COMPUTER SCIENCE AND ENGINEERING

M.TECH (COMPUTER SCIENCE AND ENGINEERING)

(NON-CBCS)

REGULATIONS, CURRICULUM AND SYLLABUS

(With effect from the Academic Year 2011 – 12)

PONDICHERRY UNIVERSITY
PUDUCHERRY – 605 014.
PONDICHERRY UNIVERSITY

PUDUCHERRY -605 014.

REGULATIONS FOR POST GRADUATE (M.Tech.) PROGRAMMES IN THE DISCIPLINE OF COMPUTER SCIENCE AND ENGINEERING (NON-CBCS)

(WITH EFFECT FROM JULY 2011)

M.Tech (Computer Science and Engineering)

1.0 ELIGIBILITY
Candidates for admission to the first semester of four semester M.Tech (Computer Science and Engineering) should have passed B.E / B.Tech in Computer Science and Engineering / Information Technology or M.C.A through regular course of study from an AICTE approved institution or an examination of any University or authority accepted by the Pondicherry University as equivalent thereto, with at least 55% marks in the degree examination or equivalent CGPA.

Note:
1. Candidates belonging to SC/ST who have a mere pass in the qualifying examination are eligible.
2. There is no age limit for M.Tech. programmes.

2.0 ADMISSION
The admission policy for various M.Tech. programmes shall be decided by the respective institutes offering M.Tech. programmes subject to conforming to the relevant regulations of the Pondicherry University.

3.0 STRUCTURE OF M.Tech. PROGRAMME

3.1 General
3.1.1. The M.Tech. Programmes are of semester pattern with 16 weeks of instruction in a semester.

3.1.2 The programme of instruction for each stream of specialization will consist of :
(i) Core courses (Compulsory)
(ii) Electives
(iii)Laboratory
(iv)Seminar
(v) Project work

3.1.3 The M.Tech. Programmes are of 4 semester duration.
3.1.4. Credits will be assigned to the courses based on the following general pattern:

(i) One credit for each lecture period
(ii) One credit for each tutorial period
(iii) Two credits for practical course
(iv) Two credits for seminar
(v) Twenty three credits for Project work divided into 9 credits for Phase-I and 14 credits for Phase – II.
(vi) One teaching period shall be of 60 minutes duration including 10 minutes for discussion and movement.

3.1.5 Regulations, curriculum and syllabus of the M.Tech. programme shall have the approval of Board of Studies and other Boards/ Committees/ Councils, prescribed by the Pondicherry University. The curriculum should be so drawn up that the minimum number of credits and other requirements for the successful completion of the programme will be as given in Table – 1.

**Table 1: Minimum credits and other requirements**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Description</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>M.Tech</strong></td>
<td><strong>(Full-Time)</strong></td>
</tr>
<tr>
<td>1</td>
<td>Number of Semesters</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Min. number of credits of the programme</td>
<td>72</td>
</tr>
<tr>
<td>3</td>
<td>Max. number of credits of the programme</td>
<td>75</td>
</tr>
<tr>
<td>4</td>
<td>Min. Cumulative Grade Point Average for pass</td>
<td>5</td>
</tr>
</tbody>
</table>
| 5     | Min. successful credits needed for registering in the next semester | Sem. I: 10  
<p>|       |                                          | Sem. II: 25                  |
|       |                                          | Sem. III: 40                 |
| 6     | Min. period of completion of programme (consecutive semesters) | 4                          |</p>
<table>
<thead>
<tr>
<th>7</th>
<th>Max. period of completion of programme (consecutive semesters)</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Number of core and elective courses</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>Seminar</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Project work (semesters)</td>
<td>2</td>
</tr>
</tbody>
</table>

3.1.6 A core course is a course that a student admitted to the M.Tech. programme must successfully complete to receive the degree. A student shall register for all the core courses listed in the curriculum.

3.1.7 Elective courses are required to be chosen from the courses offered by the department(s) in that particular semester from among the approved courses. A core course of one department may be chosen as an elective by a student from other department.

3.1.8 Each student is required to make a seminar presentation on any chosen topic connected with the field of specialisation. Preparation and presentation of a seminar is intended to investigate an in-depth review of literature, prepare a critical review and develop confidence to present the material by the student. The seminar shall be evaluated by a Department Committee constituted for this purpose, based on a report submitted by the candidate and a viva-voce conducted at the end of the semester.

3.1.9 Project work is envisaged to train a student to analyze independently any problem posed to him/her. The work may be analytical, experimental, design or a combination of both. The project report is expected to exhibit clarity of thought and expression. The evaluation of project work will be a continuous internal assessment based on two reviews, an internal viva-voce and an external viva-voce examination.

3.1.10 The medium of instruction, examination, seminar, directed study and project work will be in English.
4.0 REQUIREMENTS TO APPEAR FOR UNIVERSITY EXAMINATION

4.1 A candidate shall be permitted to appear for university examinations at the end of any semester only if he/she secures not less than 75% overall attendance arrived at by taking into account the total number of periods in all subjects put together offered by the institution for the semester under consideration. Candidates who secure overall attendance greater than 60% and less than 75% have to pay a condonation fee as prescribed by the University along with a medical certificate obtained from a medical officer not below the rank of Assistant Director to become eligible to appear for the examinations.

4.2 A candidate to secure eligibility towards continuing the Programme, he/she must have earned the minimum number of credits at the end of each semester as given in Table – 1. If he/she fail to satisfy this criterion in any semester, he/she shall be placed on scholastic probation in the succeeding semester.

4.3 His/Her conduct shall be satisfactory as certified by the Head of the institution.

5.0 EVALUATION

5.1 Evaluation of theory courses shall be based on 40% continuous internal assessment and 60% University examination. Evaluation of laboratory course shall be based on 50% internal assessment and 50% University examination. In each course, there shall be a 3 hour University examination.

5.2 The seminar will be evaluated internally for 100 marks. The total marks for the project work for M.Tech. programmes will be 300 marks for phase-I and 400 marks for phase-II. The allotment of marks for external valuation and internal valuation shall be as detailed below:

<table>
<thead>
<tr>
<th>Seminar (Internal valuation only) : 100 Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>First review</td>
</tr>
<tr>
<td>Second review</td>
</tr>
<tr>
<td>Report and Viva voce</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
**Project work – (Phase – I): 300 Marks**

<table>
<thead>
<tr>
<th>Internal valuation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide</td>
<td>50 marks</td>
</tr>
<tr>
<td>First Evaluation</td>
<td>50 marks</td>
</tr>
<tr>
<td>Second Evaluation</td>
<td>50 marks</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150 marks</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>External valuation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation (External Examiner Only)</td>
<td>50 marks</td>
</tr>
<tr>
<td>Viva voce (50 for Ext. + 50 for Int.)</td>
<td>100 marks</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150 marks</strong></td>
</tr>
</tbody>
</table>

**Project work – (Phase – II): 400 Marks**

<table>
<thead>
<tr>
<th>Internal valuation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide</td>
<td>100 marks</td>
</tr>
<tr>
<td>First Evaluation</td>
<td>50 marks</td>
</tr>
<tr>
<td>Second Evaluation</td>
<td>50 marks</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200 marks</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>External valuation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation (External Examiner Only)</td>
<td>50 marks</td>
</tr>
<tr>
<td>Viva voce (75 for Ext. + 75 for Int.)</td>
<td>150 marks</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200 marks</strong></td>
</tr>
</tbody>
</table>
Internal valuation should be done by a committee comprising of not less than 3 faculty members appointed by the Head of the Department and approved by the Head of the Institution.

5.3 The end-semester examination shall be conducted by the Pondicherry University for all the courses offered by the department. A model question paper, as approved by the Chairperson, BOS (ECE), Pondicherry University, for each course offered under the curriculum should be submitted to the University. The University examination shall cover the entire syllabus of the course.

5.4 The University shall adopt the double valuation procedure for evaluating the end-semester examinations, grading and publication of the results. Each answer script shall be evaluated by two experts. If the difference between the total marks awarded by the two examiners is not more than 15% of end-semester examination maximum marks, then the average of the total marks awarded by the two examiners will be reckoned as the mark secured by the candidate; otherwise, a third examiner is to be invited to evaluate the answer scripts and his/her assessment shall be declared final.

5.5 Continuous assessment of students for theory courses shall be based on two tests (15 marks each) and one assignment (10 marks). A laboratory course carries an internal assessment mark of 50 distributed as follows: (i) Regular laboratory exercises and records – 20 marks (ii) Internal laboratory test– 20 marks and (iii) Internal viva-voce – 10 marks.

5.6 All eligible students shall appear for the University examination.

6.0 Grading

6.1 The assessment of a course will be done on absolute marks basis. However, for the purpose of reporting the performance of a candidate, letter grades, each carrying stipulated points, will be awarded as per the range of total marks (out of 100) obtained by the candidate, as detailed below in Table – 2.

**TABLE 2: Letter Grade and the Corresponding Grade Point**

<table>
<thead>
<tr>
<th>Range of Total Marks</th>
<th>Letter Grade</th>
<th>Grade</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>90 to 100</td>
<td>S</td>
<td>10</td>
<td>EXCELLENT</td>
</tr>
<tr>
<td>80 to 89</td>
<td>A</td>
<td>9</td>
<td>VERY GOOD</td>
</tr>
<tr>
<td>70 to 79</td>
<td>B</td>
<td>8</td>
<td>GOOD</td>
</tr>
<tr>
<td>Range</td>
<td>Grade</td>
<td>Credit</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>--------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>60 to 69</td>
<td>C</td>
<td>7</td>
<td>ABOVE AVERAGE</td>
</tr>
<tr>
<td>55 to 59</td>
<td>D</td>
<td>6</td>
<td>AVERAGE</td>
</tr>
<tr>
<td>50 to 54</td>
<td>E</td>
<td>5</td>
<td>SATISFACTORY</td>
</tr>
<tr>
<td>0 to 49</td>
<td>F</td>
<td>0</td>
<td>FAILURE</td>
</tr>
<tr>
<td>Incomplete</td>
<td>FA</td>
<td>-</td>
<td>FAILURE DUE TO LACK OF ATTENDANCE/ FAILURE BY ABSENCE</td>
</tr>
</tbody>
</table>

6.2 A student is deemed to have completed a course successfully and earned the appropriate credit if and only if, he/she receives a grade of E and above. The student should obtain 40% of marks in the University examination in a subject to earn a successful grade.

6.3 A candidate who has been declared “Failed” in a course may reappear for that subject during the subsequent semesters and secure a pass. However, there is a provision for revaluation of failed or passed subjects provided he/she fulfills the following norms for revaluation.

(i) Applications for revaluation should be filed within 4 weeks from the date of declaration of results or 15 days from the date of receipt of marks card whichever is earlier.

(ii) The candidate should have attended all the university examinations.

(iii) The candidate should not have failed in more than two papers in the current university examination.

(iv) The request for revaluation must be made in the format prescribed and duly recommended by the Head of the Institution along with the revaluation fee prescribed by the University.

(v) Revaluation is not permitted for practical courses, seminar and project work.

6.4 The internal assessment marks secured by a student in a theory course shall be considered only during the first appearance. For the subsequent attempts, the marks secured by the student in the University examination shall be scaled up to the total marks. Further, the marks secured by the student in the University examination in the latest attempt shall alone remain valid in total suppression of the University examination marks secured by the student in earlier attempts.
7.0 DECLARATION OF RESULTS, RANK AND ISSUE OF GRADE CARD

7.1 The results will be declared and the grade cards will be issued to the students after completing the valuation process.

7.2 The grade cards will contain the following details:

(i) The college in which the candidate is studying/has studied.

(ii) The list of courses enrolled during the semester and the grades scored.

(iii) The Grade Point Average (GPA) for the semester and the Cumulative Grade Point Average (CGPA) of all enrolled subjects from first semester onwards.

7.3 GPA is the ratio of the sum of the products of the number of credits (C) of courses registered and the corresponding grades points (GP) scored in those courses, taken for all the courses and the sum of number of credits of all the courses

\[
GPA = \frac{\text{Sum of } (C \times GP)}{\text{Sum of } C}
\]

The sum will cover all the courses the student has taken in that semester, including those in which he/she has secured F.

7.4 CGPA will be calculated in a similar manner, considering all the courses enrolled from first semester. FA grades are to be excluded for calculating GPA and CGPA. If a student has passed in a course after failing in earlier attempts, the grade secured by the student in the successful attempt only will be taken into account for computing CGPA.

7.5 To convert CGPA into percentage marks, the following formula shall be used:

\[
\% \text{ Mark} = (CGPA - 0.5) \times 10
\]

7.6 A candidate who satisfies the course requirements for all semesters and passes all the examinations prescribed for all the four semesters within a maximum period of 10 semesters reckoned from the commencement of the first semester to which the candidate was admitted, shall be declared to have qualified for the award of degree.

7.7 A candidate who qualifies for the award of the degree shall be declared to have passed the examination in **FIRST CLASS** with **DISTINCTION** upon fulfilling the following requirements:

(i) Should have passed all the subjects pertaining to semesters 1 to 4 in his/her first appearance in 4 consecutive semesters starting from first semester to which the candidate was admitted.

(ii) Should not have been prevented from writing examinations due to lack of attendance.

(iii) Should have secured a CGPA of 8.50 and above for the semesters 1 to 4.
7.8 A candidate who qualifies for the award of the degree by passing all the subjects relating to semesters 1 to 4 within a maximum period of 6 consecutive semesters after his/her commencement of study in the first semester and in addition secures CGPA not less than 6.5 shall be declared to have passed the examination in **FIRST CLASS**.

7.9 All other candidates who qualify for the award of degree shall be declared to have passed the examination in **SECOND CLASS**.

7.10 A student with CGPA less than 5.0 is not eligible for the award of degree.

7.11 For the award of University rank and gold medal, the CGPA secured from 1st to 4th semester should be considered and it is mandatory that the candidate should have passed all the subjects from 1st to 4th semester in the first appearance and he/she should not have been prevented from writing the examination due to lack of attendance and should not have withdrawn from writing the University examinations.

8.0 **PROVISION FOR WITHDRAWAL**

A candidate may, for valid reasons, and on the recommendation of the Head of the Institution be granted permission by the University to withdraw from writing the entire semester examination as one unit. The withdrawal application shall be valid only if it is made earlier than the commencement of the last theory examination pertaining to that semester. Withdrawal shall be permitted only once during the entire programme. Other conditions being satisfactory, candidates who withdraw are also eligible to be awarded DISTINCTION whereas they are not eligible to be awarded a rank/gold medal.

9.0 **DISCONTINUATION FROM THE PROGRAMME**

If a candidate wishes to temporarily discontinue the programme for valid reasons, he/she shall apply through the Head of the Institution in advance and obtain a written order from the University permitting discontinuance. A candidate after temporary discontinuance may rejoin the programme only at the commencement of the semester at which he/she discontinued, provided he/she pays the prescribed fees to the University. The total period of completion of the programme reckoned from the commencement of the first semester to which the candidate was admitted shall not in any case exceed 4 years, including the period of discontinuance.

10.0 **REVISION OF REGULATIONS AND CURRICULUM**

The University may from time to time revise, amend or change the regulations of curriculum and syllabus as and when requirement for the same arises.
11.0 POWER TO MODIFY

11.1 Notwithstanding anything contained in the foregoing, the Pondicherry University shall have the power to issue directions/orders to remove any difficulty.

11.2 Nothing in the foregoing may be construed as limiting the power of the Pondicherry University to amend, modify or repeal any or all of the above.

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# M.TECH (COMPUTER SCIENCE AND ENGINEERING) –NON-CBCS

## CURRICULUM AND SCHEME OF EXAMINATION

(Total number of credits required for the completion of the programme: 72)

### SEMESTER – I

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Code</th>
<th>Subject</th>
<th>Hours / Week</th>
<th>Credits</th>
<th>Evaluation (marks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>L</td>
<td>T</td>
<td>P</td>
</tr>
<tr>
<td>1.</td>
<td>CS 901</td>
<td>Advanced Data Structures and Algorithms</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>CS 902</td>
<td>Design of Distributed Systems</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td>CS 903</td>
<td>Advanced Computer Architecture</td>
<td>3</td>
<td>1</td>
<td>0</td>
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<tr>
<td>4.</td>
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<td>Elective – I</td>
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<tr>
<td>6.</td>
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<td>Elective – III</td>
<td>3</td>
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<tr>
<td>7.</td>
<td>CS 908</td>
<td>Seminar</td>
<td>-</td>
<td>-</td>
<td>3</td>
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</table>

| Total   |        |                                              | 23 | 340 | 360 | 700 |

### SEMESTER – II

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Code</th>
<th>Subject</th>
<th>Hours / Week</th>
<th>Credits</th>
<th>Evaluation (marks)</th>
</tr>
</thead>
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<td></td>
<td></td>
<td></td>
<td>L</td>
<td>T</td>
<td>P</td>
</tr>
<tr>
<td>1.</td>
<td>CS 904</td>
<td>High Performance Networks</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>CS 905</td>
<td>Advances in Database Systems</td>
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<td>1</td>
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</table>
### SEMESTER – III

<table>
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<th>Code</th>
<th>Subject</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>Credits</th>
<th>Evaluation (marks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>Intern. Extern.  Total</td>
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<tr>
<td>1.</td>
<td>CS 909</td>
<td>Project Phase-I</td>
<td>-</td>
<td>-</td>
<td>16</td>
<td>9</td>
<td>150  150  300</td>
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<tr>
<td>2.</td>
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<td>Elective – VII</td>
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<td>0</td>
<td>3</td>
<td>40   60  100</td>
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<td></td>
<td></td>
<td></td>
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<td>12   190 210 400</td>
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### SEMESTER – IV

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<th>Code</th>
<th>Subject</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>Credits</th>
<th>Evaluation (marks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Intern. Extern.  Total</td>
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<tr>
<td>1.</td>
<td>CS 910</td>
<td>Project Phase II</td>
<td>-</td>
<td>-</td>
<td>24</td>
<td>14</td>
<td>200  200 400</td>
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<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>14   200 200 400</td>
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**LIST OF ELECTIVE SUBJECTS**

<table>
<thead>
<tr>
<th>SL.NO.</th>
<th>Code</th>
<th>SUBJECT</th>
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<tbody>
<tr>
<td>1</td>
<td>CS 921</td>
<td>Soft Computing</td>
</tr>
<tr>
<td>2</td>
<td>CS 922</td>
<td>Data warehousing and Data Mining</td>
</tr>
<tr>
<td>3</td>
<td>CS 923</td>
<td>Semantic Web and Knowledge Management</td>
</tr>
<tr>
<td>4</td>
<td>CS 924</td>
<td>Knowledge Management</td>
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<tr>
<td>5</td>
<td>CS 925</td>
<td>Real-Time Systems</td>
</tr>
<tr>
<td>6</td>
<td>CS 926</td>
<td>Web Services and Internet Engineering</td>
</tr>
<tr>
<td>7</td>
<td>CS 927</td>
<td>Service Oriented Architecture</td>
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<td>8</td>
<td>CS 928</td>
<td>Data Compression</td>
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<td>9</td>
<td>CS 929</td>
<td>Agent Technology</td>
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<tr>
<td>10</td>
<td>CS 930</td>
<td>Advanced Java Programming</td>
</tr>
<tr>
<td>11</td>
<td>CS 931</td>
<td>Software Architecture</td>
</tr>
<tr>
<td>12</td>
<td>CS 932</td>
<td>Ad Hoc and Sensor Networks</td>
</tr>
<tr>
<td>13</td>
<td>CS 933</td>
<td>Design of Embedded Systems</td>
</tr>
<tr>
<td>14</td>
<td>CS 934</td>
<td>Trusted Internet</td>
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<tr>
<td>15</td>
<td>CS 935</td>
<td>Internals of Operating Systems</td>
</tr>
<tr>
<td>16</td>
<td>CS 936</td>
<td>Cryptography</td>
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<tr>
<td>17</td>
<td>CS 937</td>
<td>Cloud and Utility Computing</td>
</tr>
<tr>
<td>18</td>
<td>CS 938</td>
<td>Mobile and Pervasive Computing</td>
</tr>
</tbody>
</table>
CS92 ADVANCED DATA STRUCTURES AND ALGORITHMS

UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V

REFERENCES

CS 902 DESIGN OF DISTRIBUTED SYSTEMS

UNIT - I
Introduction – Examples of Distributed Systems – Resource Sharing and the Web – Challenges-
System Models - Introduction – Architectural Models – Functional Models- Characterization of
Distributed Systems – Client-Server Communication – Distributed Objects and Remote
Invocation – Communication Between Distributed Objects – Remote Procedure Call – Events
and Notifications.

UNIT - II
Distributed Operating Systems - Introduction – Issues – Communication Primitives – Inherent
Limitations - Lamport’s Logical Clock; Vector Clock; Causal Ordering; Global State; Cuts;
Termination Detection. Distributed Mutual Exclusion – Non-Token Based Algorithms –
Lamport’s Algorithm - Token-Based Algorithms – Suzuki-Kasami’s Broadcast Algorithm –
Distributed Deadlock Detection – Issues – Centralized Deadlock-Detection Algorithms -
Distributed Deadlock-Detection Algorithms. Agreement Protocols – Classification - Solutions –
Applications.

UNIT- III
Distributed Resource Management - Distributed File systems – Architecture – Mechanisms –
Design Issues – Distributed Shared Memory – Architecture – Algorithm – Protocols - Design

UNIT- IV
Introduction to Distributed Algorithms, Kinds of Distributed Algorithm, Timing Models.
Synchronous Network Algorithms: Synchronous Network Model, Leader Election in a
synchronous Ring, Algorithms in a General Synchronous Networks, Distributed Consensus with

UNIT-V
of Access Matrix Model – Safety in the Access Matrix Model – Advanced Models of protection
– Data Security.

REFERENCES
   McGraw-Hill, 2001 [Units II - IV]
4. Ajay D. Kshemkalyani and Mukesh Singhal, “Distributed Computing – Principles,
CS 903 ADVANCED COMPUTER ARCHITECTURE

UNIT – I

UNIT – II

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UNIT – V
Parallel Models, Languages and Compilers - Parallel Programming Models, Parallel Languages and Compilers. Dependence Analysis of Data Arrays, Code Optimization and Scheduling, Loop Parallelization and Pipelining. Parallel Program Development and Environments - Parallel programming Environments, Synchronization and Multiprocessing Models, Shared-Variable Program Structures, Message-Passing program Development, Mapping Programs onto Multicomputers.

REFERENCES
UNIT- I

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REFERENCES
CS 905 ADVANCES IN DATABASE SYSTEMS

UNIT – I
Overview of Existing DBMS Models - Introduction to commercial and open source database systems- Need for Special databases like multimedia, embedded, web, spatial, temporal databases-JDBC-ODBC.

UNIT – II

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REFERENCES
CS 906 ADVANCED SOFTWARE ENGINEERING

UNIT – I

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UNIT – III

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UNIT – V
Software Quality Assurance Quality Metrics and Models, Software Reliability Theory Software Maintenance Software Configuration Management - Reverse Engineering and Re-engineering-Process Capability Maturity Models

REFERENCES

CS 921 SOFT COMPUTING

UNIT – I
Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence - Machine Learning Basics

UNIT – II
Introduction to Genetic Algorithms (GA) – Applications of GA in Machine Learning - Machine Learning Approach to Knowledge Acquisition.

UNIT – III

UNIT – IV

UNIT – V

REFERENCES
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REFERENCES
CS 923 SEMANTIC WEB AND KNOWLEDGE MANAGEMENT

UNIT - I

UNIT - II
Ontology Languages for the Semantic Web: Introduction - OIL and DAML+OIL Semantic web pyramid of languages - design rationale for OIL - OIL language constructs - Different syntactic forms - language layering - semantics - From OIL to DAML+OIL

UNIT - III

UNIT - IV
Resource Description Framework: what is RDF - distinction between RDF model and syntax - RDF features - RDF and XML - non-contextual modeling data modeling using RDF schema - Need for an RDFS query language Ontologies for semantic web: introduction - reading the web - information extraction knowledge generation from natural language documents

UNIT - V
Ontology based knowledge management - case studies - Semantic web tools

REFERENCES

CS 924 KNOWLEDGE MANAGEMENT

UNIT - I

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UNIT - III
Knowledge Elicitation Techniques – Modeling Communication Aspects – Knowledge Management and Organizational Learning.

UNIT - IV

UNIT - V

REFERENCES

CS 925 REAL-TIME SYSTEMS

UNIT - I

UNIT - II

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REFERENCES

CS 926 WEB SERVICES AND INTERNET ENGINEERING

UNIT – I

UNIT – II
Web services, Evolution and differences with Distributed computing, XML - Name Spaces - Structuring With Schemas and DTD - Transformation - XML Infrastructure WSDL, SOAP, UDDI, ebXML - SOAP And Web Services in E-Com - Overview Of .NET And J2EE.

UNIT - III

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UNIT - V

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UNIT - V
Transaction processing – paradigm – protocols and coordination – transaction specifications – SOA in mobile – research issues

REFERENCES
CS928 DATA COMPRESSION

UNIT – I

UNIT – II

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REFERENCES
CS 929 AGENT TECHNOLOGY

UNIT - I
Agent – Definition and Introduction – Abstract architectures for intelligent agents – Concrete architecture for intelligent agents – Agent Programming languages Multi-agent Systems and societies of Agents – Agent Communications – Agent Interaction Protocols.

UNIT - II

UNIT - III

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UNIT - V
Agents Development frameworks and languages – Development tools – applications of agents. Agent Oriented methodologies – Agent oriented analysis and design, Gaia methodology, MASE, OPEN process framework, Tropos, Agent UML.

REFERENCES

CS 930 ADVANCED JAVA PROGRAMMING

UNIT - I
JAVA Basics - Java streaming - Networking - Event handling - Multithreading - Byte code Interpretation - Customizing application - Data Structures - Collection classes.

UNIT - II

UNIT - III
JAVA Beans and Swing - Bean concepts - Events in bean box - Bean customization - Persistence - Application - deployment using swing - Advanced swing techniques - JAR file handling.

UNIT - IV
JAVA e-Applications - JNI - Servlets - Java Server Pages - JDBC - Session beans - Entity beans - Programming and deploying enterprise Java Beans - Java transactions.

UNIT - V
Related JAVA Techniques - Java Media Framework - 3D graphics - Internationalization - Case study - Deploying n-tier application, E-commerce applications.

REFERENCES

CS 931 SOFTWARE ARCHITECTURE

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REFERENCES

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REFERENCES
CS 933 DESIGN OF EMBEDDED SYSTEMS

UNIT - I
Embedded Computing - Challenges of Embedded Systems – Embedded system design process.
Embedded processors – ARM processor – Architecture, ARM and Thumb Instruction sets

UNIT - II
Embedded C Programming - C-looping structures – Register allocation – Function calls –
Pointer aliasing – structure arrangement – bit fields – unaligned data and endianness – inline
functions and inline assembly – portability issues.

UNIT - III
Optimizing Assembly Code - Profiling and cycle counting – instruction scheduling – Register
allocation – conditional execution – looping constructs – bit manipulation – efficient switches –
optimized primitives.

UNIT - IV
Processes and Operating systems - Multiple tasks and processes – Context switching –
Scheduling policies – Interprocess communication mechanisms – Exception and interrupt
handling - Performance issues.

UNIT - V
Embedded System Development - Meeting real time constraints – Multi-state systems and
function sequences. Embedded software development tools – Emulators and debuggers. Design
methodologies – Case studies – Windows CE – Linux 2.6x and RTLinux – Coding and sending
application layer byte stream on a TCP/IP network using RTOS Vxworks – Embedded system
for a smart card.

REFERENCES

McGraw-Hill companies, 2008
CS 934 TRUSTED INTERNET

UNIT - I

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UNIT - IV
E-Commerce Security: SET for E-Commerce Transactions, Business requirements for SET, SET System Participants, Dual Signature and Signature, Authentication and Message Integrity, Payment Processing.

UNIT - V

REFERENCES

CS 935 INTERNALS OF OPERATING SYSTEMS

UNIT I
Introduction to Kernel - Architecture of the UNIX operating system, System concepts, Data structures. Buffer Cache: Buffer header, Structure of Buffer pool, Reading and writing disk blocks. Files INODES, Structure of a regular file, Directories, Super block, Inode assignment.

UNIT II

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REFERENCES
CS 936 CRYPTOGRAPHY

UNIT I
Introduction – Beginning with a simple communication game – Wrestling between safeguard and attack – Encryption symmetric techniques.

UNIT II
Encryption – Asymmetric techniques – Bit security of the basic public key cryptographic functions.

UNIT III
Data Integrity Techniques – Authentication framework for public key cryptography.

UNIT IV
Formal and strong security definitions for public-key crypto systems – Provably secure and efficient public-key cryptosystems – Introduction – The optimal asymmetric encryption padding.

UNIT V
The Cramer–Shoup Public-key crypto systems – An overview of provably secure hybrid cryptosystems – Literature notes on practical and provably secure public-key cryptosystems – Strong and provable security for digital signatures.

REFERENCES

CS 937 CLOUD AND UTILITY COMPUTING

UNIT-I

UNIT-II
Federation in the Cloud - Presence in the Cloud - Privacy and its Relation to Cloud-Based Information Systems – Security in the Cloud - Common Standards in the Cloud – End-User Access to the Cloud Computing

UNIT –III

UNIT-IV

UNIT-V

REFERENCES

CS 938 MOBILE AND PERVERSIVE COMPUTING

UNIT I
Wireless networks- emerging technologies- Blue tooth, WiFi, WiMAX, 3G, WATM.- Mobile IP protocols - WAP push architecture- Wml scripts and applications.

UNIT II
Mobile computing environment—functions-architecture-design considerations, content architecture - CC/PP exchange protocol, context manager. Data management in WAE-Coda file system- caching schemes- Mobility QOS. Security in mobile computing.

UNIT III

UNIT IV
Pervasive Computing- Principles, Characteristics- interaction transparency, context aware, automated experience capture. Architecture for pervasive computing- Pervasive devices- embedded controls.- smart sensors and actuators - Context communication and access services

UNIT V

REFERENCES

Infrastructure and Faculty requirements for M.Tech(CSE)

Faculty–student ratio: 1:12 (As per AICTE norms for intake of 18: 1 Professor, 1 Associate Professor, 1 Assistant Professors)

Class room Equipment: Multimedia Projector, Black Board

Teacher qualification Specilzation: M.Tech. in Computer Science and Engineering

Class Room: 2, with the area of 30 sq.m

Laboratory: 1

<table>
<thead>
<tr>
<th>Resources</th>
<th>Batch size of 25 students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer System: Server</td>
<td>1 No.</td>
</tr>
<tr>
<td>Computer systems: node</td>
<td>18 No. connected in LAN</td>
</tr>
<tr>
<td>UPS</td>
<td>Minimum of 5 KVA</td>
</tr>
<tr>
<td>Printer</td>
<td>2 No.</td>
</tr>
<tr>
<td>User License required for software (proprietary)</td>
<td>Minimum 18 No.</td>
</tr>
<tr>
<td>Software</td>
<td></td>
</tr>
<tr>
<td>1. Microsoft Server OS/ Linux Server OS/ UNIX Server OS/Any open source server OS / any Proprietary Server OS software</td>
<td></td>
</tr>
<tr>
<td>2. Proprietary/ open source clients</td>
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<tr>
<td>3. Borland C Compiler / Microsoft C compiler/ any open source C compiler/ any Proprietary C compiler</td>
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<tr>
<td>4. Java development Kit (Latest Version)</td>
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<tr>
<td>6. DB2 Server / ORACLE server/ SQL Server/ Open source DBMS server software</td>
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<tr>
<td>7. Network simulator</td>
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<td>8. Open MP</td>
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