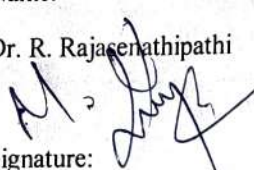


| Units  | Content   | Hrs       |
|--------|---|-----------|
| Unit I | <p><b>Sample Programs</b></p> <ol style="list-style-type: none"> <li>1. Illustrates how to create a basic spreadsheet by entering text, numbers, and formulas.</li> <li>2. Illustrate the formatting of cells and columns.</li> <li>3. Create a spreadsheet to perform "what if?" calculations using Built-in functions.</li> <li>4. Demonstrate the ease of creating charts.</li> <li>5. Sort the data and print portions of a worksheet.</li> <li>6. Illustrates how to dress up a table using special formats and how to export a table or chart into a Microsoft Word document.</li> <li>7. Demonstrate a basic cost-benefit analysis using Excel.</li> <li>8. Consolidate several worksheets into one and to link several worksheets to a master worksheet.</li> <li>9. Illustrate the use of analysis tools for conducting bivariate regression and forecasting.</li> <li>10. Use a worksheet to calculate descriptive statistics (e.g., mean, standard deviation)</li> </ol> | 30        |
|        | <b>Total Contact Hrs</b>  | <b>30</b> |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|

| Course Designed by  | Verified by HOD  | Checked by   | Approved by   |
|---|--|--|---|
| Name and Signature  | Name and Signature   | Co-ordinator CDC   | COE   |
| Name:<br>Ms. K. S. Leelavathi<br><br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

**Dr. M. RAJASENATHIPATHI**, M.A., M.C.A., M.TECH., PH.D.

Head of the Department  
Department of Computer Technology

Nallamuthu Gounder Mahalingam College (Autonomous)  
Pollachi - 642 001

**K. SRINIVASAN**, M.C.A.,  
Co-ordinator

Curriculum Development Cell (CDC)

NGM College (Autonomous)  
Pollachi - 642 001.

**Dr. R. MANICKACHEZIAN**, M.Sc., M.S., Ph.D.

Controller of Examinations

NGM College (Autonomous)

POLLACHI - 642 001.

### Course Objective

|                     |          |                   |   |  |                                 |             |  |
|---------------------|----------|-------------------|---|--|---------------------------------|-------------|--|
| Programme Code:     | B.Sc. CT |                   |   | Programme Title:                                   | Bachelor of Computer Technology |             |  |
| Course Code:        | 21UCT6S2 |                   |   | Title  | Batch:                          | 2021 - 2024 |  |
| Practical Hrs./Week | 2        | Tutorial Hrs./Sem | 0 | SEC – Naan<br>Mudhalvan II –<br>DREAMWEAVER<br>LAB | Semester:                       | VI          |  |
|                     |          |                   |   |  | Credits:                        | 02          |  |

To focus on using Adobe Dreamweaver to create high quality websites.

### Course Outcomes

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

| CO Number | CO Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Identify the basic tools and components of a multimedia project.                                | K2              |
| CO2       | Create a website that adheres to current HTML and CSS   | K3              |
| CO3       | Realize appropriate terminology to describe both web development and basic programming concepts | K4              |
| CO4       | Apply programs by implementing PHP, CSS, JavaScript, JSP, HTML in Dream Weaver                  | K5              |
| CO5       | Design and develop advanced aspects of the Dreamweaver interface and paradigm                   | K6              |

### Mapping

| PO<br>/PSO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
|                  | CO1 | H   | H   | M   | H   | H   | H   | H   | M   | H    | H    | M    |
| CO2              | H   | M   | H   | L   | H   | H   | H   | H   | L   | H    | H    | M    |
| CO3              | H   | H   | H   | M   | H   | L   | H   | H   | H   | M    | H    | M    |
| CO4              | M   | H   | L   | H   | L   | H   | M   | H   | H   | H    | H    | H    |
| CO5              | H   | H   | H   | H   | M   | H   | H   | H   | H   | M    | L    | H    |

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


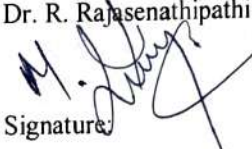
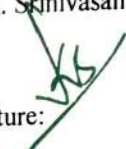

| Units           | Content  | Hrs       |
|-----------------|--|-----------|
| Sample Programs | <p><b>Using Dreamweaver,</b></p> <ol style="list-style-type: none"> <li>1. Create a picture gallery</li> <li>2. Create a template</li> <li>3. Create a CSS text rollover</li> <li>4. Create a Mail-To links</li> <li>5. Create a website</li> <li>6. Create a link to different pages from the same image</li> <li>7. Create List Menus</li> <li>8. Create Submit buttons</li> <li>9. Create Links without an Underline using CSS</li> <li>10. Create a program using CSS</li> <li>11. Working PHP, CSS, JavaScript, JSP, HTML in Dream Weaver.</li> </ol> | 30        |
|                 | <b>Total Contact Hrs</b>   | <b>30</b> |

**Pedagogy**

|   |
|---|
| Direct Instruction, Flipped Class, Digital Presentation |
|---|

**Assessment Methods**

|   |
|---|
| Seminar, Quiz, Assignments, Group Task. |
|---|

| Course Designed by   | Verified by HOD  | Checked by   | Approved by   |
|--|--|--|---|
| Name and Signature   | Name and Signature   | Co-ordinator CDC   | COE   |
| Name:<br>Ms. K. S. Leelavathi<br><br>Signature:  | Name:<br>Dr. R. Rajasenathipathi<br><br>Signature:  | Name:<br>Mr. K. Srinivasan<br><br>Signature:  | Name:<br>Dr. R. Manickachezian<br><br>Signature:  |

Dr. M. RAJASENATHIPATHI, M.A., M.C.A., M.T.S., M.Phil., M.D.  
 Head of the Department  
 Department of Computer Science  
 Nallamuthu Gounder Mahalingam College  
 POLLACHI - 642 001.

K. SRINIVASAN, M.E., M.T.S., M.Phil., M.D.  
 Co-ordinator  
 Curriculum Development Cell (CDC)  
 NGM College (Autonomous)  
 Pollachi - 642 001.

D. P. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,  
 Controller of Examinations  
 NGM College (Autonomous)  
 POLLACHI - 642 001.