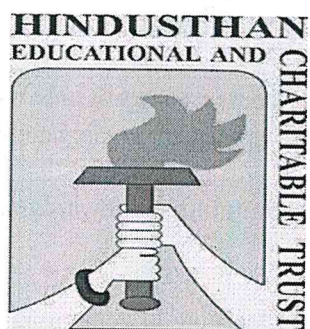


**LEARNING OUTCOMES–BASED CURRICULUM  
FRAMEWORK (LOCF)**

**in the**

**POSTGRADUATE PROGRAMME MASTER OF SCIENCE IN  
INFORMATION TECHNOLOGY**

**FOR THE STUDENTS ADMITTED FROM THE  
ACADEMIC YEAR 2022 - 2023 AND ONWARDS**



**HICAS**

**HINDUSTHAN COLLEGE OF ARTS AND SCIENCE  
(AUTONOMOUS)**

**(Affiliated to Bharathiar University and Accredited by NAAC)**

**COIMBATORE-641028  
TAMILNADU, INDIA.**

Phone: 0422-4440555

Website: [www.hindusthan.net/hicas/](http://www.hindusthan.net/hicas/)

## **PREAMBLE**

The Programme, M.Sc IT with Learning Outcomes-Based Curriculum Framework (LOCF) is to implant technical and theoretical understanding of computers and their numerous applications in diverse sectors in pupils. Students can gain a thorough understanding of academics as well as IT-related applications. The students will learn about the IT scenario, its scope, careers, and the essentials of the IT sector during the curriculum.

## **VISION**

To become a globally recognized Centre of excellence in the field of Information Technology and providing technology excellence that advances learning, teaching, research to produce budding IT professionals, researchers, innovators and entrepreneurs.

## **MISSION**

To provide quality and competency-based education and research activities through necessary infrastructure.

To enable the students to be competitive in the field of Information technology and update the younger generation to congregating the challenges ahead with confidence.

## **PROGRAMME EDUCATIONAL OBJECTIVES (PEO)**

Post Graduates of Information Technology programme will

**PEO1:** Implement domain knowledge of core technologies and deliver professional services in career by incorporating creativity in computing profession.

**PEO2:** Explore leadership skills and incorporate ethics as an entrepreneurship to inculcate problem solving capability, design skills and other diverse career paths.

**PEO3:** Expose Knowledge to various contemporary issues which will enable to become ethical and responsible towards themselves as a co-worker for society and the nation.

**PEO 4:** Graduates will demonstrate commitment towards sustainable development for the betterment of society.

**PEO 5:** Graduates will pursue lifelong learning in generating innovative engineering solutions using research and complex problem-solving skills.

## **PROGRAMME OUTCOME (PO)**

### **FOR LAB ORIENTED SCIENCE COURSES**

**PO1: DISCIPLINARY KNOWLEDGE:** Apply the knowledge of mathematics, science, computer fundamentals, to the solution of complex problems.

**PO2: PROBLEM SOLVING AND ANALYSING:** Identify, formulate, review research literature, and analyze complex real world problems reaching substantiated conclusions using first principles using techniques.

**PO3: ENVIRONMENT SUSTAINABILITY AND ETHICS:** Understand the impact of the professional solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO4: MODERN TOOL USAGE:** Create, select, and apply appropriate techniques, resources and modern IT tools including prediction and modeling to complex technical activities with an understanding of the limitations.

**PO5: CO-OPERATIVE TEAMWORK & COMMUNICATIVE SKILLS:** Communicate effectively on complex activities with the technical community and with society.

**PO6: SELF DIRECTED / LIFELONG LEARNING:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PO7: ENHANCING RESEARCH CULTURE:** Apply ethical research principles and responsibilities of the technical practice.

### **PROGRAMME SPECIFIC OUTCOME (PSO)**

**PSO1:** Provide graduates with a strong foundation in mathematics, science and engineering fundamentals to enable them to devise and deliver efficient solutions to challenging problems in Core and supportive disciplines.

**PSO2:** Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity

**PSO3:** Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems

**PSO4:** Impart analytic and thinking skills to develop initiatives and innovative ideas for R&D, Industry and societal requirements.

**PSO5:** Inculcate qualities of teamwork as well as social, interpersonal and leadership skills and an ability to adapt to evolving professional environments in the domains of engineering and technology.

**HINDUSTHAN COLLEGE OF ARTS & SCIENCE (AUTONOMOUS),**

**COIMBATORE-641028**

**SCHEME OF EXAMINATIONS - CBCS & LOCF PATTERN**

(For the Students admitted from the Academic year 2022-2023 and Onwards)

**PG PROGRAMME**

**Programme: M.Sc**

**Branch: Information Technology**

| Course Code          | Course Type | Course Title   | Credit Points   | Lecture Hours/ Week |           | Exam Duration (hours) | MAX. MARKS |            |            |
|----------------------|-------------|--|---|---------------------|-----------|-----------------------|------------|------------|------------|
|                      |             |  |   | Theory              | Practical |                       | I.E        | E.E        | Total      |
| <b>Semester – I</b>  |             |  |   |                     |           |                       |            |            |            |
| 22ITP01              | DSC         | Web Programming Using Open Source Technologies                                 | 4   | 5                   |           | 3                     | 50         | 50         | 100        |
| 22ITP02              | DSC         | Cloud Computing and Services   | 4   | 4                   |           | 3                     | 50         | 50         | 100        |
| 22ITP03              | DSC         | Advanced Java Programming  | 4   | 5                   |           | 3                     | 50         | 50         | 100        |
| 22ITP04              | DSC         | Database System Concepts   | 4   | 5                   |           | 3                     | 50         | 50         | 100        |
| 22ITP05              | DSC         | <b>Practical I:</b> Web Application Programming                                | 3   | -                   | 5         | 3                     | 50         | 50         | 100        |
| 22ITP06              | DSC         | <b>Practical II:</b> Object-Oriented Programming                               | 3   | -                   | 5         | 3                     | 50         | 50         | 100        |
| 22ITP07              | SEC         | Internship / Institutional Training / <b>Mini-Project</b>                      | 2   | -                   |           |                       | 100        | -          | 100        |
| 22ITPE01             | AEE         | Open Elective – I  | 2   | 3                   |           | 3                     | 100        | -          | 100        |
| 22ITPV01             | ACC         | VAC-I  | 1*  | 2                   |           | 2                     | 50         | -          | 50**       |
| 22ITPJ01             | SEC         | <b>Aptitude / Placement Training</b>   | Grade*  | 2                   |           | 2                     | 50         |            | 50**       |
| -                    | SEC         | SDR – Student Development Record   | <b>Assessment will be done in the end of III – semester</b> |                     |           |                       |            |            |            |
|                      |             | <b>Total</b>   | <b>26</b>   | <b>26</b>           | <b>10</b> |                       | <b>500</b> | <b>300</b> | <b>800</b> |
| <b>Semester – II</b> |             |  |   |                     |           |                       |            |            |            |
| 22ITP08              | DSC         | Advanced Operating System  | 4   | 5                   |           | 3                     | 50         | 50         | 100        |
| 22ITP09              | DSC         | Advanced Networking Technologies   | 4   | 5                   |           | 3                     | 50         | 50         | 100        |
| 22ITP10              | DSC         | Mobile Application Development   | 4   | 5                   |           | 3                     | 50         | 50         | 100        |
| 22ITP11              | DSC         | Software Engineering with Agile and DevOps                                     | 4   | 4                   |           | 3                     | 50         | 50         | 100        |
| 22ITP12              | DSC         | <b>Practical III :</b> Advanced Network Programming                            | 3   | -                   | 5         | 3                     | 50         | 50         | 100        |
| 22ITP13              | DSC         | <b>Practical IV :</b> Mobile Application Programming                           | 3   | -                   | 5         | 3                     | 50         | 50         | 100        |
| 22ITP14              | SEC         | Internship / Institutional Training / <b>Mini-Project / Extension Activity</b> | 2   | -                   |           |                       | 100        | -          | 100        |
| 22ITPE02             | AEE         | Open Elective – II   | 2   | 3                   |           | 3                     | 100        | -          | 100        |
| 22ITPV02             | ACC         | VAC-II   | 1*  | 2                   |           | 2                     | 50         | -          | 50**       |
| 22ITPJ02             | SEC         | <b>Online Courses</b>  | Grade*  | -                   |           |                       | -          | -          | C/NC       |
| 22ITPJ03             | SEC         | <b>Aptitude / Placement Training</b>   | Grade*  | 2                   |           | 2                     | 50         |            | 50**       |
|                      |             | <b>Total</b>   | <b>26</b>   | <b>26</b>           | <b>10</b> |                       | <b>500</b> | <b>300</b> | <b>800</b> |

| Semester - III |     |  |           |           |           |   |            |            |                       |
|----------------|-----|--|-----------|-----------|-----------|---|------------|------------|-----------------------|
| 22ITP15        | DSC | Internet of Things   | 4         | 4         |           | 3 | 50         | 50         | 100                   |
| 22ITP16        | DSC | Deep Learning with Python  | 4         | 5         |           | 3 | 50         | 50         | 100                   |
| 22ITP17        | DSC | Research Methodology   | 4         | 4         |           | 3 | 50         | 50         | 100                   |
| 22ITP18        | DSC | <b>Practical V : Programming the Internet of Things</b>                          | 3         | -         | 5         | 3 | 50         | 50         | 100                   |
| 22ITP19        | DSE | Electives/ <b>DSE-I</b>  | 3         | 3         |           | 3 | 50         | 50         | 100                   |
| 22ITP20        | DSE | Electives/ <b>DSE-II</b>   | 3         | 3         |           | 3 | 50         | 50         | 100                   |
| 22ITP21        | DSC | <b>Practical VI : Deep Learning with Python Programming</b>                      | 3         | -         | 5         | 3 | 50         | 50         | 100                   |
| 22ITP22        | SEC | Internship / Institutional Training/<br><b>Mini-Project / Extension Activity</b> | 2         | -         |           |   | 100        | -          | 100                   |
| 22ITPE03       | AEE | Open Elective-III  | 2         | 3         |           | 3 | 100        | -          | 100                   |
| 22ITPV03       | ACC | VAC-III  | 1*        | 2         |           | 2 | 50         | -          | 50**                  |
| 22ITPJ04       | SEC | <b>Aptitude / Placement Training</b>   | Grade*    | 2         |           | 2 | 50         |            | 50**                  |
| 22ITPJ05       | SEC | <b>Online Courses</b>  | Grade*    | -         |           |   | -          | -          | C/NC                  |
| 22ITPJ06       | SEC | SDR – Student Development Record   | 2*        | -         | -         | - | -          | -          | -                     |
|                |     | <b>Total</b>   | <b>28</b> | <b>26</b> | <b>10</b> |   | <b>550</b> | <b>350</b> | <b>900</b>            |
| Semester – IV  |     |  |           |           |           |   |            |            |                       |
| 22ITP23        | DSE | Electives/ <b>DSE-III</b>  | 3         | 5         |           | 3 | 50         | 50         | 100                   |
| 22ITP24        | DSE | Electives/ <b>DSE-IV</b>   | 3         | 5         |           | 3 | 50         | 50         | 100                   |
| 22ITP25        | DSC | <b>Self-Study Course</b>   | 3         | -         | -         | 3 | 50         | 50         | 100                   |
| 22ITP26        | SEC | <b>Project Work/Student Research</b>   | 5         | -         |           | - | 100        | 100        | 200                   |
|                |     | <b>Total</b>   | <b>14</b> | <b>10</b> |           |   | <b>250</b> | <b>250</b> | <b>500</b>            |
| <b>Total</b>   |     |  | <b>94</b> |           |           |   |            |            | <b>3000 + (300**)</b> |

- \* denotes Extra credits which are not added with total credits.
- \*\* denotes Extra marks which are not added with total marks.
- VAC-Value Added Course (Extra Credit Courses)
- \* Grades depends on the marks obtained

| Range of marks | Equivalent remarks               |
|----------------|----------------------------------|
| 80 and above   | Exemplary                        |
| 70 –79         | Very good                        |
| 60 –69         | Good                             |
| 50 –59         | Satisfactory                     |
| Below 50       | Not Satisfactory = Not completed |

- I.E-Internal Exam
- E.E-External Exam
- J-Job Oriented Course
- E-Open Elective Papers

#### PASSING MINIMUM

- Passing Minimum for PG 50% (Both Internal and External)

## *Abstract for Scheme of Examination*

(For the students admitted during the academic year 2022 - 2023 and onwards)

| Course   | Papers | Credit | Total Credits                     | Marks | Total Marks               |
|--|--------|--------|-----------------------------------|-------|---------------------------|
| Core /DSC  | 11     | 4      | 44                                | 100   | 1100                      |
| Self-Study Course /DSC   | 1      | 3      | 3                                 | 100   | 100                       |
| Electives/DSE  | 4      | 3      | 12                                | 100   | 400                       |
| Practical DSC  | 6      | 3      | 18                                | 100   | 600                       |
| Project SEC  | 1      | 5      | 5                                 | 200   | 200                       |
| Internship/Institutional Training/Mini- Project / Extension Activity | 3      | 2      | 6                                 | 100   | 300                       |
| Open Electives /AEE  | 3      | 2      | 6                                 | 100   | 300                       |
| Job Oriented Course/ Value Added Course                              | 3      | 1*     | 3*                                | 50    | 150**                     |
| Aptitude /Placement Training SEC                                     | 3      | Grade* | Grade*                            | 50    | 150**                     |
| Online Courses / SEC   | 2      | Grade* | Grade*                            | -     | C/NC                      |
| SDR - SEC  | 1      | 2*     | 2*                                | -     | -                         |
| <b>Total</b>   |        |        | <b>94 +<br/>(5 Extra Credits)</b> |       | <b>3000 +<br/>(300**)</b> |

**List of Papers**

|                       |   |
|-----------------------|---|
| <b>Open Electives</b> | Yoga for Human Excellence<br>Human Health & Hygiene Indian<br>Culture and Heritage<br>Indian Constitution and Political System<br>Consumer Awareness and Protection<br>Professional Ethics and Human Values<br>Human Rights, Women's Rights & Gender Equality Disaster<br>Management<br>Green Farming<br>Corporate Relations<br>start a Business?<br>Research Methodology and IPR<br>General Studies for Competitive Examinations IIT JAM<br>Examination (for Science only) CUCET Examination |
| <b>VAC Papers</b>     | a) Digital Marketing<br>b) SAP ERP Fundamentals<br>c) Digital Humanities<br>d) Master Web Designing in Photoshop<br>e) Cyber law<br>f) Web Services   |

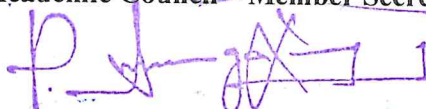
| List of Elective Papers/ DSE<br>(Can choose any one of the paper as electives) |             |  |
|--|-------------|--|
|  | Course Code | Title  |
| Electives/<br>DSE-I  | 22ITP19A    | Elective-I: Enterprise Resource Planning           |
|  | 22ITP19B    | Elective-I: Bioinformatics                         |
| Electives/<br>DSE-II   | 22ITP20A    | Elective-II: Digital Image Processing and Analysis |
|  | 22ITP20B    | Elective-II: Mobile Computing                      |
| Electives/<br>DSE-III  | 22ITP23A    | Elective-III: Soft Computing                       |
|  | 22ITP23B    | Elective-III: Artificial Intelligence              |
| Electives/<br>DSE-IV   | 22ITP24A    | Elective-IV: Multimedia Processing                 |
|  | 22ITP24B    | Elective-IV: Social Networks                       |



Syllabus Coordinator

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**PG Scheme of Evaluation (Internal & External Components)**

(For the students admitted during the academic year 2022-2023 and onwards)

**1. Internal Marks**

| Components                     | Marks     |
|--------------------------------|-----------|
| Test                           | 15        |
| Model Exam                     | 15        |
| Internal Assessment components | 20 #      |
| <b>TOTAL</b>                   | <b>50</b> |

**# List of components for Internal Assessment**

| S.No | Components                             |
|------|--|
| 1    | Multiple choice questions              |
| 2    | Video teach                            |
| 3    | Co-operative or Collaborative Learning |
| 4    | Mini Project/Assignment                |
| 5    | Case study                             |
| 6    | Seminar                                |
| 7    | Role Play                              |
| 8    | Management Games                       |

(Any four components from the above list with five marks each will be calculated .4x5=20 marks)

**2. a) Components for Practical I.E.**

| Components   | Marks     |
|--------------|-----------|
| Test -I      | 15        |
| Test - II    | 15        |
| Observation  | 10        |
| Application* | 10        |
| <b>Total</b> | <b>50</b> |

**b) Components for Practical E.E.**

| Components           | Marks     |
|----------------------|-----------|
| Experiments/Exercise | 40        |
| Record               | 5         |
| Viva                 | 5         |
| <b>Total</b>         | <b>50</b> |

**3. Institutional/ Industrial Training, Mini Project and Major Project Work**

| Internships/Industrial Training (I.E) |            | Mini Project (I.E) | Major Project Work               |       |             |
|---------------------------------------|------------|--------------------|----------------------------------|-------|-------------|
| Component                             | Marks      |                    | Component                        | Marks | Total Marks |
| Work diary                            | 25         | -                  | I.E a)Attendance                 | 20    | 100         |
| Report                                | 50         | 50                 | b)Review                         | 30    |             |
| Viva-voce                             | 25         | 50                 | c) Report                        | 25    |             |
|                                       |            |                    | d)Moc Viva-Voce/<br>Presentation | 25    |             |
| <b>Total</b>                          | <b>100</b> | <b>100</b>         | <b>E.E*</b>                      |       |             |
|                                       |            |                    | a) Final report                  | 60    | 100         |
|                                       |            |                    | b)Viva-voce                      | 40    |             |
|                                       |            |                    | <b>Total</b>                     |       | <b>200</b>  |

\*Evaluation of report and conduct of viva voce will be done jointly by Internal and External Examiners

**4. Value Added Courses and Aptitude/Placement courses:**

| Components   | Marks     |
|--|-----------|
| Two Test (each 1 hour) of 25 marks each<br>QP is objective pattern (25x1=25) | 50        |
| <b>Total</b>   | <b>50</b> |

### 5. Guideline for Open Elective

|  |       |
|--|-------|
| Two tests(each 2 hours) of 50 marks each<br>[5 out of 8 descriptive type questions 5x10=50 Marks | Marks |
|  | 100   |

#### Guidelines:

1. The passing minimum for these items should be 50%
2. If the candidate fails to secure 50% passing minimum, he / she may have to reappear for the same in the Subsequent semesters
3. Item No's:4 is to be treated as 100% Internals and evaluation through online.
4. Item No.2: \* - Application should be from the relevant practical subject other than the listed programmes. It must be enclosed in the practical record.

*For all PG/MBA/MCA Programmes*

*(2022-2023 Regulations)*

**QUESTION PAPER PATTERN FOR CIA EXAM**

Reg.No:-----

Q.P.CODE:

HINDUSTHAN COLLEGE OF ARTS & SCIENCE (AUTONOMOUS)

PG/MBA/MCA DEGREE CIA EXAMINATIONS -----20-----

(-----Semester)

BRANCH: -----

Subject Name: -----

Time: Two Hours

Maximum: 50 Marks

**Section-A (4 x 4=16 Marks)**

Answer ALL Questions

ALL questions carry EQUAL Marks

(Q.No: 1 to 4 Either Or type)

**Section-B (3 x 8=24 Marks)**

Answer any THREE Questions out of FIVE Questions

ALL questions carry EQUAL Marks

(Q.No: 5 to 9)

**Section-C (1 x 10=10 Marks)**

(Compulsory Question: It should be a Case study/Application oriented/Critical analysis from any of the units)

(Q.No: 10)

**QUESTION PAPER PATTERN FOR MODEL / END SEMESTER EXAM**

Reg.No:-----

Q.P.CODE:

HINDUSTHAN COLLEGE OF ARTS & SCIENCE (AUTONOMOUS)

PG/MBA/MCA DEGREE MODEL EXAMINATIONS -----20-----

(-----Semester)

BRANCH: -----

Subject Name: -----

Time: Three Hours

Maximum: 60 Marks

**SECTION – A (5x4=20 marks)**

Answer ALL Questions

ALL Questions carry EQUAL Marks

(Q.No 1 to 5 Either Or type)

(One question from each Unit)

**SECTION – B (3x10=30 Marks)**

Answer any THREE Questions Out of FIVE Questions

ALL Questions carry EQUAL Marks

(Q.No 6 to 10)

(One question from each Unit)

**SECTION – C (1x10=10Marks)**

(Compulsory Question: It should be a Case study/Application oriented/Critical analysis from any of the units)

(Q.No: 11)

## Blue Print of Question Paper for all PG Programmes

(For the academic year 2021-22, 2022-23)

### FOR CIA I - QUESTION PATTERN

Max. Marks:50

| Sec | Question No | Type                    | No of Question | Questions to be answered | Mark per question | K-level   |
|-----|-------------|-------------------------|----------------|--------------------------|-------------------|---|
| A   | 1 to 4      | Either or Type (a or b) | 8              | 4                        | 4<br>(4x4=16)     | 2 Questions will be in K1<br>4 Questions will be in K2<br>2 Questions will be in K3 |
| B   | 5 to 9      | Open choice             | 5              | 3                        | 8<br>(3x8=24)     | 2 Questions will be in K3<br>2 Questions will be in K4<br>1 Questions will be in K5 |
| C   | 10          | Compulsory              | 1              | 1                        | 10<br>(1x10=10)   | 1 Question will be in K5  |

### FOR MODEL/ESE - QUESTION PATTERN

Max. Marks:60

| Sec | Question No | Type                    | No of Questions | Questions to be answered | Mark per question | K-level   |
|-----|-------------|-------------------------|-----------------|--------------------------|-------------------|---|
| A   | 1 to 5      | Either or Type (a or b) | 10              | 5                        | 4<br>(5x4=20)     | 2 Questions will be in K1<br>4 Questions will be in K2<br>4 Questions will be in K3 |
| B   | 6 to 10     | Open choice             | 5               | 3                        | 10<br>(3x10=30)   | 2 Questions will be in K3<br>2 Questions will be in K4<br>1 Questions will be in K5 |
| C   | 11          | Compulsory              | 1               | 1                        | 1<br>(1x10=10)    | 1 Question will be in K5  |

### Distribution of section-wise marks with K levels for PG 2021-22, 2022-23

| CIA - PG                  |          |           |           |           |           |                 |                          |             |
|---------------------------|----------|-----------|-----------|-----------|-----------|-----------------|--------------------------|-------------|
| Sec.                      | K1       | K2        | K3        | K4        | K5        | Total questions | Questions to be answered | Total marks |
| A- Either or type         | 2        | 4         | 2         |           |           | 8               | 4                        | 4X4=16      |
| B - Open choice           |          |           | 2         | 2         | 1         | 5               | 3                        | 3X8=24      |
| C- Compulsory Question    |          |           |           |           | 1         | 1               | 1                        | 1X10=10     |
| <b>Total Marks</b>        | <b>8</b> | <b>16</b> | <b>16</b> | <b>16</b> | <b>18</b> |                 |                          | <b>84</b>   |
| % of marks without choice | 9.52     | 19.05     | 19.05     | 119.05    | 21.43     |                 |                          | 100         |

| Model Exam - PG           |          |           |           |           |           |                 |                          |             |
|---------------------------|----------|-----------|-----------|-----------|-----------|-----------------|--------------------------|-------------|
| Sec.                      | K1       | K2        | K3        | K4        | K5        | Total questions | Questions to be answered | Total marks |
| A- Either or type         | 2        | 4         | 4         |           |           | 10              | 5                        | 5X4=20      |
| B - Either or type        |          |           | 2         | 2         | 1         | 5               | 3                        | 3X10=30     |
| C - Compulsory Question   |          |           |           |           | 1         | 1               | 1                        | 1X10=10     |
| <b>Total Marks</b>        | <b>8</b> | <b>16</b> | <b>36</b> | <b>20</b> | <b>20</b> |                 |                          | <b>100</b>  |
| % of marks without choice | 8        | 16        | 36        | 20        | 20        |                 |                          | 100         |

**PG Programme Regulations for the academic year 2022-2023**

1. Internal marks components for all the candidates admitted from the academic year 2022-2023 and onwards is as follows.

**For Theory courses**

| Components                     | Marks     |
|--------------------------------|-----------|
| Test                           | 15        |
| Model Exam                     | 15        |
| Internal Assessment components | 20        |
| <b>TOTAL</b>                   | <b>50</b> |

**For Practical courses**

| Components           | Marks     |
|----------------------|-----------|
| Test-I               | 15        |
| Test-II              | 15        |
| Observation/Exercise | 10        |
| Application*         | 10        |
| <b>TOTAL</b>         | <b>50</b> |

2. Pattern of question paper for External Examination will be maximum of 60 marks for all theory courses. The marks obtained will be converted into 50 marks as per the scheme.
3. Passing minimum marks for all PG programme is 50 % in internal and 50% in External and the composition of total 50 marks out of 100 marks.
4. Project work is considered as a special course involving application of knowledge in problem solving / analyzing /exploring a real-life situation. A Project work may be given in lieu of a discipline specific elective paper. Distribution of marks for major project work for all PG Programmes will be of 50:50 pattern for both Internal and External in total of 200 marks.
5. Internship / Institutional Training / Mini-Project/ Extension Activity is related to the discipline. The students can be permitted to complete the Internship / Institutional Training / Mini-Project/ Extension Activity before the end of respective semesters (end of I, II and III semester) and submit a report.

|   |  |
|---|--|
| Internship / Institutional Training/ Extension Activity | Not more than seven days                                 |
| Mini project  | During the course of study for not more than seven days. |

6. For fully internal subjects, Two test will be conducted one at the time of CIA I and the other will be during Model Examinations.
7. Retest for the failure candidates in the above case should be conducted immediately before the End Semester Examinations.
8. For the Theory cum Practical blended courses, 50:50 Internal and External pattern will be followed for theory examination and Fully internal pattern will be followed for Practical examination. For theory part, External examination will be conducted as regular pattern (max of 70 marks) and it will be converted into 25 marks.

| Course    | Internal Marks |      | External marks |      | Total marks (Max. marks 50) |      |
|-----------|----------------|------|----------------|------|-----------------------------|------|
|           | Min.           | Max. | Min.           | Max. | Min.                        | Max. |
| Theory    | 12.5           | 25   | 12.5           | 25   | 25                          | 50   |
| Practical | 25             | 50   | -              | -    | 25                          | 50   |

For Practical components for Theory cum Practical courses (Fully Internal)

| Components          | Marks     |
|---------------------|-----------|
| Test I              | 10        |
| Test II             | 10        |
| Experiment/Exercise | 20        |
| Record              | 5         |
| Viva                | 5         |
| <b>Total</b>        | <b>50</b> |

The Internal mark 50 will be converted into 25.

11. For the candidates admitted under the Fast Track System (FTS) must register their names to their concerned department heads and get approval from the COE office at the beginning of the II semester.
12. Self Study will be a Core Paper of the department for which the examination pattern of other theory subjects is followed.
13. Online courses is incorporated as a non-credit skill enhancement course for the III and IV semesters and Grades will be assessed based on the certificates produced by the students. It is compulsory to produce one online course certificate for each semester to avail grades for the students. (2 certificates in any of the online platform is mandatory).
14. SDR – Student Development Report to be received by the department from the students till end of the **Third** semester. (Evidences of Curriculum activities and Co-curriculum activities).
15. Open elective courses:  
Departments can offer list of subjects which teaches moral ethics to the young community for the better future. The topics relevant to Indian ethics, Culture, Women rights, Yoga, Green farming, Indian constitution etc., as an open elective courses. These courses can be offered by the department or other department as inter department courses. Marks earned for this subject will not be included for the CGPA calculation.

## Regulations of Fast Track System (FTS)

- From the academic year 2021-22, our college is offering Fast Track System (FTS) for all UG and PG programmes. In this system, we are offering two courses under the course type of Discipline Specific Elective (DSE) in the sixth semester for all UG programmes and fourth semester for all PG programmes, which are equivalent and related with National Programme on Technology Enhanced Learning/Study Webs of Active-Learning for Young Aspiring Minds (NPTEL/SWAYAM) courses.
- The students have the option of taking two subjects of the sixth semester of their programme through NPTEL/SWAYAM portal from the list given by NPTEL and can complete the online course before fifth semester and submit the received original certificates to the COE office for getting approval. If the student completes these courses before the beginning of the sixth semester (UG)/fourth semester (PG), the candidate can be considered and exempted to write the examination from the assigned DSE courses in the sixth semester/fourth semester. They should complete only the self study course and project work during the VI/IV semester as assigned in the scheme. The candidate who completes the online courses and submits the successful course completion credentials, the credit transfer will be considered as per our Scheme of Examination for qualifying the degree. **The minimum duration of the registered online course must be 12 weeks.** Course duration of less than 12 weeks will not be considered.
- For all PG programmes, the candidates who were admitted during the academic year 2021-2022 under the Fast track system, for the self study course, the internal mark component will be as follows. For others regular internal pattern follows.

| TEST        | Max. Marks   | Mode                  |
|-------------|--------------|-----------------------|
| CIA I       | 50 (50x1=50) | Online objective type |
| Model Exam. | 50 (50x1=50) | Online objective type |

Out of these two tests, the total marks will be converted into 40 marks as Internal.

- For all UG programmes, the candidates who were admitted during the academic year 2021-2022 under the Fast track system, for the self study course, the internal mark component will be as follows. For others regular internal pattern follows.

| TEST        | Max. Marks   | Mode                  |
|-------------|--------------|-----------------------|
| CIA I       | 50 (50x1=50) | Online objective type |
| CIA II      | 50 (50x1=50) | Online objective type |
| Model Exam. | 50 (50x1=50) | Online objective type |

Out of three tests, the total mark will be converted into 30 marks as Internal.

- For the students admitted in Fast Track System, must enroll their names to the concerned department heads and get approval from the COE office at the beginning of III semester for all UG Programmes and at the beginning of II semester for all PG programmes.
- The students who cleared and got certified for online courses under the fast track system, the grade obtained will be converted into average marks of range. The received certificates must be submitted to the COE office for approval of the Controller and the Principal. The FTS courses will be treated as fully external.

| DEPARTMENT OF INFORMATION TECHNOLOGY |             |             |  | CLASS: I M.Sc IT |                      |     |     |       |
|--------------------------------------|-------------|-------------|--|------------------|----------------------|-----|-----|-------|
| Sem                                  | Course Type | Course Code | Course Title                                   | Credits          | Contact Hours / Week | CIA | Ext | Total |
| I                                    | DSC         | 22ITP01     | Web Programming Using Open Source Technologies | 4                | 5                    | 50  | 50  | 100   |

| Nature of Course             |                           |   |
|------------------------------|---------------------------|---|
| Knowledge and Skill Oriented | Employability Oriented    | ✓ |
|                              | Entrepreneurship Oriented | ✓ |
|                              | Skill Development         | ✓ |

| Course Objectives  |   |       |         |
|--|---|-------|---------|
| <ul style="list-style-type: none"> <li>• Apply to get familiar with basics of the Internet Programming.</li> <li>• Acquire knowledge and skills for creation of web site considering both client and server side.</li> <li>• Implement interactive web page(s) using HTML, CSS and JavaScript.</li> <li>• Ability to develop responsive web applications</li> <li>• Explore different web extensions and web services standards</li> </ul> |   |       |         |
| Unit   | Course Contents   | Hours | K Level |
| I  | <b>INTRODUCTION :</b><br>Server-Side Web Scripting - Syntax and Variables-Control and Functions. Passing Information between Pages: GET Arguments - POST Arguments - Formatting Form Variables - PHP Super global Arrays  | 13    | Upto K5 |
| II   | <b>DATA MANIPULATIONS:</b> Strings in PHP. - String Functions-Arrays and Array Functions: Creating Arrays - Retrieving Values - Multidimensional Arrays - Inspecting Arrays - Deleting from Arrays - Iteration. Advanced Array Functions: Transformation of Arrays. Number Handling: Numerical Types - Mathematical Operators - Simple Mathematical Functions - Randomness.   | 13    | Upto K5 |
| III  | <b>SESSION AND COOKIES :</b><br>Regular Expressions: Tokenizing and parsing Functions-Regular Expressions - Perl - Compatible Regular Expressions - Advanced String Functions. Working with the File system: PHP File Permissions - File Reading and Writing Functions - File system and Directory Functions - Network Functions - Date and time Functions - Calendar Conversion Functions. Working with Sessions and Cookies: Sessions work in PHP - Session Functions - Configuration Issues - Cookies - Sending HTTP Headers | 13    | Upto K5 |
| IV   | <b>STRUCTURED QUERY LANGUAGE (SQL):</b><br>Relational Database and SQL-SQL standards-The Workhorses of SQL- Database Design-Privileges and Security. PHP and MySQL:   | 14    | Upto K5 |



|   |  |    |         |
|---|--|----|---------|
|   | Connecting to MySQL - Making MySQL Queries - Fetching Data Sets - Multiple Connections - Error Checking - Creating MySQL Databases with PHP - MySQL Functions.<br><b>STORING OBJECTS IN THE CLOUD</b> : Advanced database techniques using MySQL and SQL Server, blob storage, table storage |    |         |
| V | <b>CONTENT MANAGEMENT SYSTEM :</b><br>What is CMS – Word press - Joomla - Drupal -Magento - Prestashop - Comparison of Content Management System, Open cart, Cscart. Search Engine Optimization - How it Works - How SEO in marketing.   | 12 | Upto K5 |

Note: The Questions should be asked in the ratio of 100% theory

#### Book for Study

1. Steve Suehring Tim Converse and Joyce Park,—**PHP6 and MySQL Bible**", Wiley- India. New Delhi 2009
2. Jim Webber, Savas Parastatidis, Ian Robinson, —**REST in Practice**|| O'Reilly Media; 1 edition, [ISBN: 978-0596805821] 2010.

#### Books for Reference

1. Dacie Cristian, —Pack Pub AJAX and PHP||-2006
2. Scouarnec Yann, Stolz Jeremy Jeremy and Glass Michael, —Beginning PHP5, APACHE, MYSQL Web Development||, Wiley-India. New Delhi,2005 Steven Holzner, —The Complete Referencell , Tata McGraw HillEdition,NewDelhi,2009
3. Raymond, Eric S., —The Cathedral and the Bazaar|| on November 7, 2003
4. Moody, Glyn, —Rebel Codell, Penguin Books, London, England, 2001
5. Wheeler, David, —Why OSS/FS? Look at the Numbers!||November 7, 2003

#### Web Resources

1. <https://www.tutorialspoint.com/php/index.htm>
2. <http://www.tizag.com/phpT/>

**Pedagogy:** Chalk & Talk, Exercise, Assignments & PPTs.

**Rationale for Nature of the Course:** Student would be a professional in Website in Php.

#### Activities to be given

1. Generate an application to simply the process in managing the database.
2. Develop a website to bring out student ideas in business application.
3. Provide a seminar on Domain name server, Web server, database management , cloud services.

### Course Learning Outcomes

| CLOs | On Completion of the Course, the students should be able to                        | K - Level |
|------|--|-----------|
| CLO1 | Creation of interactive webpage(s) using HTML, CSS and JavaScript.                 | Upto K5   |
| CLO2 | Illustrate a responsive website using HTML5 and CSS3.                              | Upto K5   |
| CLO3 | Apply Dynamic website using server side PHP Programming and Database connectivity. | Upto K5   |
| CLO4 | Determine and differentiate different Web Extensions and Web Services.             | Upto K5   |
| CLO5 | Reframe the Content Management Systems   | Upto K5   |

### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

| CLOs  | Programme Outcomes |      |      |      |      |      |      |
|-------|--------------------|------|------|------|------|------|------|
|       | PO 1               | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 |
| CLO 1 | 2                  | 3    | 3    | 3    | 3    | 3    | 3    |
| CLO 2 | 3                  | 2    | 2    | 2    | 3    | 2    | 3    |
| CLO 3 | 2                  | 3    | 3    | 3    | 3    | 2    | 3    |
| CLO 4 | 3                  | 2    | 2    | 3    | 3    | 3    | 2    |
| CLO 5 | 3                  | 3    | 3    | 3    | 3    | 3    | 3    |

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

| Course Designed by    | Verified by HOD  | Approved by CDCCo-coordinator |
|-----------------------|------------------|-------------------------------|
| Mr. K.S. Senthilkumar | Dr. V. Saravanan |                               |

Co-ordinator  
Curriculum Development Cell  
Hindusthan College of Arts & Science,  
Coimbatore-641 028.

| DEPARTMENT OF INFORMATIONTECHNOLOGY |             |             |                              | CLASS: I M.Sc IT |                      |     |     |       |
|-------------------------------------|-------------|-------------|------------------------------|------------------|----------------------|-----|-----|-------|
| Sem                                 | Course Type | Course Code | Course Title                 | Credits          | Contact Hours / Week | CIA | Ext | Total |
| I                                   | DSC         | 22ITP02     | Cloud Computing and Services | 4                | 4                    | 50  | 50  | 100   |

| Nature of Course             |                           |   |
|------------------------------|---------------------------|---|
| Knowledge and Skill Oriented | Employability Oriented    | ✓ |
|                              | Entrepreneurship Oriented | ✓ |
|                              | Skill Development         | ✓ |

| Course Objectives  |  |       |         |
|--|--|-------|---------|
| <ul style="list-style-type: none"> <li>• Implementing the Basics of Cloud computing and its key concepts.</li> <li>• Remembering and applying the cloud computing services.</li> <li>• Able to do Cloud implementation and Mobile cloud computing.</li> <li>• To gain Knowledge in Key components of Amazon Web Services.</li> <li>• Providing sufficient foundations to enable further study and research.</li> </ul> |  |       |         |
| Unit   | Course Contents  | Hours | K Level |
| I  | <b>Defining Cloud Computing:</b> Definition - Cloud types - Benefits of cloud computing – Disadvantages – Role of Open standards - Understanding Cloud Architecture: Exploring the cloud computing stack.  | 10    | Upto K5 |
| II   | <b>Understanding Services and Applications by type:</b> Defining IaaS, PaaS, SaaS – Defining Identity as a Service IDaaS – Defining Compliance as a Service (CaaS) - Understanding Abstraction and Virtualization – Capacity Planning.   | 10    | Upto K5 |
| III  | <b>Exploring Platform as a Service:</b> Defining Services – Using PaaS Application Frameworks – Using Google web services: Exploring Google Applications, Surveying the Google Application portfolio- Using Amazon Web Services - Using Microsoft Cloud Services: Exploring Microsoft Cloud Services, Defining the Windows Azure Platform. | 12    | Upto K5 |
| IV   | <b>Exploring Cloud Infrastructures:</b> Administrating the cloud – Understanding Cloud Security: Securing the cloud - Securing data - Establishing Identity and presence – Introducing Service Oriented Architecture – Defining SOA Communication – Managing and monitoring SOA.   | 10    | Upto K5 |
| V  | <b>Working with Cloud based storage:</b> Cloud storage definition – Provisioning Cloud storage – Exploring cloud backup solutions – Using Webmail services: Exploring Cloud mail Services – Exploring Instant messaging – Collaboration Technologies – Using Media and Streaming.  | 10    | Upto K5 |

Note: The Questions should be asked in the ratio of 100% theory

**Book for Study**

1. Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010

**Books for Reference**

1. Tim Mather, Subra Kumaraswamy, and Shahed Latif, Cloud Security and Privacy An Enterprise Perspective on Risks and Compliance, O'Reilly 2009
2. Cloud Computing – Second Edition by Dr. Kumar Saurabh, Wiley India
3. Jason Venner, —Pro Hadoop- Build Scalable, Distributed Applications in the Cloud, A Press, 2009.
4. Architecting the Cloud: Design Decisions for Cloud Computing Service Models(SaaS, PaaS, and IaaS) (Wiley CIO) by Michael J. Kavis(Author), 2014
5. Data and Computer Communications, W. Stallings, Prentice Hall of India, 2013.

**Web Resources**

1. <https://lecturenotes.in/notes/14455-note-for-cloud-computing-cc-by-rayipudiedukondalu?reading=true&continue=2>
2. <http://www.tizag.com/phpT/>

**Pedagogy:** Chalk & Talk, Exercise, Assignments & PPTs.

**Rationale for Nature of the Course :** Student can create and store the data in private cloud

**Activities to be given**

1. Work and Learn the Basics of Cloud Services.
2. Work with GCloud or Amazon Azure to learn the storage concepts
3. Provide a seminar on Cloud Infrastructures, Services

**Course Learning Outcomes**

| CLOs | On Completion of the Course, the students should be able to                                  | K - Level |
|------|--|-----------|
| CLO1 | Illustrate Cloud Computing and categories the different Cloud services and deployment models | Upto K5   |
| CLO2 | Accessing the key components of Amazon web Service   | Upto K5   |
| CLO3 | Compare security and privacy issues in cloud computing.                                      | Upto K5   |
| CLO4 | Analyze the components of open stack & Google Cloud platform and Mobile Cloud Computing      | Upto K5   |
| CLO5 | Applying the cloud concepts in real time   | Upto K5   |


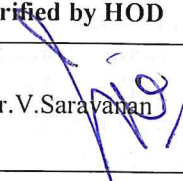
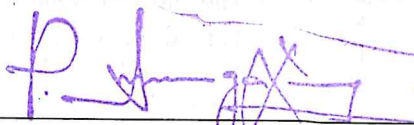
**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

| CLOs  | Programme Outcomes |      |      |      |      |      |      |
|-------|--------------------|------|------|------|------|------|------|
|       | PO 1               | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 |
| CLO 1 | 2                  | 3    | 3    | 3    | 3    | 3    | 3    |
| CLO 2 | 3                  | 2    | 2    | 2    | 3    | 2    | 3    |
| CLO 3 | 2                  | 3    | 3    | 3    | 3    | 2    | 3    |
| CLO 4 | 3                  | 2    | 2    | 3    | 3    | 3    | 2    |
| CLO 5 | 3                  | 3    | 3    | 3    | 3    | 3    | 3    |

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

| Course Designed by   | Verified by HOD   | Approved by CDC Co-coordinator  |
|--|---|---|
| <br>Ms. G. Siva Brindha | <br>Dr. V. Saravanan |  |

Co-ordinator  
 Curriculum Development Cell  
 Hindusthan College of Arts & Science,  
 Coimbatore-641 028.

| DEPARTMENT OF INFORMATION TECHNOLOGY |             |             |                           | CLASS: I M.Sc IT |                      |     |     |       |
|--------------------------------------|-------------|-------------|---------------------------|------------------|----------------------|-----|-----|-------|
| Sem                                  | Course Type | Course Code | Course Title              | Credits          | Contact Hours / Week | CIA | Ext | Total |
| I                                    | DSC         | 22ITP03     | Advanced Java Programming | 4                | 5                    | 50  | 50  | 100   |

| Nature of Course             |                           |   |
|------------------------------|---------------------------|---|
| Knowledge and Skill Oriented | Employability Oriented    | ✓ |
|                              | Entrepreneurship Oriented | ✓ |
|                              | Skill Development         | ✓ |

| Course Objectives  |   |       |         |
|--|---|-------|---------|
| <ul style="list-style-type: none"> <li>• Applying the Advanced concepts of Applets and JDBC</li> <li>• Demonstrate the use of good object-oriented design principles including encapsulation and information hiding.</li> <li>• Demonstrating the variety of basic control structures including selection and repetition</li> <li>• Create to learn Framework Technologies like spring, Struts, Hibernate.</li> <li>• Create RMI application with Framework</li> </ul> |   |       |         |
| Unit   | Course Contents   | Hours | K Level |
| I  | <b>Overview: Object Oriented Programming</b> -Simple Program-control statements. Introducing Classes – class fundamentals - Declaring objects – assigning object reference-Variables- introducing methods - constructors. The Java Thread Model - Main Thread- creating a Thread - Creating Multiple Threads - using is Alive () and join () - Thread Priorities - Synchronization – Inter thread communication - Suspending ,resuming and stopping Threads | 13    | Upto K5 |
| II   | <b>Applet Fundamentals</b> - Applet Class - Applet lifecycle-Steps for Developing Applet Programs- Passing Values through Parameters-Graphics in Applets- GUI Application - Dialog Boxes – Creating Windows - Layout Managers – AWT Component classes – Swing component classes- Borders – Event handling with AWT components -AWT Graphics classes - File Choosers – Color Choosers – Tree – Table–Tabbed panels–Progressive bar - Sliders.                | 13    | Upto K5 |
| III  | <b>JDBC</b> -Introduction - JDBC Architecture - JDBC Classes and Interfaces Database Access with MySQL -Steps in Developing JDBC application - Creating a New Database and Table with JDBC -Working with Database Metadata;   | 13    | Upto K5 |

|    |   |    |         |
|----|---|----|---------|
|    | Java Networking Basics of Networking - Networking in Java- Socket Program using TCP/IP -Socket Program using UDP- URL and Inet address classes.   |    |         |
| IV | <b>Structs:</b> Introduction to Structs : What is Structs - Features –Model1 vs Model2 -Custom Validation – Bundled Validators – Ajax Validation View– Controller MVC Design Pattern – tags – UI Components.<br><b>Hibernate:</b> Introduction to Hibernate Framework – ORM Tool- Architecture- Hibernate using XML – Web application | 13 | Upto K5 |
| V  | <b>Spring:</b> Introduction to Spring Framework – Framework of Swing Advantages of Spring Framework - Modules – Application –IoC Container Dependency Injection - Constructor Injection. Web Services – SOAP Web Service – Restful Web services   | 13 | Upto K5 |

Note: The Questions should be asked in the ratio of 100% theory

#### Book for Study

1. Herbert Schildt --The complete Reference Java", TataMcGrawHill, 8th edition, 2011.

#### Books for Reference

1. Deitel&Deitel, "Java How to Program", Prentice Hall, 5th Edition, 2002.
2. "The Complete Reference 2nd Edition James Holmes | TataMcGrawHill 2nd Edition 2007.
3. Black Book — Java server programming | J2EE, 1st ed., Dream Tech Publishers, 2008. 3. Kathy walrath |
4. Java: The Complete Reference, 10<sup>th</sup> Edition 2018, Herbert Schildt, McGraw-Hill
5. Advanced Java Programming, Uttam K. Roy, Oxford University Press, , 9<sup>th</sup> Edition 2015

#### Web Resources

1. <https://beginnersbook.com/java-tutorial-for-beginners-with-examples/>
2. <https://enos.itcollege.ee/~jpoial/allalaadimised/reading/Advanced-java.pdf>

**Pedagogy:** Chalk & Talk, Exercise, Assignments & PPTs.

**Rationale for Nature of the Course :** Students become a Java developer

#### Activities to be given

1. Rich API development in java
2. OOps implementation in developing a desktop application
3. Comparative study on python and java

### Course Learning Outcomes

| CLOs | On Completion of the Course, the students should be able to   | K - Level  |
|------|---|------------|
| CLO1 | Accessing the classes, objects, members of a class and relationships among the needed for a specific problem. | Upto<br>K5 |
| CLO2 | Classify and apply dynamic webpages using Servlets and JSP.   | Upto<br>K5 |
| CLO3 | Apply to develop RMI application using Java Spring Framework  | Upto<br>K5 |
| CLO4 | Analyze and classify the type of framework and its advantages   | Upto<br>K5 |
| CLO5 | Asses Java SDK environment to create debug and run simple Java program  | Upto<br>K5 |


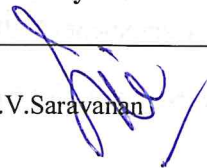
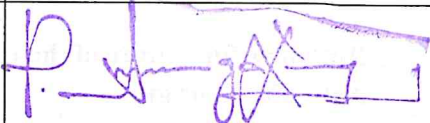
### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

| CLOs  | Programme Outcomes |      |      |      |      |      |      |
|-------|--------------------|------|------|------|------|------|------|
|       | PO 1               | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 |
| CLO 1 | 3                  | 3    | 3    | 3    | 3    | 3    | 3    |
| CLO 2 | 3                  | 3    | 2    | 3    | 2    | 3    | 3    |
| CLO 3 | 2                  | 3    | 3    | 3    | 3    | 2    | 2    |
| CLO 4 | 2                  | 3    | 3    | 3    | 3    | 3    | 2    |
| CLO 5 | 3                  | 2    | 2    | 3    | 3    | 3    | 3    |

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

| Course Designed by   | Verified by HOD   | Approved by CDC<br>Co-coordinator  |
|--|---|--|
| <br>Dr.S.Sasikala | <br>Dr. V. Saravanan |  |

Co-ordinator  
Curriculum Development Cell  
Hindusthan College of Arts & Science  
Coimbatore-641 028.



| DEPARTMENT OF INFORMATION TECHNOLOGY |             |             |                          | CLASS: I M.Sc IT |                      |     |     |       |
|--------------------------------------|-------------|-------------|--------------------------|------------------|----------------------|-----|-----|-------|
| Sem                                  | Course Type | Course Code | Course Title             | Credits          | Contact Hours / Week | CIA | Ext | Total |
| I                                    | DSC         | 22ITP04     | Database System Concepts | 4                | 5                    | 50  | 50  | 100   |

| Nature of Course             |                           |   |
|------------------------------|---------------------------|---|
| Knowledge and Skill Oriented | Employability Oriented    | ✓ |
|                              | Entrepreneurship Oriented |   |
|                              | Skill Development         | ✓ |

### Course Objectives

- Applying DBMS and RDBMS in real time scenario
- Create a relational database using a relational database package.
- Design to facilitating the student to implement the various functionalities of OODBMS.
- Analyze the operations related to creating, manipulating and maintaining databases for Real-world applications using XML
- Designing various storages by querying and managing databases via NOSQL

| Unit | Course Contents  | Hours | K Level |
|------|--|-------|---------|
| I    | <b>Database internals and Advanced concepts:</b><br>Introduction- Data Models - Entity Relationship model<br>Relational model – Relational Database - Introduction - SQL<br>Other Relational languages - Integrity and Security – Relational Database design.  | 11    | Upto K5 |
| II   | <b>Transaction Management:</b><br>Overview of Transaction Management- The ACID properties – Transactions and Schedules – Concurrent execution of Transactions – Lock based concurrency control – Performance of locking - Transaction support in SQL – Introduction to crash recovery – The log – Other recovery related structures – Check pointing – Recovering from a system crash – Media Recovery.  | 13    | Upto K5 |
| III  | <b>Object based Databases and XML:</b><br>Structured Data Types - Operations on Structured Data - Encapsulation and ADTs – Inheritance - Objects, OIDs, and Reference Types - Database Design for an ORDBMS – ORDBMS Implementation Challenges – OODBMS - Comparing RDBMS, OODBMS, and ORDBMS – XML – Background – Structure of XML Data – XML Document Schema – Querying and Transformation - The Application program interface – Storage of XML data- XML Application - Case Study in XML. | 15    | Upto K5 |
| IV   | <b>Parallel and Distributed Databases:</b><br>Distributed Databases – Homogeneous and Heterogeneous Databases -  |       | Upto K5 |

|   |  |    |         |
|---|--|----|---------|
|   | Distributed Data Storage - Distributed Transactions - Commi Protocols- Concurrency Control in Distributed Databases – Availability - Distributed Query Processing - Heterogeneous Distributed Databases - Directory Systems - Parallel Databases – Introduction - I/O Parallelism<br>– Inter query Parallelism – Intra operation Parallelism - Interoperation Parallelism - Design of Parallel Systems – Case Study in Oracle. | 14 |         |
| V | <b>NoSQL:</b><br>NoSQL Basics - Interfacing and Interacting with NoSQL – Storage Architecture – CRUD Operations - NoSQL Stores Queries - Data Stores Modifications and Evolution Management - Indexing and Ordering Data Sets - NoSQL in Cloud – Case Study in MongoDB.  | 12 | Upto K5 |

Note: The Questions should be asked in the ratio of 100% theory

### Book for Study

1. Silberschatz, Korth, Sudarshan, —Database system concepts, 6th Edition, Tata McGraw Hill, 2013 (For UNITS I,III, IV).

### Books for Reference

1. ShashankTiwari, —Professional NoSQL, 1 edition- 2011 (For UNIT V).
2. Open Source Database Management Systems: RDBMS (Open Source DBMS Book 1) By USinhuja and G S Geethamani | 7 August 2021,Kindle Edition.
3. Ramakrishnan, Gehrke, —Database Management Systems, Tata McGraw Hill
4. RamezElmasri and Shamkant B. Navathe, —Fundamentals of Database Systems, Fifth Edition, Pearson Education, 2008.
5. G.K.Gupta, —Database Management Systems, Tata McGraw Hill, 2011.

### Web Resources

1. <https://pdfs.semanticscholar.org/0390/91a2f0772060b60d97df25c59f1000e20aed.pdf>

**Pedagogy:** Chalk & Talk, Exercise, Assignments & PPTs.

**Rationale for Nature of the Course:** Students can create the private database.

### Activities to be given

1. Create a simple database
2. OOPS implementation in developing a DBMS application
3. Access and Manage the database with Open Sources

### Course Learning Outcomes

| CLOs | On Completion of the Course, the students should be able to                         | K - Level  |
|------|---|------------|
| CLO1 | Evaluating the Database internals and Advanced concepts                             | Upto<br>K5 |
| CLO2 | Analyzing the structure of the databases  | Upto<br>K5 |
| CLO3 | Applying the NOSQL concept in real time   | Upto<br>K5 |
| CLO4 | Examine the storage size of the database and design appropriate storage techniques. | Upto<br>K5 |
| CLO5 | Creating the data storage via XML commands  | Upto<br>K5 |

### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

| CLOs  | Programme Outcomes |      |      |      |    |      |      |
|-------|--------------------|------|------|------|----|------|------|
|       | PO 1               | PO 2 | PO 3 | PO 4 | PO | PO 6 | PO 7 |
| CLO 1 | 2                  | 3    | 3    | 3    | 3  | 3    | 2    |
| CLO 2 | 2                  | 2    | 3    | 2    | 3  | 3    | 3    |
| CLO 3 | 3                  | 3    | 3    | 2    | 3  | 2    | 3    |
| CLO 4 | 3                  | 2    | 3    | 3    | 2  | 3    | 2    |
| CLO 5 | 3                  | 3    | 3    | 2    | 3  | 2    | 3    |

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

| Course Designed by | Verified by HOD | Approved by CDC<br>Co-coordinator |
|--------------------|-----------------|-----------------------------------|
| Mrs.S.ARULMOZHI    | DR.V.SARAVANAN  |                                   |

Co-ordinator  
Curriculum Development Cell  
Hindusthan College of Arts & Science,  
Coimbatore-641 028.

| DEPARTMENT OF INFORMATION TECHNOLOGY |             |             |  | CLASS: I M.Sc IT |                      |     |     |       |
|--------------------------------------|-------------|-------------|--|------------------|----------------------|-----|-----|-------|
| Sem                                  | Course Type | Course Code | Course Title                                       | Credits          | Contact Hours / Week | CIA | Ext | Total |
| I                                    | DSC         | 22ITP05     | <b>Practical I:</b><br>Web Application Programming | 3                | 5                    | 50  | 50  | 100   |

| Nature of Course             |                           |   |
|------------------------------|---------------------------|---|
| Knowledge and Skill Oriented | Employability Oriented    | ✓ |
|                              | Entrepreneurship Oriented | ✓ |
|                              | Skill Development         | ✓ |

#### Course Objectives

- Ability to create markup languages and Scripting languages
- Deploying a simple web application using PHP & MySQL
- Knowledge on Creating a Simple Forum based application
- Design Develop Debug and Deploy an application with Admin Panel
- Applying knowledge on Word press.

| Ex.No | PROGRAM LIST  | Hours | K-Level |
|-------|---|-------|---------|
| 1.    | Design and create a program for implementing Inheritance.                       | 6     | Upto K5 |
| 2.    | Develop a program to send an HTML formatted Email with attachment in PHP.       | 7     | Upto K5 |
| 3.    | Develop and demonstrate a program for login authentication using PHP and MySQL. | 6     | Upto K5 |
| 4.    | Creating Crud Grid For A Student Database Using PHP and MySQL.                  | 7     | Upto K5 |
| 5.    | Develop a program to upload a file in PHP.                                      | 6     | Upto K5 |
| 6.    | Design and create a RSS feed using PHP and MySQL.                               | 6     | Upto K5 |
| 7.    | Create a Pay-slip for an employee using PHP and MySQL.                          | 6     | Upto K5 |
| 8.    | Create a simple Discussion board for students to share their knowledge          | 7     | Upto K5 |
| 9.    | Build a college website using Word-press Theme.                                 | 7     | Upto K5 |
| 10.   | Create a home page and customize the data through Admin Panel                   | 7     | Upto K5 |

Note: The Questions should be asked in the ratio of 100% programs

**Pedagogy** :Chalk & Talk, Exercise, Assignments & PPTs.

**Rationale for Nature of the Course :** The course helps to develop a websites using open source technologies

**Course Learning Outcomes**

| CLOs | On Completion of the Course, the students should be able to            | K - Level  |
|------|--|------------|
| CLO1 | List out and develop simple GUI Applications                           | Upto<br>K5 |
| CLO2 | Demonstrate a web application using PHP &MYSQL                         | Upto<br>K5 |
| CLO3 | Applying Template in Web Application                                   | Upto<br>K5 |
| CLO4 | Correlate an application using Client/Server Panel in Web Environment. | Upto<br>K5 |
| CLO5 | Asses design dynamic websites that meet specified needs and interests. | Upto<br>K5 |

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

| CLOs  | Programme Outcomes |      |      |      |      |      |      |
|-------|--------------------|------|------|------|------|------|------|
|       | PO 1               | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 |
| CLO 1 | 3                  | 3    | 2    | 3    | 3    | 3    | 3    |
| CLO 2 | 2                  | 2    | 2    | 3    | 3    | 3    | 3    |
| CLO 3 | 3                  | 3    | 3    | 2    | 3    | 2    | 3    |
| CLO 4 | 3                  | 2    | 2    | 3    | 3    | 3    | 2    |
| CLO 5 | 3                  | 2    | 3    | 3    | 2    | 2    | 3    |

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

| Course Designed by   | Verified by HOD | Approved by CDC<br>Co-coordinator |
|----------------------|-----------------|-----------------------------------|
| Mr. K.S.SENTHILKUMAR | DR.V.SARAVANAN  |                                   |

Co-ordinator  
Curriculum Development Cell  
Hindusthan College of Arts & Science,  
Coimbatore-641 028.

| DEPARTMENT OF INFORMATION TECHNOLOGY |             |             |  | CLASS: I M.Sc IT |                      |     |     |       |
|--------------------------------------|-------------|-------------|--|------------------|----------------------|-----|-----|-------|
| Sem                                  | Course Type | Course Code | Course Title                                   | Credits          | Contact Hours / Week | CIA | Ext | Total |
| I                                    | DSC         | 22ITP06     | Practical II<br>Object-Oriented<br>Programming | 3                | 5                    | 50  | 50  | 100   |

| Nature of Course             |                           |   |
|------------------------------|---------------------------|---|
| Knowledge and Skill Oriented | Employability Oriented    | ✓ |
|                              | Entrepreneurship Oriented | ✓ |
|                              | Skill Development         | ✓ |

| Course Objectives   |  |       |         |
|---|--|-------|---------|
| <ul style="list-style-type: none"> <li>• Deploys simple application using object oriented concepts using java</li> <li>• Applying the concepts of Framework applied in java.</li> <li>• Evaluate the techniques of RMI in java</li> <li>• Create a Simple application in GUI Environment.</li> <li>• Analyzing the concepts of Java Networking</li> </ul> |  |       |         |
| Ex.No   | PROGRAM LIST   | Hours | K-Level |
| 1.  | Demonstrate REMOTE METHOD INVOCATION application using Java                | 5     | Upto K5 |
| 2.  | Create an Event Driven Java Application. (Mouse Events or Keyboard Events) | 6     | Upto K5 |
| 3.  | Exhibit Socket Programming for Two way communication in java.              | 6     | Upto K5 |
| 4.  | Create a Java program to display IP ADDRESS and HOSTNAME of the machine.   | 5     | Upto K5 |
| 5.  | Illustrate a concept of inheritance with Servlet.                          | 5     | Upto K5 |
| 6.  | Design a java program to implement GUI WITH BORDER LAYOUT.                 | 6     | Upto K5 |
| 7.  | Create a Event Handler program using Spring Framework.                     | 5     | Upto K5 |
| 8.  | Create a Java Program to Establish Connection in JDBC.                     | 6     | Upto K5 |
| 9.  | Create a program to demonstrate a simple REST API                          | 5     | Upto K5 |
| 10.   | Demonstrate simple JAVABEANS applications.                                 | 5     | Upto K5 |
| 11.   | Build a java program to execute NETWORKING concept.                        | 5     | Upto K5 |
| 12.   | Design a java program to perform ANIMATION of different shapes.            | 6     | Upto K5 |

Note: The Questions should be asked in the ratio of 100% programs

**Pedagogy:** Chalk & Talk, Exercise, Assignments & PPTs.

**Rationale for Nature of the Course :** Able to understand structs hibernate and other frameworks in Java

### Course Learning Outcomes

| CLOs | On Completion of the Course, the students should be able to                   | K - Level  |
|------|---|------------|
| CLO1 | Observe and apply to develop simple GUI Applications                          | Upto<br>K5 |
| CLO2 | Extend on developing RMI Application  | Upto<br>K5 |
| CLO3 | Experiment with an application using Framework                                | Upto<br>K5 |
| CLO4 | Classify and implement the concepts of Hibernate                              | Upto<br>K5 |
| CLO5 | Evaluate the use of Java in a variety of technologies on different platforms. | Upto<br>K5 |

### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

| CLOs  | Programme Outcomes |      |      |      |      |      |      |
|-------|--------------------|------|------|------|------|------|------|
|       | PO 1               | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 |
| CLO 1 | 3                  | 3    | 2    | 3    | 3    | 3    | 3    |
| CLO 2 | 2                  | 2    | 2    | 3    | 3    | 2    | 3    |
| CLO 3 | 3                  | 3    | 3    | 2    | 3    | 3    | 3    |
| CLO 4 | 3                  | 2    | 2    | 3    | 3    | 2    | 3    |
| CLO 5 | 3                  | 3    | 3    | 3    | 3    | 3    | 2    |

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

| Course Designed by | Verified by HOD | Approved by CDC<br>Co-coordinator |
|--------------------|-----------------|-----------------------------------|
| Dr.S.SASIKALA      | DR.V.SARAVAMAN  |                                   |

Co-ordinator  
Curriculum Development Cell  
Hindusthan College of Arts & Science,  
Coimbatore-641 028.

| DEPARTMENT OF INFORMATION TECHNOLOGY |             |             |                           | CLASS: I M.Sc IT |                      |     |     |       |
|--------------------------------------|-------------|-------------|---------------------------|------------------|----------------------|-----|-----|-------|
| Sem                                  | Course Type | Course Code | Course Title              | Credits          | Contact Hours / Week | CIA | Ext | Total |
| II                                   | DSC         | 22ITP08     | Advanced Operating System | 4                | 5                    | 50  | 50  | 100   |

| Nature of Course             |                           |   |
|------------------------------|---------------------------|---|
| Knowledge and Skill Oriented | Employability Oriented    | ✓ |
|                              | Entrepreneurship Oriented | ✓ |
|                              | Skill Development         | ✓ |

#### Course Objectives

- Analyzing the Main components of an OS & their functions.
- Applying Mechanisms of OS to handle processes and threads and their communications.
- Gaining insight into the components and management aspects of real time and mobile operating systems.
- Developing real-time algorithm for task scheduling.
- Designing how Distributed Shared Memory is managed

| Unit | Course Contents  | Hours | K Level |
|------|--|-------|---------|
| I    | <b>Basics of Operating Systems:</b> What is an Operating System? – Mainframe Systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real-Time Systems – Handheld Systems – Feature Migration – Computing Environments – Process Scheduling – Cooperating Processes – InterProcess Communication – Deadlocks – Prevention – Avoidance – Detection – Recovery. | 15    | Upto K5 |
| II   | <b>Distributed Operating Systems:</b> Issues – Communication Primitives – Lamport's Logical Clocks – Deadlock handling strategies – Issues in deadlock detection and resolution distributed file systems – design issues – Case studies – The Sun Network File System – Coda   | 11    | Upto K5 |
| III  | <b>Real time Operating Systems:</b> Introduction – Applications of Real Time Systems – Basic Model of Real Time System – Characteristics – Safety and Reliability – Real Time Task Scheduling  | 13    | Upto K5 |
| IV   | <b>Operating Systems for Handheld Systems:</b> Requirements – Technology Overview – Handheld   | 13    | Upto K5 |



|   |  |    |         |
|---|--|----|---------|
|   | Operating Systems – Palm OS- Symbian Operating System- Android– Architecture of android–Securing hand held systems   |    |         |
| V | <b>Case Studies:</b> Linux System: Introduction – Memory Management – Process Scheduling Scheduling Policy- Managing I/O devices –Accessing Files-IOS: Architecture and SDK Framework - Media Layer - Services Layer - Core OS Layer - File system | 13 | Upto K5 |

Note: The Questions should be asked in the ratio of 100% theory

### Book for Study

1. William Stallings, **-Operating systems**, Pearson Prentice Hall, 7th Edition, 2011.

### Books for Reference

1. Pradeep K Sinha, **-Distributed Operating Systems: Concepts and Design**, Prentice Hall of India, Third edition 2007
2. Abraham Silberschatz; Peter Baer Galvin; Greg Gagne, "Operating System Concepts", Seventh Edition, John Wiley & Sons, First edition 2004.
3. Rajib Mall, —"Real-Time Systems: Theory and Practice", Pearson Education India, 2006. Edition-II.
4. Pramod Chandra P. Bhatt, "An introduction to operating systems", concept and practice, PHI, Third edition, 2010.
5. Achyut S. Godbole, Atul Kahate, —Operating Systems, McGraw Hill Education, Third edition, 2016.

### Web Resources

1. <https://www.docsity.com/en/notes-for-distributed-operating-system/2725203/>
2. [https://techworldthink.github.io/MCA/Download/S2/EI%20-20OS/FULL/OS\\_MD\\_1.pdf](https://techworldthink.github.io/MCA/Download/S2/EI%20-20OS/FULL/OS_MD_1.pdf)

**Pedagogy** :Chalk& Talk, Exercise, Assignments & PPTs.

**Rationale for Nature of the Course** :Gain a sufficient knowledge in Distributed operating system

### Activities to be given

1. Installing operating system in lab sessions
2. Hard Disk Formatting procedures and memory management task is implemented
3. Software Raid concept implemented in Lab Sessions

### Course Learning Outcomes

| CLOs | On Completion of the Course, the students should be able to   | K - Level  |
|------|---|------------|
| CLO1 | Analyzing the importance of computer system resources and the role of operating systems in their management policies and algorithms.  | Upto<br>K5 |
| CLO2 | Applying the concepts of Distributed Operating Systems in real time   | Upto<br>K5 |
| CLO3 | Illustrate real time OS applications  | Upto<br>K5 |
| CLO4 | Focus on latest Operating Systems and its methodologies.  | Upto<br>K5 |
| CLO5 | Test Problem-solving schemes as correct, efficient, and well-structured programs, and can integrate the programs into the computing infrastructure as functional information systems. | Upto<br>K5 |


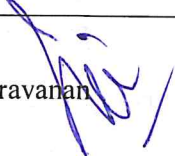

### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

| CLOs  | Programme Outcomes |      |      |      |      |      |      |
|-------|--------------------|------|------|------|------|------|------|
|       | PO 1               | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 |
| CLO 1 | 2                  | 2    | 2    | 3    | 3    | 3    | 2    |
| CLO 2 | 2                  | 3    | 2    | 3    | 3    | 3    | 3    |
| CLO 3 | 3                  | 2    | 2    | 3    | 3    | 3    | 3    |
| CLO 4 | 2                  | 2    | 2    | 2    | 3    | 2    | 2    |
| CLO 5 | 3                  | 3    | 3    | 3    | 3    | 3    | 3    |

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

| Course Designed by   | Verified by HOD   | Approved by CDC<br>Co-coordinator  |
|--|---|--|
| <br>Ms.G.Siva Brindha | <br>Dr. V. Saravanan |  |

Co-ordinator  
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Coimbatore-641 028.

| DEPARTMENT OF INFORMATION TECHNOLOGY |             |             |                                  | CLASS: I M.Sc IT |                      |     |     |       |
|--------------------------------------|-------------|-------------|----------------------------------|------------------|----------------------|-----|-----|-------|
| Sem                                  | Course Type | Course Code | Course Title                     | Credits          | Contact Hours / Week | CIA | Ext | Total |
| II                                   | DSC         | 22ITP09     | Advanced Networking Technologies | 4                | 5                    | 50  | 50  | 100   |

| Nature of Course             |                           |   |
|------------------------------|---------------------------|---|
| Knowledge and Skill Oriented | Employability Oriented    | ✓ |
|                              | Entrepreneurship Oriented | ✓ |
|                              | Skill Development         | ✓ |

| Course Objectives  |   |       |         |
|--|---|-------|---------|
| <ul style="list-style-type: none"> <li>To apply the issue of data flow and selecting the network media.</li> <li>To categorize the difference between static and dynamic routing protocols.</li> <li>To analyze the use of the Wire shark network protocol analyzer.</li> <li>To examine the issues of wireless security and Learning the basics of VoIP.</li> <li>To analyzing the concept of BGP and IPv6 over the Internet</li> </ul> |   |       |         |
| Unit   | Course Contents   | Hours | K Level |
| I  | <b>Introduction to Physical Network Design:</b> Core- Distribution Layer - Access Layer - Data Flow - Selecting the Media- IP Subnet Design- VLAN Network- Virtual LAN-Configuration and Tagging. Routed Network- Router- Gateway Address- Network Segments- Multilayer Switch- Layer 3 Routed Networks- Routed Port Configuration-Inter-VLAN Routing Configuration- Serial and ATM Port Configuration. | 13    | Upto K5 |
| II   | <b>Advanced Router Configuration I:</b> Configuring Static Routing - Dynamic Routing Protocols - Configuring RIPv2 – TFTP—Trivial File Transfer Protocol. <b>Advanced Router Configuration II:</b> Configuring Link State Protocols— OSPF- Configuring Link State Protocols-IS-IS-Configuring Hybrid Routing Protocols—EIGRP  | 13    | Upto K5 |
| III  | <b>Configuring and managing the networkInfrastructure:</b> Domain Name and IP Assignment- Ip Management With DHCP- Scaling the Network with NAT And PAT- DOMAIN NAME SERVICE (DNS) Introduction to Analyzing Network Data Traffic: ProtocolAnalysis/Forensics-Wire shark Protocol Analyzer-Analyzing Network Data Traffic-Filtering.  | 13    | Upto K5 |
| IV   | <b>Network Security:</b> Denial of Service-Firewalls and Access Lists-Router Security-Switch Security-Wireless Security-VPN Security. Introduction to VoIP- The Basics of Voice over IP- Voice over IP Networks- VoIP Security  | 13    | Upto K5 |
| V  | <b>Internet Routing—BGP:</b> Configuring BGP- BGP Best Path Selection- IPv6 over the Internet- Configuring BGP on JUNIPER Routers   | 13    | Upto K5 |

Note: The Questions should be asked in the ratio of 100% theory

**Book for Study**

1. Jeffrey S. Beasley, PiyasatNilkaew - "A Practical Guide to Advanced Networking",2015, Pearson

**Books for Reference**

1. Alberto Leon-Garcia, IndraWidjaja -Communication Networks, Second Edition, McGraw-Hill Education,2003
2. Shaikh Farhan, Shaikh MohdAshfaque -Advanced Networking Technologies Tech-Neo Publications LLP,2019
3. R. J. Cesarone, R. C. Hastrup, David Bell and G. Nelson"Architectural Design for a Mars Communications & Navigation Orbital Infrastructure "Jan 2000
4. K. B. Bhasin and Jeffrey HaydenSpace"Internet architectures and technologies" for NASA enterprises
5. Handbook: "A Designer's Companion, Standards Information Network". O Bob, Al Hara and Petrick

**Web Resources**

1. <https://ptgmedia.pearsoncmg.com/images/9780789749048/samplepages/0789749041.pdf>
2. <https://www.princeton.edu/~ota/disk1/1993/9304/9304.PDF>

**Pedagogy:** Chalk & Talk, Exercise, Assignments & PPTs.

**Rationale for Nature of the Course :**The course provide the sufficient knowledge in configuring Cisco Routers

**Activities to be given**

1. Configure cisco router for a network using simulations
2. Configure RIP OSPF and other protocols in a network
3. Configure DNS server in a network

### Course Learning Outcomes

| CLOs | On Completion of the Course, the students should be able to | K - Level  |
|------|---|------------|
| CLO1 | Analyze the Physical Network Design                         | Upto<br>K5 |
| CLO2 | Apply the Static Routing and Dynamic Routing Protocols      | Upto<br>K5 |
| CLO3 | Illustrate router and Switch security                       | Upto<br>K5 |
| CLO4 | Classify the Network Data Traffic in realtime               | Upto<br>K5 |
| CLO5 | Find and experience the new protocols                       | Upto<br>K5 |


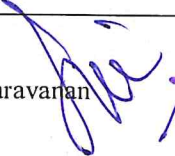
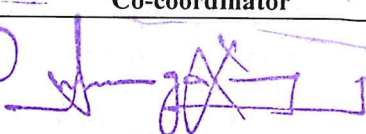
### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

| CLOs  | Programme Outcomes |      |      |      |      |      |      |
|-------|--------------------|------|------|------|------|------|------|
|       | PO 1               | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 |
| CLO 1 | 3                  | 2    | 2    | 2    | 3    | 2    | 3    |
| CLO 2 | 2                  | 2    | 2    | 3    | 3    | 3    | 3    |
| CLO 3 | 2                  | 3    | 3    | 2    | 3    | 2    | 3    |
| CLO 4 | 2                  | 2    | 2    | 3    | 3    | 2    | 2    |
| CLO 5 | 2                  | 2    | 3    | 2    | 3    | 2    | 3    |

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

| Course Designed by  | Verified by HOD   | Approved by CDC<br>Co-coordinator  |
|---|---|--|
| <br>Ms. U. Sinhuja | <br>Dr. V. Saravanan |  |

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| DEPARTMENT OF INFORMATION TECHNOLOGY |             |             |                                | CLASS: I M.Sc IT |                      |     |     |       |
|--------------------------------------|-------------|-------------|--------------------------------|------------------|----------------------|-----|-----|-------|
| Sem                                  | Course Type | Course Code | Course Title                   | Credits          | Contact Hours / Week | CIA | Ext | Total |
| II                                   | DSC         | 22ITP10     | Mobile Application Development | 4                | 5                    | 50  | 50  | 100   |

| Nature of Course             |                           |   |
|------------------------------|---------------------------|---|
| Knowledge and Skill Oriented | Employability Oriented    | ✓ |
|                              | Entrepreneurship Oriented | ✓ |
|                              | Skill Development         | ✓ |

| Course Objectives   |   |       |         |
|---|---|-------|---------|
| <ul style="list-style-type: none"> <li>• Apply the fundamental concepts of Android studio and other application</li> <li>• Explore Life cycle of an application in Android</li> <li>• Design to create a new application in Mobile environment.</li> <li>• Develop Debug and Deploy Android applications</li> <li>• Construct user interface with Built in view &amp;Layouts</li> </ul> |   |       |         |
| Unit  | Course Contents   | Hours | K Level |
| I   | <b>INTRODUCTION TO ANDROID:</b><br>What is Android - History and Version - Installing software's - Setup Eclipse - Hello Android example - Internal Details - Dalvik VM - Software Stack - Android Core Building Blocks - Android Emulator - AndroidManifest.xml - R.java file - Hide Title Bar - Screen Orientation.   | 13    | Upto K5 |
| II  | <b>WIDGETS &amp; USER INTERFACE:</b><br>Working with Button - Toast - Custom Toast - Button - Toggle Button - Switch Button - Image Button - Check Box - Alert Dialog - Spinner - Auto Complete Text View - Rating Bar - Date Picker - Time Picker - Progress Bar - Quick Contact Budge - Analog Clock and Digital Clock - Working with hardware Button - File Download | 13    | Upto K5 |
| III   | <b>ACTIVITY, INTENT &amp; FRAGMENT:</b> Activity Lifecycle - Activity Example - Implicit Intent - Explicit Intent - Fragment Lifecycle -Fragment Example - Dynamic Fragment. Android Menu. <b>LAYOUT&amp;VIEW:</b><br>Option Menu - Context Menu - Popup Menu - Relative Layout - Linear Layout - Table Layout - Grid Layout  | 13    | Upto K5 |
| IV  | <b>ANDROID ADAPTOR VIEW:</b> Array Adaptor - Array List Adaptor - Base Adaptor - Grid View - Web View - Scroll View - Search View - Tab Host - Dynamic List View - Expanded List View. <b>ANDROID SERVICES:</b> Android Service - Android Service   | 13    | Upto K5 |

|   |  |    |            |
|---|--|----|------------|
|   | API - Android Started Service - Android Bound Service - Android Service Life Cycle - Android Service Example   |    |            |
| V | <b>Data Storage:</b><br>Shared Preferences - Internal Storage - External Storage SQLite:<br>SQLite API – SQ Lite Spinner – SQ Lite List View - API - Android<br>Web Services | 13 | Upto<br>K5 |

Note: The Questions should be asked in the ratio of 100% theory

### Book for Study

1. Android Developer Fundamental course - "**Learn to Develop Android Applications**" – Google Developer Training Team 2016.

### Books for Reference

1. "The Busy Coder's Guide to Advanced Android Development Paperback" – Import, 20 July 2011 by Mr. Mark L Murphy
2. "Android Application Development for Dummies" 3rd Edition published by John Wiley & Sons, Inc. 2015
3. "Android Programming for Beginners" John Horton - December 2015
4. "Complete Introduction for Beginners" – Step By Step Guide How to Create Your Own Android App Easy! - Matthew Gimson - 2015
5. "Mobile App Development with HTML5" Paperback – March 10, 2015

### Web Resources

1. <https://books.goalkicker.com/AndroidBook/>
2. <https://www.cs.cmu.edu/~bam/uicourse/830spring09/BFeiginMobileApplicationDevelopment.pdf>

**Pedagogy:** Chalk & Talk, Exercise, Assignments & PPTs.

**Rationale for Nature of the Course :** The course brings the knowledge on Mobile application development

### Activities to be given

1. Install Android Studio and JVM application
2. Create Android application using ACTIVITY LIFE CYCLE
3. Demonstrate the application virtually through web environment

### Course Learning Outcomes

| CLOs | On Completion of the Course, the students should be able to                  | K-Level |
|------|--|---------|
| CLO1 | Analyse and develop simple GUI Applications                                  | Upto K5 |
| CLO2 | Extend and able to use widgets with components in their android applications | Upto K5 |
| CLO3 | Apply to work with database locally & cloud                                  | Upto K5 |
| CLO4 | Examine to deploy the applications by inheriting web services                | Upto K5 |
| CLO5 | Estimate Data Storage using SQ Lite  | Upto K5 |

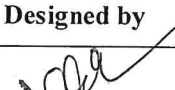
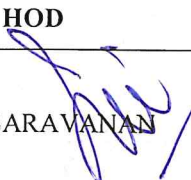
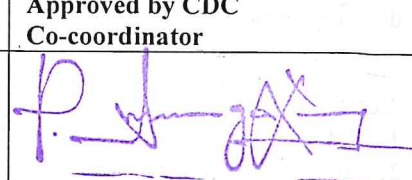
### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

| CLOs  | Programme Outcomes |      |      |      |      |      |      |
|-------|--------------------|------|------|------|------|------|------|
|       | PO 1               | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 |
| CLO 1 | 2                  | 2    | 3    | 2    | 2    | 3    | 3    |
| CLO 2 | 3                  | 3    | 3    | 2    | 2    | 2    | 3    |
| CLO 3 | 2                  | 2    | 2    | 3    | 2    | 3    | 2    |
| CLO 4 | 2                  | 3    | 3    | 2    | 2    | 2    | 2    |
| CLO 5 | 2                  | 2    | 2    | 2    | 2    | 3    | 3    |

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

| Course Designed by  | Verified by HOD  | Approved by CDC Co-coordinator   |
|---|--|--|
| <br>Mr. K.S.SENTHILKUMAR | <br>Dr. V.SARAVANAN |  |

Co-ordinator  
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 Coimbatore-641 028.



| DEPARTMENT OF INFORMATION TECHNOLOGY |             |             |  | CLASS: I M.Sc IT |                      |     |     |       |
|--------------------------------------|-------------|-------------|--|------------------|----------------------|-----|-----|-------|
| Sem                                  | Course Type | Course Code | Course Title                               | Credits          | Contact Hours / Week | CIA | Ext | Total |
| II                                   | DSC         | 22ITP11     | Software Engineering with Agile and DevOps | 4                | 4                    | 50  | 50  | 100   |

| Nature of Course             |                           |   |
|------------------------------|---------------------------|---|
| Knowledge and Skill Oriented | Employability Oriented    | ✓ |
|                              | Entrepreneurship Oriented | ✓ |
|                              | Skill Development         | ✓ |

| Course Objectives   |  |       |         |
|---|--|-------|---------|
| <ul style="list-style-type: none"> <li>• Applying the agile and Scrum basics in Software Engineering</li> <li>• Analyzing Product Inception strategies and Scaled agile frameworks</li> <li>• Creating the Estimation, Agile forecasting and project Management ideas</li> <li>• Exploring Sprints and Agile Testing</li> <li>• Applying DevOps concepts in real time project handling</li> </ul> |  |       |         |
| Unit  | Course Contents  | Hours | K Level |
| I   | <b>Introduction to Agile:</b> Agile versus traditional method comparisons and process tailoring Software Process Models – overview, Introduction to Agile, Various Agile methodologies - Scrum, XP, Lean, and Kanban, Agile Manifesto, Scrum: Scrum process, roles - Product Owner, ScrumMaster, Team, Project Manager, product manager, architect, events, and artifacts  | 10    | Upto K5 |
| II  | <b>Product Inception:</b> Product vision, stakeholders, initial backlog creation; Agile Requirements - User personas, story mapping, user stories, 3Cs, INVEST, acceptance criteria, sprints, requirements, product backlog and backlog grooming; <b>Tools:</b> Agile tracking tools such as JIRA; Scaled agile frameworks: SAFe, Scrum@Scale, Disciplined Agile   | 10    | Upto K5 |
| III   | <b>Definition of Done</b> , Definition of Ready; <b>Estimation;</b> Agile forecasting and project Management - Big visible information radiators, velocity, progress tracking, Track Done pattern, project forecasting, Ux Design, Control the Flow: Sprint Planning, Sprint Reviews, Sprint Retrospectives, Sprint Planning - Agile release and iteration (sprint) planning, Develop Epics and Stories, Estimating Stories, Prioritizing Stories (WSJF technique from SAFe), Create product roadmap | 10    | Upto K5 |
| IV  | <b>Sprints:</b> Iterations/Sprints Overview. Velocity Determination, Iteration Planning Meeting, Iteration, Planning Guidelines, Development, Testing, Daily Stand-up Meetings, Progress Tracking, Velocity Tracking, Monitoring and Controlling: Burn down Charts, Inspect & Adapt (Fishbone Model), Agile Release Train  | 12    | Upto K5 |

|   |   |    |            |
|---|---|----|------------|
|   | <b>Testing:</b> Functionality Testing, UI Testing, Performance Testing, Security Testing, Tools - Selenium Agile Testing: Principles of agile testers; The agile testing quadrants, Agile automation, Test automation pyramid   |    |            |
| V | <b>DevOps:</b> Continuous Integration and Continuous Delivery CI/CD: Jenkins Creating pipelines, Setting up runners Containers and container orchestration (Dockers and Kubernetes) for application development and deployment; Checking build status; Fully Automated Deployment; Continuous monitoring with Nagios; Introduction to DevOps on Cloud | 10 | Upto<br>K5 |

Note: The Questions should be asked in the ratio of 100% theory

### Book for Study

1. Agile Project Management: Managing for Success, By James A. Crowder, Shelli Friess, Springer, 2014
2. DevOps: Continuous Delivery, Integration, and Deployment with DevOps: Dive. By SricharanVadapalli, Packt, 2018

### Books for Reference

1. Learning Agile: Understanding Scrum, XP, Lean, and Kanban, By Andrew Stellman, Jennifer Greene, 2015, O'Reilly
2. Agile Project Management: Creating Innovative Products, Second Edition By Jim Highsmith, Addison-Wesley Professional, 2009
3. DevOps: Puppet, Docker, and Kubernetes By Thomas Uphill, John Arundel, Neependra Khare, Hideto Saito, Hui-Chuan Chloe Lee, Ke-Jou Carol Hsu, Packt, 2017
4. Clean Code: A Handbook of Agile Software Craftsmanship is a book written by Robert. C. Martin, PHI publishers, Edition-I, 2017.
5. DevOps: Puppet, Docker, and Kubernetes By Thomas Uphill, John Arundel, Neependra Khare, Hideto Saito, Hui-Chuan Chloe Lee, Ke-Jou Carol Hsu, Packt, 2017

### Web Resources

1. [www.mattivuori.net](http://www.mattivuori.net)

**Pedagogy:** Chalk & Talk, Exercise, Assignments & PPTs.

**Rationale for Nature of the Course :** The course brings the knowledge on Software development

### Activities to be given

1. Simple Software Application Development
2. Scrum and Agile Meeting Activity about Software Product
3. Testing the Software application

### Course Learning Outcomes

| CLOs | On Completion of the Course, the students should be able to   | K-Level |
|------|---|---------|
| CLO1 | Creating the background of an Agile project and the roles and responsibilities.   | Upto K5 |
| CLO2 | Remembering quality in an Agile project and Adapt existing testing experience and knowledge of Agile values and principles.   | Upto K5 |
| CLO3 | Apply relevant methods and techniques for testing in an Agile project and test automation activities.   | Upto K5 |
| CLO4 | Assist business stakeholders in defining understandable and testable user stories, scenarios, requirements and acceptance criteria as appropriate.  | Upto K5 |
| CLO5 | Working with other team members using effective communication styles and channels, The various tools available to Agile test teams including DevOps to facilitate the testing of the project. | Upto K5 |


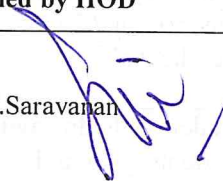
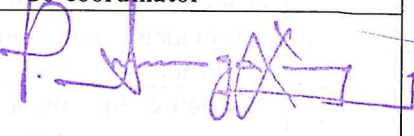
### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

| CLOs  | Programme Outcomes |      |      |      |      |      |      |
|-------|--------------------|------|------|------|------|------|------|
|       | PO 1               | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 |
| CLO 1 | 3                  | 3    | 2    | 2    | 3    | 3    | 3    |
| CLO 2 | 3                  | 3    | 3    | 2    | 2    | 2    | 2    |
| CLO 3 | 3                  | 2    | 2    | 3    | 2    | 3    | 3    |
| CLO 4 | 2                  | 3    | 3    | 2    | 2    | 2    | 3    |
| CLO 5 | 3                  | 2    | 2    | 2    | 2    | 3    | 2    |

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

| Course Designed by  | Verified by HOD   | Approved by CDC Co-coordinator   |
|---|---|--|
| <br>Ms. U. Sinhuja | <br>Dr. V. Saravanan |  |

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| DEPARTMENT OF INFORMATION TECHNOLOGY |             |             |  | CLASS : I M.Sc IT |                      |     |     |       |
|--------------------------------------|-------------|-------------|--|-------------------|----------------------|-----|-----|-------|
| Sem                                  | Course Type | Course Code | Course Title                                   | Credits           | Contact Hours / Week | CIA | Ext | Total |
| II                                   | DSC         | 22ITP12     | Practical III:<br>Advanced Network Programming | 3                 | 5                    | 50  | 50  | 100   |

| Nature of Course             |                           |   |
|------------------------------|---------------------------|---|
| Knowledge and Skill Oriented | Employability Oriented    | ✓ |
|                              | Entrepreneurship Oriented | ✓ |
|                              | Skill Development         | ✓ |

### Course Objectives

- Apply the issue of data flow and selecting the network media.
- Evaluate the difference between static and dynamic routing protocols.
- Experience the Wire shark network protocol analyzer.
- Examine the issues of wireless security and Learning the basics of VoIP.
- Analyze the concept of BGP and IPv6 over the Internet

| Ex.No | PROGRAM LIST   | Hours | K-Level |
|-------|--|-------|---------|
| 1     | Connect the computers in Local Area Network.   | 6     | Upto K5 |
| 2     | Configure the Router and generate the commands to configure network  | 6     | Upto K5 |
| 3     | Configure a Network Topology using packet tracer software.   | 6     | Upto K5 |
| 4     | Installation and connecting to a CISCO Router, as well as an overview of the interfaces. Basic router setup and commands are covered in this tutorial.   | 6     | Upto K5 |
| 5     | Setup of IP addressing for a number of network topology in a given scenario.   | 6     | Upto K5 |
| 6     | Customize a DHCP Server to provide a pool of four IP devices with contiguous IP addresses, a default gateway, and a default DNS address. Integrate a DHCP server with a BOOTP on to support Windows and Linux OS binaries automatically based on the client's MAC address. | 7     | Upto K5 |
| 7     | Configure, implement and debug the following:<br>Use open-source tools for debugging and diagnostics.<br>a. ARP/RARP Protocols b) IP routing   | 7     | Upto K5 |

|    |  |   |         |
|----|--|---|---------|
|    | protocols<br>c) BGP routing<br>d) OSPF routing protocols<br>e) Static routes (check using net stat)  |   | Upto K5 |
| 8  | Setup DNS: Build a cache DNS client and a DNSProxy; enforce reverseDNS and forward DNS; characterize traffic using TCP dump /Wire Shark when the DNS server is up and down.  | 7 | Upto K5 |
| 9  | Optimize an FTP server on a Linux/Windows computer and characterize the file transfer rate for a cluster of small files of 100k each and a 700mb video file using an FTP client/s FTP client. Repeat the experiment using a TFTP client. | 7 | Upto K5 |
| 10 | Installation IMAP/POP mail server and build a simple SMTP client in C/C++/Java to send and receive emails.   | 7 | Upto K5 |

Note: The Questions should be asked in the ratio of 100% programs

**Pedagogy :** Chalk & Talk, Exercise, Assignments & PPTs.

**Rationale for Nature of the Course :** The practical session establish the student knowledge on configuring FTP DNS IMAP/POP3

### Course Learning Outcomes

| CLOs | On Completion of the Course, the students should be able to      | K - Level |
|------|--|-----------|
| CLO1 | Tabulate the Physical Network Design                             | Upto K5   |
| CLO2 | Restate Configuring Static Routing and Dynamic Routing Protocols | Upto K5   |
| CLO3 | Establish and Compare a router and Switch security               | Upto K5   |
| CLO4 | Analyze a Network Data Traffic                                   | Upto K5   |
| CLO5 | Estimate the new version protocols                               | Upto K5   |

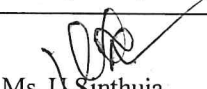
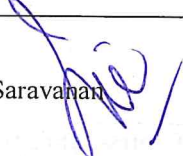
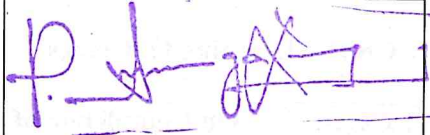
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3 – Advance Application

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| Course Designed by   | Verified by HOD   | Approved by CDC Co-coordinator   |
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|--------------------------------------|-------------|-------------|---|------------------|----------------------|-----|-----|-------|
| Sem                                  | Course Type | Course Code | Course Title                                    | Credits          | Contact Hours / Week | CIA | Ext | Total |
| II                                   | DSC         | 22ITP13     | Practical IV:<br>Mobile Application Programming | 3                | 5                    | 50  | 50  | 100   |

| Nature of Course             |                           |   |
|------------------------------|---------------------------|---|
| Knowledge and Skill Oriented | Employability Oriented    | ✓ |
|                              | Entrepreneurship Oriented | ✓ |
|                              | Skill Development         | ✓ |

#### Course Objectives

- Ability to use Android studio and Eclipse Environment
- Able to Create GUI application with Multi-screen Templates
- Deploy SQLite with Application
- Design their application using Web Services
- Construct user interface with Built in view & Layouts

| Ex. No | PROGRAM LIST   | Hours | K-Level |
|--------|--|-------|---------|
| 1.     | Create a simple Login App using Database   | 6     | Upto K5 |
| 2.     | Design and implement a single screen app that displays information about a fictional small business                                      | 7     | Upto K5 |
| 3.     | Build a Score Keeper app, which gives a user the ability to keep track of the score of two different teams playing a game of your choice | 7     | Upto K5 |
| 4.     | Create a simple file upload program with user authentication   | 6     | Upto K5 |
| 5.     | Create a simple application to find a Location of your android device  | 6     | Upto K5 |
| 6.     | Create a simple dictionary App   | 6     | Upto K5 |
| 7.     | The Quiz App   | 7     | Upto K5 |
| 8.     | Musical Structure App  | 6     | Upto K5 |
| 9.     | Tour Guide App   | 7     | Upto K5 |
| 10.    | News App   | 7     | Upto K5 |

Note: The Questions should be asked in the ratio of 100% programs

**Pedagogy:** Chalk & Talk, Exercise, Assignments & PPTs.

**Rationale for Nature of the Course :** The practical session establish the student knowledge with android studio.

### Course Learning Outcomes

| CLOs | On Completion of the Course, the students should be able to                              | K - Level  |
|------|--|------------|
| CLO1 | Analyze and Define a Mobile Application using Android Studio                             | Upto<br>K5 |
| CLO2 | Interpret to use widgets and components in their android applications                    | Upto<br>K5 |
| CLO3 | Apply to work with database locally & cloud  | Upto<br>K5 |
| CLO4 | Examine to deploy the applications by inheriting web services.                           | Upto<br>K5 |
| CLO5 | Asses various Android applications related to layouts & rich uses interactive interfaces | Upto<br>K5 |

### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

| CLOs  | Programme Outcomes |      |      |      |      |      |      |
|-------|--------------------|------|------|------|------|------|------|
|       | PO 1               | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 |
| CLO 1 | 3                  | 3    | 2    | 3    | 3    | 3    | 3    |
| CLO 2 | 2                  | 2    | 2    | 3    | 2    | 3    | 3    |
| CLO 3 | 3                  | 3    | 3    | 2    | 3    | 2    | 3    |
| CLO 4 | 3                  | 2    | 2    | 3    | 3    | 3    | 3    |
| CLO 5 | 2                  | 2    | 2    | 3    | 2    | 2    | 2    |

3 – Advance Application

2 – Intermediate Level

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| Course Designed by   | Verified by HOD | Approved by CDC<br>Co-coordinator |
|----------------------|-----------------|-----------------------------------|
| Mr.K.S.Senthil kumar | Dr.V.Saravanan  |                                   |

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