

**GITAM INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(GITAM)
(Deemed to be University, Estd. u/s 3 of UGC Act 1956)
VISAKHAPATNAM *HYDERABAD *BENGALURU
Accredited by NAAC with 'A' Grade**



REGULATIONS AND SYLLABUS

of

**Master of Science in Data Science
(M.Sc Data Science)**

(W.e.f 2017-18 admitted batch)

Website: www.gitam.edu

Master of Science in Data Science (M.Sc Data Science)
REGULATIONS
(W.e.f. 2017-18 admitted batch)

1. ADMISSION

1.1 Admission into M.Sc Data Science program of GITAM University is governed by GITAM University admission regulations.

2. ELIGIBILITY CRITERIA

2.1. A pass in BCA or B.Sc degree with a minimum aggregate of 50% marks / a pass in any degree with minimum aggregate of 50% marks along with Mathematics or Statistics or Computer science as one of the subject.

2.2. Admission into M.Sc Data Science (Master of Science in Data Science) will be based on an All India GITAM Science Admission Test (GSAT) conducted by GITAM University and the rule of reservation, wherever applicable.

3. CHOICE BASED CREDIT SYSTEM

Choice Based Credit System (CBCS) is introduced with effect from the admitted Batch of 2015-16 based on UGC guidelines in order to promote:

- Student Centered Learning
- Cafeteria approach
- Inter-disciplinary learning

Learning goals/ objectives and outcomes are specified leading to what a student should be able to do at the end of the program.

4. STRUCTURE OF THE PROGRAM:

4.1 The Program Consists of

- i) Foundation Courses (compulsory) which give general exposure to a Student in communication and subject related area.
- ii) Core Courses (compulsory).
- iii) Discipline centric electives which
 - a) are supportive to the discipline
 - b) give expanded scope of the subject
 - c) give inter disciplinary exposure
 - d) nurture the student skills
- iv) Open electives are of general nature either related or unrelated to the discipline.
- v) Practical Proficiency Courses
Laboratory and Project work.

4.2 Each course is assigned a certain number of credits depending upon the number of contact hours (lectures/tutorials/practical) per week.

4.3 In general, credits are assigned to the courses based on the following contact hours per week per semester.

- One credit for each Lecture / Tutorial hour per week.
- Two credits for three hours of Practicals per week.
- Eight credits for project.

4.4 The curriculum of the Four semesters M.Sc Data Science program is designed to have a total of 84 credits for the award of M.Sc Data Science degree.

5. MEDIUM OF INSTRUCTION

The medium of instruction (including examinations and project reports) shall be in English.

6. REGISTRATION

Every student has to register himself / herself for each semester individually at the time specified by the Institute / University.

7. ATTENDANCE REQUIREMENTS

7.1 A student whose attendance is less than 75% in all the courses put together in any semester will not be permitted to attend that end - semester examination and he/she will not be allowed to register for subsequent semester of study. He/she has to repeat the semester along with his / her juniors.

7.2 However, the Vice Chancellor on the recommendation of the Principal / Director of the Institute/School may condone the shortage of attendance to the students whose attendance is between 66% and 74% on genuine grounds and on payment of prescribed fee.

8. EVALUATION

8.1 The assessment of the student's performance in a Theory course shall be based on two components: Continuous Evaluation (40 marks) and Semester-end examination (60 marks).

8.2 A student has to secure an aggregate of 40% in the course in continuous and semester end examinations the two components put together to be declared to have passed the course, subject to the condition that the candidate must have secured a minimum of 24 marks (i.e. 40%) in the theory component at the semester-end examination.

8.3 Practical / Viva voce etc. course are completely assessed under Continuous Evaluation for a maximum of 100 marks and a student has to obtain a minimum of 40% to secure Pass Grade. Details of Assessment Procedure are furnished below in Table 1.

Table 1: Assessment Procedure

S. No.	Component of assessment	Marks allotted	Type of Assessment	Scheme of Examination
1	Theory	40	Continuous evaluation	(i) Two mid semester examinations shall be conducted for 15 marks each. (ii) 5 marks are allocated for quiz. (iii) 5 marks are allocated for assignments.
		60	Semester-end examination	The semester-end examination Shall be for a maximum of 60 marks.
	Total	100		
2	Practicals	40	Continuous evaluation	Forty (40) marks for continuous evaluation is distributed among the components: regularity, preparation for the practical, performance, submission of records and oral presentations in the laboratory. Weightage for each component shall be announced at the beginning of the Semester.
		60	Continuous evaluation	Sixty (60) marks for two tests of 30 marks each (one at the mid-term and the other towards the end of the Semester) conducted by the concerned lab Teacher and another faculty member of the department who is not connected to the lab, as appointed by the HoD.
	Total	100		
3	Project work	200	Project evaluation	(i) 150 marks for evaluation of the project work dissertation submitted by the candidate. (ii) 50 marks are allocated for the project Viva-Voce. (iii) The project work evaluation and the Viva-Voce shall be conducted by one external examiner outside the University and the internal project work supervisor.

9. REAPPEARANCE

- 9.1 A student who has secured 'F' grade in a Theory course shall have to reappear at the subsequent semester end examinations held for that course.
- 9.2 A student who has secured 'F' grade in a Practical course shall have to attend Special Instruction Classes held during summer.
- 9.3 A student who has secured 'F' Grade in Project work / Industrial Training etc shall have to improve his/her report and reappear for Viva – voce at the time of Special Examination to be conducted in the summer vacation.

10. SPECIAL EXAMINATION

A student who has completed his / her period of study and still has “F” grade in a maximum of three Theory courses is eligible to appear for Special Examination normally held during summer vacation.

11. BETTERMENT OF GRADES

A student who has secured only a Pass or Second class and desires to improve his/her Class can appear for Betterment Examinations only in Theory courses of any Semester of his/her choice, conducted in Summer Vacation along with the Special Examinations. Betterment of Grades is permitted ‘only once’ immediately after completion of the program of study.

12. GRADING SYSTEM

12.1 Based on the student performance during a given semester, a final letter grade will be awarded at the end of the semester in each course. The letter grades and the corresponding grade points are as given in Table 2.

Table 2: Grades & Grade Points

Sl.No.	Grade	Grade Points	Absolute Marks
1	O (outstanding)	10	90 and above
2	A+ (Excellent)	9	80 to 89
3	A (Very Good)	8	70 to 79
4	B+ (Good)	7	60 to 69
5	B (Above Average)	6	50 to 59
6	C (Average)	5	45 to 49
7	P (Pass)	4	40 to 44
8	F (Fail)	0	Less than 40
9	Ab. (Absent)	0	-

12.2 A student who earns a minimum of 4 grade points (P grade) in a course is declared to have successfully completed the course, and is deemed to have earned the credits assigned to that course, subject to securing a GPA of 5 for a Pass in the semester.

13. GRADE POINT AVERAGE

13.1 A Grade Point Average (GPA) for the semester will be calculated according to the formula:

$$\text{GPA} = \frac{\Sigma [C * G]}{\Sigma C}$$

Where

C = number of credits for the course,

G = grade points obtained by the student in the course.

13.2 To arrive at Cumulative Grade Point Average (CGPA), a similar formula is used considering the student’s performance in all the courses taken, in all the semesters up to

the particular point of time.

- 13.3 CGPA required for classification of class after the successful completion of the program is shown in Table 3.

Table 3: CGPA required for award of Class

Class	CGPA Required
First Class with Distinction	$\geq 8.0^*$
First Class	≥ 6.5
Second Class	≥ 5.5
Pass Class	≥ 5.0

* In addition to the required CGPA of 8.0 or more the student must have necessarily passed all the courses of every semester in first attempt.

14. ELIGIBILITY FOR AWARD OF THE M.Sc Data Science DEGREE

- 14.1 Duration of the program: A student is ordinarily expected to complete M.Sc Data Science program in four semesters of two years. However a student may complete the program in not more than four years including study period.
- 14.2 However the above regulation may be relaxed by the Vice Chancellor in individual cases for cogent and sufficient reasons.
- 14.3 A student shall be eligible for award of the M.Sc Data Science Degree if he / she fulfills all the following conditions.
- Registered and successfully completed all the courses and projects.
 - Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of his/her study within the stipulated time.
 - Has no dues to the Institute, hostels, Libraries, NCC / NSS etc, and
 - No disciplinary action is pending against him / her.
- 14.4 The degree shall be awarded after approval by the Academic Council.

15. Discretionary Power:

Not with standing anything contained in the above sections, the Vice Chancellor may review all exceptional cases, and give his decision, which will be final and binding.

**M.Sc Data Science - Scheme of Instruction
I SEMESTER**

Sl. No.	Course Code	Name of the Course	Credits	Scheme of Instruction		Total	Scheme of Examination		
				Hours per Week			Duration in Hrs.	Maximum Marks	
				L/T	P			Sem. End Exam	Con. Eval
1	SDS 701	Web Programming	4	4	0	4	3	60	40
2	SDS 703	Introduction to Python Programming	4	4	0	4	3	60	40
3	SDS 705	Statistics - I	4	4	0	4	3	60	40
4	SDS 707	Mathematics for Data Science	4	4	0	4	3	60	40
5	SFC 701	Professional English	3	3	0	3	3	60	40
PRACTICALS :									
	SDS 721	Web Programming Lab	2	0	3	3	3	--	100
	SDS 723	Python Programming Lab	2	0	3	3	3	--	100
	SDS 725	Minor Project	2	0	3	3	3	--	100
		Total	25	19	9	28	--	300	500

**M.Sc DATA SCIENCE
II SEMESTER**

Sl. No.	Course Code	Name of the Course	Credits	Scheme of Instruction		Total	Scheme of Examination		
				Hours per Week			Duration in Hrs.	Maximum Marks	
				L/T	P			Sem. End Exam	Con. Eval
1	SDS 702	Java Programming	4	4	0	4	3	60	40
2	SDS 704	Introduction to Modern Databases	4	4	0	4	3	60	40
3	SDS 706	Statistics -II	4	4	0	4	3	60	40
4	SDS 708	Machine Learning	4	4	0	4	3	60	40
5	SOE***	Open Elective	3	3	0	3	3	60	40
PRACTICALS :									
	SDS 722	Java Programming Lab	2	0	3	3	3	--	100
	SDS 724	Data bases Lab	2	0	3	3	3	--	100
	SDS 726	Seminar	2	0	3	3	3	--	100
		Total	25	19	6	28	--	300	500

**M.Sc DATA SCIENCE
III SEMESTER**

Sl. No.	Course Code	Name of the Course	Credits	Scheme of Instruction		Total	Scheme of Examination		
				Hours per Week			Duration in Hrs.	Maximum Marks	
				L/T	P			Sem. End Exam	Con. Eval
1	SDS 801	Information Retrieval	4	4	0	4	3	60	40
2	SDS 803	Data Security and Privacy	4	4	0	4	3	60	40
3	SDS 805	Big Data Analytics	4	4	0	4	3	60	40
4	SDS 841 SDS 843 SDS 845 SDS 847	Generic Elective – I Advanced Python Programming Internet of Things Cloud Computing Image Analytics	4	4	0	4	3	60	40
5	SDS 849 SDS 851 SDS 853 SDS 855	Generic Elective – II Optimization Techniques Social Media Analytics Business Intelligence Computational Biology	4	4	0	4	3	60	40
PRACTICALS :									
	SDS 821	Programming in R Lab	2	0	3	3	3	--	100
	SDS 823	BigData Analytics Lab	2	0	3	3	3	--	100
	SDS 825	Industrial Training	2	--	3	3	3	--	100
		Total	26	20	9	29	--	300	500

**M.Sc DATA SCIENCE
IV SEMESTER**

Sl. No.	Course Code	Name of the Course	Credits	Scheme of Instruction		Total	Scheme of Examination		
				Hours per Week			Duration in Hrs.	Maximum Marks	
				L/T	P			Sem. End Exam	Con. Eval
1	SDS 891	Project Work	8	0	3	3	--	50	150

Total Credits: 25 + 25 + 26+ 8 = 84