SRI SATHYA SAI INSTITUTE OF HIGHER LEARNING

(Deemed to be University)

(Effective from 2016-17 batch onwards)

ACADEMIC REGULATIONS

FOR

MASTER OF TECHNOLOGY
(COMPUTER SCIENCE)

SRI SATHYA SAI INSTITUTE OF HIGHER LEARNING
(Deemed to be University)

ACADEMIC REGULATIONS
FOR
MASTER OF TECHNOLOGY
(COMPUTER SCIENCE)

ADMISSION CRITERIA

REGULATION - 1: PROGRAMME OF STUDY

The degree of **Master of Technology in Computer Science** is a **four semester full-time course**. The duration of each semester is about 15 weeks.

REGULATION - 2: ADMISSION INTO M.Tech. PROGRAMME

a) (i) Candidates applying for M.Tech. (Computer Science) should have a consistently good academic record having secured a first class (60% in aggregate) both at the degree and M.Sc.(Mathematics)/ M.Sc.(Physics)/ M.Sc.(Computer Science)/B.E./B.Tech./MCA/ Integrated MCA levels of examination with Computer Science as background and equivalent degree. English as the medium of Instruction is preferred. Candidates belonging to Scheduled Castes / Scheduled Tribes are entitled to a relaxation of 5% marks.

  (ii) Candidates applying for Admission Test need not wait for the announcement of their final results or for the arrival of final year/semester marks statements of the qualifying examination as in a(i) above, but can apply on the basis of their previous academic record. In such cases, eligibility will be assessed on whether the candidate has secured a first class (60% in aggregate) in the previous years /semesters, pending the final year/semester results of their qualifying examination. They should have taken their final year qualifying examination before the date of joining the institute.

b) Candidates are selected for admission on the basis of their performance in an Admission Test followed by an interview.

c) On being selected for admission, each candidate will have to be found medically fit by the Institute's Medical Officer on Medical Examination.

d) Admission to M.Tech. Programme stands confirmed subject to candidates satisfying Regulation-2a(i) above, Medically found fit, submission of original marks statement of all the examinations, degree certificate and other certificates as required by the Institute, within one month from the date of Admission, failing which his/her admission stands cancelled.

SCHEME OF INSTRUCTION

REGULATION - 3: COURSE STRUCTURE

A) ACADEMICS:

The course structure of M.Tech. Programme will consist of the following:

a) **Core Courses**: There will be 6 Core Courses in the first two semesters.

b) **Elective Courses**: There will be 4 Elective Courses in the three Semesters.

c) **Project Work, Review and Viva Voce**: There will be a project with a total of 18 credits commencing in the third semester and spreading across 2 semesters for a total of 200 marks. The evaluation of the project work will be based on three components. Firstly there will be an interim project review component of 50 marks at the end of 3rd semester, project viva voce component having 50 marks at the end of 4th Semester and an internal-external double evaluation component of the project report/thesis for 100 marks.

d) **Viva voce**: There will be a Viva voce at the end of the I & II Semesters to test the subject knowledge. It is of internal evaluation assigned with 1 credit.

e) **Seminars:** The M.Tech. programme will have four seminars in total of which two seminars each in I and II Semesters. It is of internal evaluation assigned with 1 credit each. Seminar-I & III will be on study of Research Papers published in journals. Seminar-II & IV will be based on happenings and latest technology trends in the area of Computer Science.

f) **Comprehensive Viva voce**: There will be a Comprehensive Viva voce at the end of the IV Semester to test the subject knowledge. It is of internal evaluation assigned with 2 credits.

Note: Details of the papers Semester-wise with Scheme of Evaluation are given in **Annexure-4**.

B) INTEGRAL ITEMS:

The structure of Integral Items would be as follows:

1. Participation in Yogasanas, Games and Sports

2. Participation in Morning Prayer and Meditation Sessions

3. Attendance at Universal Prayer and Readings on Unity of Religions

4. Attendance at Classes

5. Participation in Social Work / Self-Reliance Programme

Note-1: The 'Integral Items' referring to the above co-curricular activities that form part of the Sri Sathya Sai Values-Based Integral Education System, would complement the academics component, catering to the physical, mental, intellectual, psychological and spiritual domains for holistic development of students personality.

Note-2: All the five Integral Items are applicable in each of the four semesters.

REGULATION - 4: CREDIT RATING OF M.Tech. COURSE

Each course carries a credit value relating to the weekly work-load for each semester. One credit is assigned to one lecture hour per week for the theory component of the course throughout a semester. For the Practical component of the course, one credit is assigned minimum of 2 and maximum of three periods per week throughout the semester.

The total credits for the various subjects and maximum marks for them from the first to the four semesters will be 70 and 1800 respectively.

Note: One laboratory credit is a minimum of two hours of laboratory work per week.

SCHEME OF EVALUATION

REGULATION - 5: EVALUATION MODES AND THEIR RELATIVE WEIGHTAGES:

The Evaluation Scheme will have two modes viz., one, **Continuous Internal Evaluation (CIE)** across the semester and two, **End Semester Examinations (ESE)**, at the end of the semester and, the students are graded, combining the marks in CIE and ESE on the weightage distribution shown below:

1st June, 2016

WEIGHTAGE DISTRIBUTION CIE(I) : ESE(E) GRADING

Programme	Semester	CIE Weightage (I)	ESE Weightage (E)
M.Tech.(Computer Science) Programme	I, II, III and IV	50%	50%

REGULATION – 6: CONTINUOUS INTERNAL EVALUATION (CIE)

A) ACADEMICS:

A-I) Theory Papers/ Courses:

CIE Scheme for Theory papers/courses will consist of various components such as slip test, assignment, quiz, oral test, seminar, viva voce, case study, surprise test, etc., to be conducted by the faculty members teaching the papers/courses.

Note: **The exact components of CIE** applicable to each course/paper will be notified from time to time by each department.

A-II) Practical papers/courses (Laboratory work):

There will be only **Continuous Internal Evaluation** of the performance of the students in **Practical papers/courses and Laboratory work**, to be evaluated by the faculty members teaching the same, under series of Evaluation **(SE)** consisting of various tests, experiments, records, viva, etc. across the semester.

Note: **CIE Scheme as applicable** from time to time for Theory and Practical papers/courses are given in Annexure-2.

B) INTEGRAL ITEMS:

All the five Integral Items are evaluated under CIE, as per the 'Guidelines for Evaluation of Integral Items' given in Annexure-3.

REGULATION - 7: END SEMESTER EXAMINATION (ESE)

a) There will be an end-semester examination (ESE) at the end of each semester.

b) The End Semester Examination question-papers will be set and evaluation done by External Examiners or by the faculty members of the Institute.

c) There will be double-valuation normally one internal and the other is external examiner, or both internal or both external depending on the circumstances, except for the papers designated as 'I'.

1st June, 2016

Note-1: Question papers for the papers carrying 3 credits and above, are to be set for 100 marks and for a duration of 3 hours, and, the papers of 1 or 2 credits are to be set for 50 marks and 1½ hours duration.

Note-2: The Scheme of Instruction and Evaluation, semester-wise consisting various details relating to paper code, title of the papers, credits, mode of evaluation, etc. for all Postgraduate programmes are given in Annexures–4.

REGULATION - 8: PROJECT and VIVA VOCE

a) Every student of the M.Tech. programme will have to choose a "Project" during the second semester and has to submit a Project Report, in triplicate, to the Institute at the end of the **fourth** semester, but not later than 5th of March of the following year. If a student fails to submit the Project Report on or before March 5th, however, submits **before 20th of March, a penalty of 5% marks (20 Marks) will be imposed mandatorily**. If a student fails to submit the Report even **by 20th of March** or declared failed on evaluation of Project Report, he will be asked to redo the Project work along with the next batch of students.

b) Student has to prefer, within a month after the commencement of the Third Semester, an application which should be accompanied by a synopsis prepared by the student.

c) It should be recommended by the teacher-guide and approved by the Head of the Department or by an external expert.

d) The evaluation of the Project will be normally done by one external examiner and one internal examiner who is normally the teacher-guide.

e) **Project Viva Voce:** There will be a Viva voce after the submission of the Project Report in 4th semester, scheduled between the last week of March and first week of April. A total of 50 Marks is earmarked for the same.

f) **Project Work, Interim Review and Viva voce**: The total number of credits for the project work will be 18 credits commencing in the third semester and spread across 2 semesters for a total of 200 marks. The evaluation of the project work will be based on three components.

    a. Firstly there will be an interim project review component based on a written report for a total of 50 marks at the end of 3rd semester which will be carried forward to 4th semester,

    b. Secondly, there will be an internal-external double evaluation component of 100 marks based on the submission of a formal project report/thesis.

    c. Finally, there will be a project Viva voce component having 50 marks at the end of 4th Semester and this will be scheduled within two weeks after the submission of the project reports.

g) The Viva voce Board for the evaluation of the theoretical knowledge at the end of 1st, 2nd and 4th semesters would be constituted by the Head of the Department from among the members of the faculty, the Head of the Department being the Chairman of the Board.

h) There will be a Project Viva voce at the end of Fourth Semester.

The Project Viva voce Board will be constituted as follows:

    i)   Head of the Department - Chairman
    ii) One or two Senior Faculty Members
    iii) External Experts

REGULATION – 9A: REQUIREMENT OF MINIMUM CLASS ATTENDANCE IN ACADEMICS FOR BEING ELIGIBLE TO SIT FOR END SEMESTER EXAMINATIONS

a) i) A student has to put in a minimum of 85% Class Attendance in each course/paper of study.

   ii) Attendance here denotes the actual number of days that a student has attended the class.

   iii) Attendance is calculated from the commencement of the Semester to 10 days before the last working day (prior to the commencement of study-leave), giving the benefit of attendance for the last ten days of the Semester.

b) A student, not allowed to take the End-Semester Examination for want of class-attendance, will not be permitted to move to the next Semester. However, he/she would be permitted to repeat the term in the course/paper and sit for Examination after registering the required attendance during the next academic year.

c) Condonation of Shortage of Class Attendance

"Notwithstanding what is stated above, the Vice-Chancellor may, in extraordinary cases, consider condonation of shortfall in class attendance on the basis of merits of each case".

Note: 'Repeating the term' means:-

i)   The marks obtained hitherto in CIE in the failed paper stands cancelled and the student has to take the CIE test afresh.

ii)   Whenever there is a change in the syllabus arising out of a new Scheme or otherwise the student may be asked to 'repeat' in the equivalent paper(s).

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REGULATION – 9B: OPTIMAL NUMERIC POINT (ONP) REQUIREMENT IN INTEGRAL ITEMS FOR BEING ELIGIBLE TO SIT FOR END SEMESTER EXAMINATIONS:

a) i) A student is required to earn 'Optimal Numeric Point' (ONP), as prescribed hereunder against each of the Integral Items:

Integral Items	ONP
1. Participation in Yogasanas, Games and Sports	7
2. Participation in Morning Prayer and Meditation Sessions	7
3. Attendance at Universal Prayer and Readings on Unity of Religions	9
4. Attendance at Classes	9
5. Participation in Social Work / Self-Reliance Programme	7

ii) Numeric Points in Integral Items are computed as given in 'Guidelines for Evaluation of Integral Items' (Annexure-3) which will be reckoned 10 days before the last working day (prior to the commencement of study-leave) of the semester.

b) A student not allowed to take End Semester Examinations for want of ONP in one or more of the Integral Items, will not be permitted to continue his/her studies further in the Institute.

c) Condonation of Shortfall of ONP in Integral Items:

"Notwithstanding what is stated above, the Vice-Chancellor may, in extraordinary cases, consider condonation of shortfall in ONP, on the basis of merits of each case".

REGULATION - 10:

Students will not be allowed to keep terms simultaneously for two different courses of study.

GRADING SYSTEM

REGULATION - 11: TEN-POINT SCALE GRADING

A) **ACADEMICS**:

i) The student's placement in the Ten-Point Scale Grading will reflect his/her cumulative academics performance during the two years of Postgraduate study.

ii) The **Cumulative Grade** will be awarded on the aggregate of the Combined Numeric Points in the papers during the four Semesters of the Postgraduate study.

B) **INTEGRAL ITEMS**:

Cumulative Grade will be awarded for the Integral Items in the Ten-Point Scale Grading on the aggregate of Numeric Points (NP) of all the Integral Items during the four semesters of Postgraduate study.

The **Integral Items** are:

1. Participation in Yogasanas, Games and Sports

2. Participation in Morning Prayer and Meditation Sessions

3. Attendance at Universal Prayer and Readings on Unity of Religions

4. Attendance at Classes

5. Participation in Social Work / Self-Reliance Programme

Note: i) Exemption from participation in the Integral Items may be given on valid medical grounds.

ii) Students who have been permitted to stay outside the Hostel are exempted from Yogasanas and attendance at the Morning Prayer and Meditation Sessions.

iii) Students should earn a minimum Numeric Point (NP) of **'4' for a Pass** in each of the Integral Items.

iv) Evaluation Scheme for Integral Items is given in Annexure-3.

REGULATION - 12: CLASSIFICATION AND CONVERSION

A) The following are the **Conversion Tables** for converting Marks into Numeric Points (NP), Grade Point Average (GPA) / Cumulative Grade Point Average (CGPA) into Letter Grades (LG) and its Qualitative Assessment (QA), for Academics as well as Integral Items:

12A-i) For converting Marks into Numeric Points (NP)

Conversion Table I-A:

Marks (%)	Numeric Point (NP)
Less than 50	FAILS
50 – 54	5
55 – 64	6
65 – 74	7
75 – 84	8
85 – 94	9
95 – 99	9.5
100	10

12A-ii) For converting GPA/CGPA into Letter Grades (LG) and its Qualitative Assessment (QA)

Conversion Table II-A

For M.Tech.(Computer Science) Programme

GPA/CGPA Range	Letter Grade (LG)	Qualitative Assessment (QA)
4.0 - 4.9	C	Average
5.0 - 5.9	B	Fair
6.0 - 6.9	A	Good
7.0 - 7.9	A+	Very Good
8.0 - 8.9	O	Distinction
9.0 – 10.0	O+	Outstanding

Note: Conversion Tables are to be read in tandem with other relevant clauses of Regulations such as 'Passing Minimum', etc.

12B   ACADEMICS:

12B-i)   Calculation of GPA / CGPA: ACADEMICS:

i-1) Credit (CR): A single credit for a paper represents a lecture of one hour per week or a laboratory / workshop period of 2 / 3 hours per week.

i-2) Combined Numeric Points (COMB-NP): The Combined Marks of a student for a paper shall be computed as the weighted average of the Continuous Internal Evaluation (CIE) Marks and the End Semester Examination (ESE) Marks, based on the prescribed weightage ratio. The Combined Marks is then converted to the Combined Numeric Points based on Conversion Table I-A.

i-3) Grade Point Average (GPA) of a student in a Semester: The GPA of a student in a semester shall be computed as follows:

a) In a set of papers for a given Semester, the Credit(s) of each paper is multiplied by the corresponding Combined Numeric Points (COMB-NP).

b) "Combined Numeric Points" for all the papers in a given Semester are totalled to give the Total "Combined Numeric Points".

c) GPA is computed by dividing the Total "Combined Numeric Points" by the total of Credits of all papers completed in the Semester.

i-4) Grade of a student in a Semester: The Grade of a student in a Semester shall be awarded with reference to the Conversion Table II-A for the GPA obtained by the student.

i-5) Cumulative Grade Point Average (CGPA) and Cumulative Grade of a student in a Programme: The Cumulative Grade Point Average (CGPA) and Cumulative Grade of a student in a Programme shall be computed/awarded in the same way as the Grade Point Average (GPA) and Semester Grade respectively.

12C   INTEGRAL ITEMS:

12C-i)   Calculation of CGPA:

a) **Grade Points for Integral Items** shall be awarded in the form of Numeric Points (NP), as in the case of Academics (Conversion Table-IA); and the alphabet "X" represents "Exemption" in the concerned Integral Item.

b) **Cumulative Grade Point Average (CGPA) of a student in Integral Items** shall be computed by dividing the total of Numeric Points (NP) awarded, by the number of Integral Items taken into account, leaving those with grade "X" (exemption), if any, for the entire Programme.

c) **Cumulative Grade of a student in Integral Items** shall be awarded with reference to the Conversion Table II-A.

Note: Students should earn a minimum Numeric Point (NP) of **'4' for a Pass** in each of the Integral Items.

REGULATION - 13:   PASSING MINIMUM IN ACADEMICS

Passing Minimum: In a paper, a **Numeric Point of '5'** (a minimum of 50% marks) in the End Semester Examination **(ESE-NP)**; a **Combined Numeric Point of '5'** (a minimum of 50% marks) **(COMB-NP)**; and a Minimum of **Grade 'B'** in a **Semester**.

REGULATION - 14:   GRADE CARDS

a)   A Grade-Card will be issued at the end of each Semester.

b)   The Grade-Cards shall contain three separate entries, one for the Numeric points of Continuous Internal Evaluation (CIE-NP), second for

the Numeric Point of End-Semester Examination (ESE-NP) and the third for Combined Numeric Point (COMB-NP).

c) The Grade Cards will also show separately the Numeric Points (NP) obtained by the students in each of the Integral Items.

Note: A consolidated grade card will be issued at the end of the Postgraduate programme, showing the Combined Numeric Point (COMB-NP) in each paper semester-wise, and, CGPA, CG in Academics as well as Integral Items.

PROMOTION AND AWARD OF DEGREES

REGULATION - 15: PROMOTION

A student should have passed in all the papers and obtained a minimum Grade 'B' for Promotion from one semester to next semester.

However, a student would be permitted to go from one semester to the next semester if he has not failed in more than two theory papers subject to his passing in both papers and getting a Grade 'B' for regularising the promotion.

REGULATION - 16: SUPPLEMENTARY EXAMINATION:

a) A student who fails or is absent in the End Semester Examinations, has to apply for permission in the prescribed application form to take 'Supplementary Examination'. Permission may be granted on the basis of the genuineness of the reason given in the application. The same holds good for the courses evaluated entirely under CIE or ESE (Mode of Evaluation 'I' or 'E').

b) A student is permitted to take 'Supplementary Examination' subject to the following:

   (i) He will not be eligible to take 'Supplementary Examination' in any single paper or subject more than once.

   (ii) If he fails in 'Supplementary Examination', he will be asked to repeat the semester or discontinue from the course.

c) Notwithstanding anything stated above, the Vice-Chancellor may, on the basis of the merits of each case, grant a student an extra chance by way of Supplementary examination in any paper.

Note: 'Repeating the term' means:-

i) The marks obtained hitherto in CIE in the failed paper stands cancelled and the student has to take the CIE tests afresh.

ii) Whenever there is a change in the Syllabus arising out of a new Scheme or otherwise the student may be asked to 'repeat' in the equivalent paper(s).

REGULATION - 17:   WITHDRAWAL FROM THE PROGRAMME

At the end of the semester the student will be asked to withdraw from the Programme in the following cases:

     i)   Failure in more than 2 Theory Papers in a semester

     ii)   Failure in the supplementary examination

REGULATION - 18:   AWARD OF DEGREES

A student of the M.Tech. course would be evaluated on the basis of his achievement during the three Semesters including the Project work and Viva voce.

REGULATIONS - 19:

Any Research Report, Dissertation, Tour Report and Project Report submitted by the students during the Course of study, will become the property of the Institute.

REGULATION - 20:

The Vice-Chancellor may use his discretion in terms of interpreting and/or modifying any of the above clauses to meet the changing requirements.

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INTEGRAL ITEMS

The 'Integral Items' referring to the co-curricular activities mentioned below that form part of the Sri Sathya Sai Values-Based Integral Education System, would complement the academics component, catering to the physical, mental, intellectual, psychological and spiritual domains for holistic development of students personality.

Each item carries 50 marks per Semester and the assessment is done for all the four Semesters for M.Tech.(Computer Science). The details of marks allotted for different Integral Items are given below:

	Integral Items	Per Semester	M.Tech.
1.	Yogasanas, Games and Sports	50	200
2.	Attendance at Morning Prayer and Meditation Sessions	50	200
3.	Attendance at Universal Prayer and Readings on 'Unity of Religions'	50	200
4.	Attendance at Classes	50	200
5.	Social Work / Self-Reliance Programme	50	200
		250	1000

Each student spends about 12 hours a month on Self-Reliance Programme or Social Work and 12 hours a month on Sports, Yogasanas and Games.

Detailed procedures are laid down for evaluating the performance of students in Social-Work and Self-Reliance Programme and other items.

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1st June, 2016

M.Tech.(Computer Science) PROGRAMME
CIE SCHEME

(APPLICABLE FROM JUNE 2011, CONCURRENTLY FOR ALL BATCHES viz., I, and II YEARS)

<u>I – THEORY Components of the PAPERS</u>
(CIE : ESE weightage = 50% : 50% for all departments)

Item	Marks Allotted	CIEs are scheduled as per the Academic Calendar
CIE- I	25	Written Test
CIE - II	25	Written test
CIE - III	25	Written Test
Assignment /Seminar	25	Across the semester
Total Marks	**100**	

<u>II – ALL PRACTICAL Components of the Papers</u>

SE	ST
50%	**50%** (Comprehensive Viva voce with a minimal Practical Test)

SE: A Series of Evaluation (SE) consisting of various tests, experiments, records, viva, etc. across the semester.

ST: A Summative Test (ST) at the close of the semester.

Note: However, CIE marks would be shown in the mark list submitted by the teacher concerned, as only one figure merging both, the Series of Evaluation (SE) and the Summative Test (ST) Marks in the ratio said above.

1st June, 2016

Note:

1) Only Continuous Internal Evaluation(CIE) for M.Tech. Practicals: There will be only Continuous Internal Evaluation (CIE) and no End Semester Examinations for all Practicals..

2) Components of CIE: Though CIE mode remains to be 100% for Practicals, two broad components form the entire CIE scheme, viz., One – SE: A Series of Evaluation(SE) consisting of various tests, experiments, records, viva, etc. across the semester and Two – ST: A Summative Test(ST) at the close of the semester. The ratio of these two components of CIE, viz., SE : ST as emerged in the meeting are as follows:

SE	ST
50%	50% (Practicals and a Comprehensive Viva voce)

Note: i) However, CIE marks would be shown as only one figure merging both, the Series of Evaluation (SE) and the Summative Test (ST) Marks in the ratio said above.

ii) Further, the weightage ratio of CIE components could be finally decided by each of the departments depending on their suitability, in case of PG programmes, and uniformity across the campuses is maintained.

3) Summative Test is mandatory: Summative Test is mandatory and it forms part of all CIE practicals. There will be two examiners, one, the teacher who taught the paper in the current semester and two, another suitable member of the department in the campus, or, from other campus, or a visiting faculty.

4) Maintenance of CIE Record: As a part of CIE, record of performance of the students, i.e., 'Record Sheet' would be maintained by the teacher concerned in the prescribed format. The format would indicate all the sub-components under each of the two Main Components, viz., SE and ST. The Record sheet, with all enclosures should be duly signed and submitted to HOD at the time of conduct of Summative Test. HOD will arrange for the scrutiny of the same by the examiners of Summative Test for certification.

5) Submission of Marklist:

5a) One Marks list for the Theory Component of each of the papers will be submitted to the Controller of Examinations at the end of the semester as a part of CIE. Teacher would submit a marks statement containing all the components of CIE as evaluated by him. The final figure will be included in the Marks list.

5b) One Marks list for the practical component for each of the papers (wherever applicable) will be submitted to the Controller of Examinations at the end of the semester as a part of CIE. Teacher would submit a marks statement containing all the components of CIE as evaluated by him. The final figure will be included in the Marks list.

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1st June, 2016

SRI SATHYA SAI INSTITUTE OF HIGHER LEARNING

(Deemed to be University)

Vidyagiri, **Prasanthi Nilayam** – 515 134

Anantapur District, Andhra Pradesh, India

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INTEGRAL ITEMS

Guidelines for Evaluation of Integral Items using Ten-Point Scale

Academic Year: _____   Semester No. _____

Consolidated Assessment Sheet – A

Integral Item-1: Participation in Yogasanas, Games and Sports

Sl. No.	Regd. No.	Components (Evaluate each component out of 10 marks)							Total Marks out of 70	Percentage = TM / 0.7	Numeric Point (NP) *	Remarks
		Punctuality	Learning of Skills	Practice of Skills	Fair Play	Discipline	Self-Control	Team Work				
		C1	C2	C3	C4	C5	C6	C7	TM			

Consolidated Assessment Sheet - B

Integral Item-5: Participation in Social Work / Self-Reliance Programme

Sl. No.	Regd. No.	Components (Evaluate each component Out of 10 marks)					Total Marks out of 50	Percentage = TM / 0.5	Numeric Point (NP) *	Remarks
		Punctuality	Regularity & Courtesy	Enthusiasm & Mastering Skills	Initiative, Willingness & Promptness in Serving	Efficiency & Quantum of Service				
		C1	C2	C3	C4	C5	TM			

Consolidated Assessment Sheet – C

Integral Item – 2: Participation in Morning Prayer and Meditation Sessions
Integral Item – 3: Attendance at Universal Prayer and Readings on Unity of Religions
Integral Item – 4: Attendance at the Classes

Sl.No.	Regd. No.	Integral Item - 2		Integral Item – 3		Integral Item - 4		Remarks
		%	Numeric Point (NP) *	%	Numeric Point (NP) *	%	Numeric Point (NP) *	

* Refer to Conversion table on the next page.

1st June, 2016

List of Integral Items: There are five Integral Items that are evaluated along with the academic curricula, as part of the evaluation system in the Institute. They are:

1. Participation in Yogasanas, Games and Sports
2. Participation in Morning Prayer and Meditation Sessions
3. Attendance at Universal Prayer and Readings on Unity of Religions
4. Attendance at Classes
5. Participation in Social Work / Self-Reliance Programme.

All Integral Items from 1 to 5 are evaluated on a percentage scale grading as per the 'Guidelines' in reference to the Consolidated Assessment Sheets A, B and C.
a) The Percentage Marks to Numeric Point (NP) conversion is given below in Table-I-A.
b) Passing Minimum in each of the Integral Items: '4' Numeric Point (NP)
c) Cumulative Grade Point Average (CGPA) of a student in Integral Items is computed by dividing the total of Numeric Points (NP) awarded, by the number of Integral Items taken into account, leaving those with grade "X" (exemption), if any, for the entire Programme.
d) Cumulative Grade of a student in Integral Items is awarded with reference to the Conversion Table II-A.

Table – I-A	
For Converting Percentage Marks to Numeric Point	
Marks (%)	**Numeric Point (NP)**
Less than 40	**FAILS**
40 – 44	4
45 – 54	5
55 – 64	6
65 – 74	7
75 – 84	8
85 – 94	9
95 – 99	9.5
100	10

Conversion Table – II-A		
For converting CGPA into Letter Grades (LG) and its Qualitative Assessment (QA)		
GPA/CGPA Range	**Letter Grade (LG)**	**Qualitative Assessment (QA)**
4.0 - 4.9	C	Average
5.0 - 5.9	B	Fair
6.0 - 6.9	A	Good
7.0 - 7.9	A+	Very Good
8.0 - 8.9	O	Distinction
9.0 – 10.0	O+	Outstanding

Optimal Numeric Point (ONP) Requirement in Integral Items

Integral Items	ONP
1. Participation in Yogasanas, Games and Sports	7
2. Participation in Morning Prayer and Meditation Sessions	7
3. Attendance at Universal Prayer and Readings on Unity of Religions	9
4. Attendance at Classes	9
5. Participation in Social Work / Self-Reliance Programme	7

Numeric Point awarded in each of the Integral Items for a candidate, in a semester, is indicated in her/his Grade Card.

1st June, 2016

M.Tech. (Computer Science) PROGRAMME

The curriculum for M.Tech.(Computer Science) will have the following course structure:

A. CURRICULUM AT A GLANCE.

	Number	Credits
Core Theory Courses	6	6 x 3 = 18
Core Practicals	5	5 x 2 = 10
Electives	4	4 x 4 = 16
Seminar	4	4 x 1 = 4
Viva voce	2	2 x 1 = 2
Comprehensive Viva voce	1	1 x 2 = 2
Project Work – Review	1	1 x 0 = 0
Project Work	1	1 x 18 = 18

TOTAL CREDITS : :::::::::::::::::::: 70

B. SEMESTER-WISE COURSE PROGRAMME FOR M.Tech.

Semester of study	Component	Number of Courses	Credits	Min.hrs/week
I	a) Core Theory courses	3	3x3 = 9	9
	b) Core Practical Courses	3	3x2 = 6	12
	c) Electives	1	4x1 = 4	4
	d) Seminars	2	2x1 = 2	-
	e) Viva voce	1	1x1 = 1	-
	f) Awareness Course	1	--	1
	Total	**10**	**22**	**26**
II	a) Core Theory courses	3	3x3 = 9	9
	b) Core Practical Courses	2	2x2 = 4	8
	c) Electives	2	4x2 = 8	8
	d) Seminars	2	2x1 = 2	-
	e) Viva voce	1	1x1 = 1	-
	f) Awareness Course	1	--	1
	Total	**11**	**24**	**26**
III	a) Electives	1	4x1 = 4	4
	b) Project Work – Review	-		22
	Total	**2**	**4**	**26**

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Semester of study	Component	Number of Courses	Credits	Min.hrs/week
IV	a) Project work	1	18x1 = 18	24
	b) Project Viva voce	1	-	-
	c) Comprehensive Viva voce	1	1x 2 = 2	-
	Total	**3**	**20**	**24**
	GRAND TOTAL		**70**	**102**

C. Definition and Explanation of terms.

Core Courses:

These are basic subject areas and every student must study these courses.

Electives:

A student, in a semester, can make a choice from the courses that are being offered in that semester. These cover specialized/advanced topics. A student may choose courses from the list of electives included with the course curriculum. The number of electives run in a given semester will be decided by the department based on the students' request and available resources.

Seminar and Viva voce:

Seminars will be conducted during the Semester, where articles appearing in advanced journals of Computer Science will be presented. Viva voce will be conducted at the end of the Semester. The Viva voce board will be constituted by the Head of the department comprising of some senior faculty members of the department. Viva voce board will examine students' comprehension of the courses undergone and knowledge of general nature. The two components (Seminar and Viva voce) will have equal weightage for the grading purpose.

Project Interim Review:

There will be Project Interim Review at the end of third semester where every student shall submit a Project Interim Review on the Project Work indicating the progress made (the report to include progress of the project, Literature review etc.).

Project:

It could be any one of the following.

> * Design and development of new software tools or packages,
> * Original theoretical research,
> * A substantial critical survey of any current topic,
> * A combination of the above.

Project Viva voce:

It will be conducted at the end of the third Semester by a board constituted by the HOD. It will examine students' knowledge, comprehension and application abilities in general and as applied to the project in particular.

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D. TYPICAL SEMESTER-WISE COURSE SCHEDULE

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE
SCHEME OF INSTRUCTION AND EVALUATION
M.Tech.(Computer Science)

(Effective from the batch 2016-17 onwards)

Paper Code	Title of the Paper	Credits	Hours	Types of Papers	Modes of Evaluation	Maximum Marks
FIRST SEMESTER						
MTCS-101(T)	Design and Analysis of Algorithms	3	3	T	IE2	100
MTCS-101(P)	Practicals: Design and Analysis of Algorithms	2	4	P	I	50
MTCS-102(T)	Advanced Computer Architecture	3	3	T	IE2	100
MTCS-102(P)	Practicals: Advanced Computer Architecture	2	4	P	I	50
MTCS-103(T)	Parallel Processing	3	3	T	IE2	100
MTCS-103(P)	Practicals: Parallel Processing	2	4	P	I	50
MTCS-104	Elective-I	4*	4*	T	IE2	100*
MTCS-105	Seminar-I	1	-	-	I	50
MTCS-106	Seminar-II	1	-	-	I	50
MTCS-107	Semester End Viva voce	1	-	SEV	E1	50
SAWR-100N	Awareness Course-I: Education for Life – Individual Transformation	**Non-Credit**	1	I	-	--
		---- 22	26			------ 700
SECOND SEMESTER						
MTCS-201	Theory of Computation	3	3	T	IE2	100
MTCS-202(T)	Distributed Systems	3	3	T	IE2	100
MTCS-202(P)	Practicals: Distributed Systems	2	4	P	I	50
MTCS-203(T)	Topics in Database Management Systems	3	3	T	IE2	100
MTCS-203(P)	Practicals: Topics in Database Management Systems	2	4	P	I	50
MTCS-204	Elective-II	4*	4*	T	IE2	100*
MTCS-205	Elective-III	4*	4*	T	IE2	100*
MTCS-206	Seminar-III	1	-	-	I	50
MTCS-207	Seminar-IV	1	-	-	I	50
MTCS-208	Semester End Viva voce	1	-	SEV	E1	50
SAWR-200N	Awareness Course-II: God, Society and Man	**Non-Credit**	1	I	-	--
		---- 24*	26*			------ 750
THIRD SEMESTER						
MTCS-301	Elective-IV	4*	4*	T	IE2	100*
MTCS-401	Project Work – Review	-	22	PW	-	50**
		---- 4	26*			------ 100
FOURTH SEMESTER						
MTCS-401	Project Work	18	24	PW	E2	150***
MTCS-402	Comprehensive Viva voce	2	-	COV	E1	50
		---- 20	24			------ 250
	TOTAL:	**70**	**102***			**1800***

PS: Please refer to guidelines for 'Modes of Evaluation for various types of papers', and 'Viva voce nomenclature & scope and constitution of the Viva voce Boards'.

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*   Credits split between Lectures and Practical, total marks for the subject, and the grand total marks for the paper, may change based on the credits allocated for the Lecture and Practicals of the elective(s) the students opt for. i.e., the elective paper A may be designed to have two different components/mode of delivery namely, Theory and Practical with clear division of credits among the components. For example a 4 credit course could be specified as 2L+2P to indicate 2 credits for lectures and 2 credits for practical or as 3L+P meaning 3 credits for lecture and one credit for practical or L+3P to indicate 1 credit for lectures and 3 credits for practical, .

**   The Project Work topic would be finalized by the end of the second semester, and the Project Work starts in the third semester and gets completed in the fourth semester. Then interim review would consist of an oral examination to assess the progress made by the student in the project work. Student will be asked to make a presentation along with a submission of report of work done so far.

***   Total marks for the Project Work would be for **200 marks**, which would include
   - **50 marks** for the review of the project work by the student at the end of the third semester (please see **)
   - **100 marks** for the Project Report Examination
   - **50 marks** for Project Viva voce conducted at the end of the 4th semester.

Continuous Internal Evaluation (CIE) & End Semester Examination (ESE)

Indicator	Legend
IE1	CIE and ESE ; ESE single evaluation
IE2	CIE and ESE ; ESE double evaluation
I	Continuous Internal Evaluation **(CIE)** only Note: 'I' does not connote 'Internal Examiner'
E	End Semester Examination **(ESE)** only Note: 'E' does not connote 'External Examiner'
E1	ESE single evaluation
E2	ESE double evaluation

STREAMS of Elective Courses

STREAM I: INTELLIGENT SYSTEMS AND KNOWLEDGE ENGINEERING

Paper Code	Elective Title	Credits	Prerequisite
ISKE 1(T)	Artificial Intelligence	3	--
ISKE 1(P)	Practicals: Artificial Intelligence	1	

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Paper Code	Elective Title	Credits	Prerequisite
ISKE 2(T)	Genetic Algorithms	3	--
ISKE 2(P)	Genetic Algorithms	1	
ISKE 3(T)	Natural Language Processing	3	First level Course in A.I
ISKE 3(P)	Practicals: Natural Language Processing	1	First level Course in A.I
ISKE 4(T)	Neural Networks	3	--
ISKE 4(P)	Practicals: Neural Networks	1	--
ISKE 5(T)	Data Mining and Data Warehousing	3	First level course in Databases
ISKE 5(P)	Practicals: Data Mining and Data Warehousing	1	First level course in Databases
ISKE 6(T)	Pattern Recognition	3	Foundations in Probability and Statistics.
ISKE 6(P)	Practicals: Pattern Recognition	1	Foundations in Probability and Statistics.
ISKE 7(T)	Machine Learning	3	Foundations in Probability and Statistics.
ISKE 7(P)	Practicals: Machine Learning	1	Foundations in Probability and Statistics.
ISKE 8(T)	Mining of Big Data Sets	2	--
ISKE 8(P)	Practicals: Mining of Big Data Sets	2	--

STREAM II: ADVANCED COMPUTER NETWORKS

Paper Code	Elective Title	Credits	Prerequisite
ACN 1(T)	Telecom Networking	3	First level Course in Computer Networks
ACN 1(P)	Practicals: Telecom Networking	1	First level Course in Computer Networks
ACN 2(T)	Network Security	3	First level Course in Computer Networks
ACN 2(P)	Practicals: Network Security	1	
ACN 3(T)	Wireless and Mobile Networks	3	First level Course in Computer Networks
ACN 3(P)	Practicals: Wireless and Mobile Networks	1	First level Course in Computer Networks
ACN 4(T)	Advanced Computer Networks	3	First level Course in Computer Networks

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ACN 4(P)	Practicals: Advanced Computer Networks	1	First level Course in Computer Networks

STREAM III: HUMAN COMPUTER INTERACTION

Paper Code	Elective Title	Credits	Prerequisite
HCI 1(T)	Digital Image Processing	3	--
HCI 1(P)	Practicals: Digital Image Processing	1	
HCI 2(T)	Medical Image Processing	3	First level Course in Image Processing
HCI 2(P)	Practicals: Medical Image Processing	1	First level Course in Image Processing
HCI 3(T)	Computer vision	3	First level Course in Image Processing
HCI 3(P)	Practicals: Computer vision	1	First level Course in Image Processing
HCI 4(T)	Advanced Topics in Image Processing	3	First level Course in Image Processing
HCI 4(P)	Practicals: Advanced Topics in Image Processing	1	First level Course in Image Processing
HCI 5(T)	Video Processing	3	First level Course in Image Processing
HCI 5(P)	Practicals: Video Processing	1	First level Course in Image Processing

STREAM IV: THEORETICAL COMPUTER SCIENCE

Paper Code	Elective Title	Credits	Prerequisite
TCS 1(T)	Advanced Algorithms	3	First level Course in Algorithms, Probability.
TCS 1(P)	Practicals: Advanced Algorithms	1	First level Course in Algorithms, Probability.
TCS 2(T)	Cryptography	3	--
TCS 2(P)	Practicals: Cryptography	1	--

STREAM V: COMPUTER SYSTEMS

Paper Code	Elective Title	Credits	Prerequisite
CS 1(T)	Compiler Design	3	
CS 1(P)	Practicals: Compiler Design	1	
CS 2(T)	Embedded Computing	3	First course in Architecture, OS
CS 2(P)	Practicals: Embedded Computing	1	First course in Architecture, OS
CS 3(T)	Advanced Programming in Unix Environment	2	
CS 3(P)	Practicals: Advanced Programming in Unix Environment	2	
CS 4(T)	Programming for performance	2	First course in Architecture
CS 4(P)	Practicals: Programming for Performance	2	First course in Architecture
CS 5(T)	Operating Systems	3	
CS 5(P)	Practicals: Operating Systems	1	

STREAM VI: MULTI-CORE AND PARALLEL COMPUTING

Paper Code	Elective Title	Credits	Prerequisite
MPC 1(T)	Parallel Numerical Linear Algebra	3	First level Course in Architecture, Algorithms, Numerical Linear Algebra
MPC 1(P)	Practicals: Parallel Numerical Linear Algebra	1	First level Course in Architecture, Algorithms, Numerical Linear Algebra
MPC 2(T)	Multi core Computing	3	First level Course in Architecture, Algorithms
MPC 2(P)	Practicals: Multi core Computing	1	First level Course in Architecture,

			Algorithms
MPC 3(T)	High Performance Embedded Computing	3	First level Course in Architecture, Algorithms, Operating Systems
MPC 3(P)	Practicals: High Performance Embedded Computing	1	First level Course in Architecture, Algorithms, Operating Systems
MPC 4(T)	High Performance Computing with Accelerators	2	First Level course in Architecture, Systems Programming
MPC 4(P)	Practicals: High Performance Computing with Accelerators	2	First Level course in Architecture, Systems Programming
MPC 5(T)	Cloud Computing	2	First Level course in Architecture, Systems Programming
MPC 5(P)	Practicals: Cloud Computing	2	First Level course in Architecture, Systems Programming
MPC 6(T)	Multi Processor Programming	2	First Level course in Architecture, Systems Programming
MPC 6(P)	Practicals: Multi Processor Programming	2	First Level course in Architecture, Systems Programming

STREAM VII: SOFTWARE ENGINEERING

Paper Code	Elective Title	Credits	Prerequisite
SE 1(T)	Object Oriented System Design	3	--
SE 1(P)	Practicals: Object Oriented System Design	1	--
SE 2(L)	Web Technology	3	--
SE 2(P)	Practicals: Web Technology	1	--

STREAM VIII: MATHEMATICAL METHODS IN COMPUTER SCIENCE

Paper Code	Elective Title	Credits	Prerequisite
MMCS 1(T)	Mathematical Methods in Image Processing	3	First level course in PDE and Calculus of Variations
MMCS 1(P)	Practicals: Mathematical	1	First level course in PDE

	Methods in Image Processing		and Calculus of Variations
MMCS 2(T)	Numerical Methods in Image Processing	3	First level course in Calculus of Variations
MMCS 2(P)	Practicals: Numerical Methods in Image Processing	1	First level course in Calculus of Variations
MMCS 3(T)	Mathematical Methods for Data Mining	3	First level courses in Probability and Linear Algebra
MMCS 3(P)	Practicals: Mathematical Methods for Data Mining	1	First level courses in Probability and Linear Algebra

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