



Minutes of 3rd Senate Meeting held on 15 June, 2023

Attendance is placed at Appendix 'A'.	
Section A: In the Presence of Student Representatives	
Item	Senate Resolution on Item
A.3.0 Confirmation of Minutes of 2nd Senate Meeting	Confirmed
A-3.1 Announcements	
A.3.1 (a) The details of the students who graduated in 2019: <ul style="list-style-type: none">• A total of 24 students completed all the requirements for the award of degree BTech in CSE.• Three students have yet to complete the requirements and are expected to complete by the next semester. <p>A complete list of students is given in Annexure -1.</p>	Noted
A.3.1 (b) Placement details <ul style="list-style-type: none">• No. of participating organizations: 15• No. of eligible students: 16 (No active backlog criteria by the organizations)• No. of students registered: 13• No. of selection: 11• Highest Package: 45 LPA (Amazon)• Lowest Package: 5 LPA• Median Package: 14 LPA• More than 1 selection: 4 students	Noted
A.3.2 Proposals for online MTech in AI & DS and MCA programs for working professionals	Not approved. The following is recommended: <ul style="list-style-type: none">• Short-term Certificate courses in AI & DS and MCA subjects can be started with available faculty.• MTech proposals can be taken up later when at least 80% of the faculty to run this program is available.

<p>A.3.3 Detention of students having more than 12 credits of backlogs by the end of an academic year</p>	<p>Detention of students approved with following modifications to backlogs:</p> <ul style="list-style-type: none"> ● First year – 12 Credits ● Second Year – 09 Credits ● Third Year – 06 Credits
<p>A.3.4 Need of a revised curriculum for BTech Artificial Intelligence and Data Science (AI & DS) 2023 batch (<i>Annexure-3.1. & 3.2</i>)</p>	<p>Approved in principle subject to incorporation of amendments as recommended by IITH Faculty.</p>
<p>A.3.5 Need of a revised curriculum for BTech CSE 2023 batch (<i>Annexure-4.1. & 4.2</i>)</p>	<p>Approved in principle subject to incorporation of amendments as recommended by IITH Faculty</p>
<p>A.3.6 Regarding a few courses adjustment in the last semester</p>	<p>Ratified</p>
<p>A.3.7 Giving a chance to reappear in exams during the summer break, 2023, to the students who have backlogs in various courses. The students have to pay a fee of Rs. 2,000/- per credit. For major projects, it is Rs. 8,000/-. The competent authority gave relaxation to students who can't pay the fee now can pay it along with the next semester's fee. (<i>Annexure-5</i>)</p>	<p>Approved with a recommendation to increase the fees suitably in order to act as a deterrent measure</p>
<p>A.3.8 Curricula of 2021 and 2022 (<i>Annexure-6.1 & 6.2</i>)</p>	<p>Ratified</p>
<p>A.3.9 Any other item with the permission of the Chair</p>	<p>There being no other points, the meeting was concluded with the permission of the Chair.</p>

Appendix-A

The following Senate members were present in the 3rd Senate meeting Held on 15th June, 2023.

S.No.	Member	Designation
Senate Faculty Representatives		
1.	Prof. Harish Kumar Sardana, IIITR	Chairperson
2.	Commodore Manohar Nambiar (Retd), IITH	Secretary
3.	Prof. Saptarshi Majumdar, IITH	Member
4.	Prof. Bharat Bhooshan Panigrahi, IITH	Member
5.	Prof. Prem Pal, IITH	Member
6.	Dr. Ramesh K. Jallu, IIITR	Member
7.	Dr. Alka Chaddha, IIITR	Member
8.	Dr. Suresh Chavhan, IIITR	Member
9.	Dr. Nabin Kumar Meher, IIITR	Member
10.	Dr. Debmalya Sain, IIITR	Member
Senate Student Representatives		
11.	Mr. Deepak Sai Perisetla, IIITR	Member
12.	Ms. Beerelly Srinitha, IIITR	Member

The following members could not attend the meeting

1. Prof. K V L Subramaniam, IITH
2. Prof. Bheemarjuna Reddy Tamma, IITH
3. Prof. Sathya Peri, IITH
4. Dr. Subrahmanyam Kalyanasundaram, IITH
5. Dr. Viswanath Pulabaigari, IIIT Sri City
6. Dr. Neha Agarwal, IIITR
7. Dr. Priodyuti Pradan, IIITR
8. Mr. Piyush, Student Representative, IIITR

Annexure-1

<u>S No</u>	<u>Name</u>	<u>Roll No.</u>	<u>Remarks</u>
1	ABHISHEK SAHOO	CS19B1001	
2	ADARSH KUMAR SINGH	CS19B1002	No correspondence regarding withdrawal of admission
3	ADITYA AGRAWAL	CS19B1003	
4	ANANYA MANTRAVADI	CS19B1004	
5	BALIJA SUBHA SREE	CS19B1005	
6	BONAMUKKALA VAMSI KRISHNA REDDY	CS19B1006	
7	DEEPAK SAI PERISETLA	CS19B1007	
8	DOSAWADA ROHITH	CS19B1008	Honors Degree
9	DUDDUVARI GANGADHAR	CS19B1009	
10	DYAPA UDAY KUMAR REDDY	CS19B1010	
11	ILLA SAI DEEPIKA	CS19B1011	
12	JADAVATH KEERTHANA	CS19B1012	She has not registered for any of the courses after 4th Sem (Jan21-May21). No correspondence regarding withdrawal of admission
13	JATIN SACHDEVA	CS19B1013	
14	KANCHARLA GOWTHAM	CS19B1014	
15	KAUSTUBH HAREKRUSHNA KESHARWANI	CS19B1015	Backlogs
16	KOTA HARISH	CS19B1016	
17	KUSHAGRA INDURKHYA	CS19B1017	
18	MANAV CHAUDHARY	CS19B1018	Withdrawn
19	MUTYALA IMMANIYELU	CS19B1019	
20	NERELLA AKHIL	CS19B1020	
21	SAHU THANAI	CS19B1021	
22	SAI YAAMINIE GANDA	CS19B1022	Honors Degree
23	SANAGALA REETHU	CS19B1023	Backlogs
24	SIDDHARTH SAINI	CS19B1024	
25	SULTHAN VISHNU SAI	CS19B1025	
26	VADLAMUDI SAI VENKATA NIMISH	CS19B1026	
27	VIBHANSHU JAIN	CS19B1027	
28	WANKHADE ABHIJEET ARVIND	CS19B1028	
29	YALNATI SAI TEJA	CS19B1029	Backlogs
30	YASHWANTH VALLABHU	CS19B1030	

Annexure-3.1
Curriculum – BTech in AI and DS

First Year				
SEMESTER I			SEMESTER II	
Sl.No.	Course Name	Credit	Course Name	Credit
1.	Math - I	3	Math – II	3
2.	Introduction to C Programming	3	Object Oriented Programming using JAVA	3
3.	Introduction to Computer Science	2	Discrete Mathematics	3
4.	Introduction to AI and Data Science	2	Introduction to Data Structure	3
5.	Introduction to digital logic design	2	Theory of Computation	3
6.	Professional Communication and Written English	2	Finance & Accounting	1
7.	LA / CA Elective	2		
Total Credit		16	Total Credit	16

Second Year				
Semester III			Semester IV	
Sl.No.	Course Name	Credit	Course Name	Credit
1.	Probability and random process	2	Statistics for Data Science	3
2.	Operating Systems	3	Linear Algebra and Matrix Theory	3
3.	Computer Architecture	3	Design & Analysis of Algorithm	3
4.	Artificial Intelligence	3	Database Management Systems	3
5.	Foundation of Machine Learning	3	Data Science	3
6.	Python for Engineers	3	Data Analytics	2
Total Credit		17	Total Credit	17

Third Year						
Semester V			Semester VI			
			Without Internship		With Internship	
Sl. No.	Course Name	Credit	Course Name	Credit	Course Name	Credit
1.	Python for AI	2	Python for Data Science	2	Internship	6
2.	Cloud Computing	3	Data Warehousing and Data Mining	3		
3.	AI Elective 1	3	DS Elective 1	3		
4.	AI Elective 2	3	DS Elective 2	3		
5.	Ethics in AI	2	Ethics in DS	2		
6.	Free Elective 1	3	Free Elective 2	3		
7.			Science Elective 1	1		
Total Credit		16	Total Credit	17	Total Credit	6

Fourth Year								
Semester VII					Semester VIII			
Without Internship			With Internship		Without Internship		With Internship	
Sl. No.	Course Name	Credit	Course Name	Credit	Course Name	Credit	Course Name	Credit
1.	Minor Project 1	3	Minor Project 2	3	Major Project	9	AI Elective 5	3
2.	AI Elective 3	3	AI Elective 4	3			DS Elective 5	3
3.	DS Elective 3	3	DS Elective 4	3			Free Elective 7	3
4.	Free Elective 3	3	Free Elective 5	3			Science Elective	1
5.	Free Elective 4	3	Free Elective 6	3				
Total Credit		15	Total Credit 15		Total Credit 9		Total Credit 10	

List of Elective Courses in Artificial Intelligence:

1. Deep Learning.
2. Image and Video Processing.
3. Neuromorphic Computing.
4. Pattern Recognition.
5. Biomedical Signal and Image Processing.

6. AI in Healthcare.
7. Natural Language Processing.
8. Reinforcement Learning.
9. Computational Geometry.
10. Text Mining.

List of Elective Courses in Data Science:

1. Time Series Analysis.
2. Financial Management & Accounting.
3. Business Analytics.
4. Data Engineering.
5. Cyber Security.
6. Graph and Social Networking.
7. Machine learning.
8. Deep Learning.
9. Big Data for Data Science.
10. Information Retrieval.

Annexure-3.2

First Year						
Semester -1				Semester-2		
Sl.No.	Course Name	Code	Credits	Course Name	Code	Credits
1	Mathematics I	MA101	3	Mathematics II	MA102	3
2	Introduction to Programming	ID110	3	Introduction to Life Sciences	BO121	1
3	Digital Fabrication	ID120	2	Hardware Description Language	EE121	2
4	Digital Logic Design	ID130	1	Discrete Structures	CS121	3
5	Digital Systems Design	ID131	1	Introduction to Object Oriented Programming	CS122	4
6	Introduction to AI& DS	ID141	2	Independent Project	ID151	1
7	Introduction to Computer Science	CS101	2	Professional Communication Skills and Writing	ID161	2
8	LA/CA elective	LXXXX	2			
Total credits			16	Total credits		16

Second Year						
Semester - 3				Semester - 4		
Sl. No	Course Name	Code	Credits	Course Name	Code	Credits
1	Introduction to Probability, Statistics and Random Process	MA201	3	Design and Analysis of Algorithms	CS251	3
2	Data Structures	CS201	4	Operating Systems	CSXXX	3
3	Introduction to Python/ Python programming for AI and DS	CS231/ADXXX	3	Data Warehousing and Data Mining	ADXX	3
4	Computer Architecture	CS241	3	DBMS	CS261	3
5	Software Engineering	CS210	3	Engineering Elective	XXxxx	3
6	LA elective	LAXXX	3	LA Electives	LAxxx	2
7				Linear Algebra and Matrix Theory	MAXX	
Total credits			19	Total credits		20

Third Year									
Semester-5				Semester - 6					
				Without Internship			With Internship		
Sl.No	Course Name	Code	Credit	Course Name	Code	Credit	Course	Code	Credits
1	Computer Networks	CS301	4	Mini Project 1	CS391	3	Internship	CS	6
2	Artificial Intelligence	ADXX	3	AD Elective 2	ADxxx	3			
3	Machine Learning and Data Science	ADXX	3	AD Elective 3	ADxxx	3			
4	Free Elective 1	XXxxx	3	Free Elective 2	XXxxx	3			
5	AD Elective 1	ADxxx	3	Science Elective	XXxxx	1			
6	Personality Development/Pro Ethics	ID162/ ID163	2						
Total credits			18	Total credits		13			6

Fourth Year												
Semester - 7							Semester- 8					
Without Internship				With Internship			Without Internship			With Internship		
Sl.no	Course	Code	Credit	Course	Code	Credit	Course	Code	Credit	Course	Code	Credit
1	Mini Project 2 / AD Elective 4	CS491	3	Mini Project 1/ AD Elective 2	CSxxx	3	Major Project	CSxxx	9	Major Project	CSxxx	9
2	AD Elective 5	ADxxx	3	AD Elective 3	ADxxx	3				Free Elective3	XXxxx	3
3	AD Elective 6	ADxxx	3	AD Elective 4	ADxxx	3				AD Elective 6	ADxxx	3
4	Free Elective 3	XXxxx	3	AD Elective 5	ADxxx	3				Science Elective	XXxxx	1

5	Free Elective 4	XXxxx	3	Free Elective 2	XXxxx	3						
Total credits			15			15			9			16

Total Credit requirement = 126

Sl. No	Without Internship		With Internship	
	Type	Credit	Type	Credit (wo/w)
1	Basic science	13	Basic science	13
2	Basic Engg	12	Basic Engg	12
3	Dept Core	32	Dept Core	32
4	AD Core	12	AD Core	12
5	*AD Electives	15(+3)	*AD Electives	15(+3)
6	Free Electives	12	Free Electives	9
7	Life Skills	4	Life Skills	4
8	LA/CA	7	LA/CA	7
9	*Project	15 (-3)	*Internship + project	18 (-3)
10	Science Elective	1	Science Elective	1
11	Engineering Elective	3	Engineering Elective	3
Total	126		126	

*One AD Elective is in option with a mini project

Credit Courses Categorization:

Sl. No	Course Type	List of courses
1.	Basic Sciences	MA101, MA102, BO121, MA201, MAXX
2.	Basic Engg	EE121, All Courses with code IDXXX expect ID161 and ID162/163.
3.	Dept. Core	All Courses starting with CSXXX
4.	AD Core	All Courses starting with ADXXX except AD electives
5.	AD Elective	All AD Elective Courses.
6.	Free Electives	All Free Elective Courses.
7.	Life Skills	ID161 and ID162/163.

8.	LA/CA	All LA/CA Electives
9.	Project.	Minor Project 1, Minor Project 2 and Major Project.
10	Science Elective	One Science stream course
11	Engineering Elective	One Engineering stream elective course

Glossary of Terms:

1. CS Elective: A course of the student's choice, to be selected from the pool of electives offered by the CS department
2. Free Elective: A course of the student's choice, to be selected from any department (subject to meeting the prerequisites) or any online course
3. LA/CA Elective: A course of the student's choice, to be selected from the Liberal Arts and Creative Arts category
4. Science Elective: A course of the student's choice, to be selected from the Science stream

Credit Requirement: The minimum credit requirement for successful completion of the B.Tech. AIDS course is 124 credits

Semester Internship:

1. A student can enroll for an internship in either the 6th or 7th or 8th semester.
2. A student has to score a minimum of 7.5 CGPA with no active backlogs in all previous semesters for availing of the internship.
3. The duration of the internship is 6 months.
4. Only one internship is allowed in the entire BTech course.
5. A student has to complete the mandatory credits requirement before going to the internship.
6. A student opting for the internship has to inform his/her faculty adviser prior (at the beginning of a particular semester) along with the letter of approval from the industry/research institute he/she wants to get enrolled in.
7. Upon successful completion, a student has to submit the internship report to the faculty adviser. A committee will be formed to conduct the viva for evaluation.
8. Below are the guidelines which have to be followed if a student opts for an internship in a specific semester:

Sl. No.	Semester for enrolling	Guidelines
1.	6th Semester	It is mandatory for the student to complete the credit courses in either the 7th or 8th semester.
		If no courses are offered during the 8th semester, the student has to register with the 6th-semester course (during the 8th semester only) to complete the credit requirements.

		Since only one internship is allowed, if a student completes the internship prior to placement, he/she will be allowed to appear for those companies whose mandatory requirement is not internship before PPO.
2.	7th Semester	It is mandatory for the student to complete the credit courses in either the 6th or 8th semester.
		If no courses are offered during the 8th semester, the student has to register with the 6th-semester course (during the 8th semester only) to complete the credit requirements.
		Since only one internship is allowed, if a student completes the internship prior to placement, he/she will be allowed to appear for those companies whose mandatory requirement is not internship before PPO.
3.	8th Semester	A student has to complete the credit requirements before going for an internship.
		If a company offered a mandatory internship, it is possible to convert the internship to an external project provided all the details of the project will be made public and the student should be allowed to publish the thesis online.

List of AD Elective Courses :

1. Deep Learning
2. Soft Computing
3. Scalable Data Science
4. Digital Image Processing
5. A Mathematical Introduction to Robotics.
6. Advanced Signal Processing for AI and DS
7. Edge AI
8. Advanced Statistical Learning
9. Image and Video Processing.
10. Neuromorphic Computing.
11. Pattern Recognition.
12. Biomedical Signal and Image Processing.
13. AI in Health Care.
14. Natural Language Processing
15. Reinforcement Learning.
16. Computational Geometry.
17. Text Mining.
18. Social Text Mining (IIT Patna)
19. Conversational AI
20. Deep Learning for NLP
21. Machine Translation,

22. Sentiment and Emotion Analysis
23. Time Series Analysis.
24. Data Engineering.
25. Graph and Social Networking.
26. Big Data for Data Science.
27. Information Retrieval.

Annexure - 4.1

First Year						
Semester -1				Semester-2		
Sl.No.	Course Name	Code	Credits	Course Name	Code	Credits
1	Mathematics I	MA101	3	Mathematics II	MA102	3
2	Introduction to Programming	ID110	3	Introduction to Life Sciences	BO121	1
3	Digital Fabrication	ID120	2	Hardware Description Language	EE121	2
4	Digital Logic Design	ID130	1	Discrete Structures	CS121	3
5	Digital Systems Design	ID131	1	Introduction to Object Oriented Programming	CS122	4
6	Introduction to AI	ID141	1	Independent Project	ID151	1
7	Introduction to Computer Science	CS101	2	Professional Communication Skills and Writing	ID161	2
8	LA/CA elective	LXXXX	2			
Total credits			15	Total credits		16

Second Year						
Semester - 3				Semester - 4		
Sl. No	Course Name	Code	Credits	Course Name	Code	Credits
1	Introduction to Probability, Statistics and Random Process	MA201	3	Design and Analysis of Algorithms	CS251	3
2	Data Structures	CS201	4	Operating Systems	CS221	4
3	Theory of Computation	CS202	3	Compiler and Programming Language	CS232	3
4	Software Engineering	CS210	3	DBMS	CS261	3
5	Computer Architecture	CS241	3	Engineering Elective	XXxxx	3
6	Introduction to Python Programming	CS231	1	LA Electives	LAXxx	2
7	LA elective	LAXXX	3			
Total credits			20	Total credits		18

Third Year									
Semester-5				Semester - 6					
				Without Internship			With Internship		
Sl.No	Course Name	Code	Credit	Course Name	Code	Credit	Course	Code	Credits
1	Computer Networks	CS301	4	Mini Project 1	CS391	3	Internship	CS	6
2	Foundations of Machine Learning	CS311	3	CS Elective 3	CSxxx	3			
3	CS Elective 1	CSxxx	3	CS Elective 4	CSxxx	3			
4	Free Elective 1	XXxxx	3	Free Elective 2	XXxxx	3			
5	CS Elective 2	CSxxx	3	Science Elective	XXxxx	1			
6	Personality Development/Pro Ethics	ID162/ ID163	2						
Total credits			18	Total credits		13			6

Fourth Year												
Semester - 7						Semester- 8						
Without Internship			With Internship			Without Internship			With Internship			
Sl.no	Course	Code	Credit	Course	Code	Credit	Course	Code	Credit	Course	Code	Credit
1	Mini Project 2 / CS Elective 5	CS491	3	Mini Project 1/ CS Elective 3	CSxxx	3	Major Project	CSxxx	9	Major Project	CSxxx	
2	CS Elective 6	CSxxx	3	CS Elective 4	CSxxx	3				Free Elective 3	XXxxx	

3	CS Elective 7	CSxx x	3	CS Elective 5	CSxx x	3				CS Elective 7	CSxx x	
4	Free Elective 3	XXxx x	3	CS Elective 6	CSxx x	3				Science Elective	XXxx x	
5	Free Elective 4	XXxx x	3	Free Elective 2	XXxx x	3						
Total credits			15			15			9			

Total Credit requirement = 124

Without Internship			With Internship	
Sl. No	Type	Credit	Type	Credit (wo/w)
1	Basic science	11	Basic science	11
2	Basic Engg	14	Basic Engg	12
3	Dept Core	43	Dept Core	43
4	*Dept Electives	21 (-3)	*Dept Electives	21 (-3)
5	Free Electives	12	Free Electives	9
6	Life Skills	4	Life Skills	4
7	LA/CA	7	LA/CA	7
8	*Project	15 (+3)	*Internship+ project	12 (+3)
Total	124		124	

*One CS Elective is in option with a mini project

Credit Courses Categorization:

Sl. No.	Course Type	List of courses
1.	Basic Sciences	MA101, MA102, BO121, MA201.
2.	Basic Engg	All Courses with code IDXXX expect ID161 and ID162/163.
3.	Dept. Core	All Courses starting with CSXXX except CS Elective.
4.	Dept. Elective	All CS Elective Courses.
5.	Free Electives	All Free Elective Courses.
6.	Life Skills	ID161 and ID162/163.
7.	LA/CA	All LA/CA Electives
8.	Project.	Minor Project 1, Minor Project 2 and Major Project.

Glossary of Terms:

1. **CS Elective:** A course of the student's choice, to be selected from the pool of electives offered by the CS department
2. **Free Elective:** A course of the student's choice, to be selected from any department (subject to meeting the prerequisites) or any online course
3. **LA/CA Elective:** A course of the student's choice, to be selected from the Liberal Arts and Creative Arts category
4. **Science Elective:** A course of the student's choice, to be selected from the Science stream

Credit Requirement: The minimum credit requirement for successful completion of the B.Tech course is 124 credits

Semester Internship:

1. A student can enroll for an internship in either the 6th or 7th or 8th semester.
2. A student has to score a minimum of 7.5 CGPA with no active backlogs in all previous semesters for availing of the internship.
3. The duration of the internship is 6 months.
4. Only one internship is allowed in the entire BTech course.
5. A student has to complete the mandatory credits requirement before going to the internship.
6. A student opting for the internship has to inform his/her faculty adviser prior (at the beginning of a particular semester) along with the letter of approval from the industry/research institute he/she wants to get enrolled in.
7. Upon successful completion, a student has to submit the internship report to the faculty adviser. A committee will be formed to conduct the viva for evaluation.
8. Below are the guidelines which have to be followed if a student opts for an internship in a specific semester:

Sl. No.	Semester for enrolling	Guidelines
1.	6th Semester	It is mandatory for the student to complete the credit courses in either the 7th or 8th semester.
		If no courses are offered during the 8th semester, the student has to register with the 6th-semester course (during the 8th semester only) to complete the credit requirements.
		Since only one internship is allowed, if a student completes the internship prior to placement, he/she will be allowed to appear for those companies whose mandatory requirement is not internship before PPO.

2.	7th Semester	It is mandatory for the student to complete the credit courses in either the 6th or 8th semester.
		If no courses are offered during the 8th semester, the student has to register with the 6th-semester course (during the 8th semester only) to complete the credit requirements.
		Since only one internship is allowed, if a student completes the internship prior to placement, he/she will be allowed to appear for those companies whose mandatory requirement is not internship before PPO.
3.	8th Semester	A student has to complete the credit requirements before going for an internship.
		If a company offered a mandatory internship, it is possible to convert the internship to an external project provided all the details of the project will be made public and the student should be allowed to publish the thesis online.

B.Tech Honors

IIT Raichur has provision for an Honors program that is designed to challenge the brighter and more ambitious students, without burdening an average student. Some salient features are listed below:

- A student can opt for Honors after the completion of the second year.
- The student should have a CGPA ≥ 8.0 (without any backlog) at the end of the fourth semester.
- The student must complete an additional 12 discipline credits.
- The student should have CGPA ≥ 8.0 (without any backlog) at the end of the eighth semester and should not have any backlog throughout the B.Tech course.
- Please see the detailed guidelines for enrollment in Honors courses.

Probable list of CS Electives: Elective courses offered by the CSE department of IITH and following

1. Knowledge Representation and Reasoning
2. Machine Learning
3. Logic in Computer Science
4. Formal Verification
5. Information Retrieval
6. Cyber Security
7. Cryptography (and Network security)
8. Big Data analysis and Applications
9. Introduction to Multi-Agent Modeling

10. Graphics and Multimedia
11. Data Mining and warehousing
12. Computational Geometry
13. Digital Image Processing
14. Soft Computing and evolutionary AI
15. Distributed Computing
16. High-performance computing
17. Cloud Computing
18. Human-Computer Interaction
19. VLSI System design
20. Wireless networks
21. Advanced Algorithms
22. Combinatorial Optimization
23. Introduction to Approximation Theory and Optimization
24. Deep Learning with Graphs
25. Introduction to Quantum Machine Learning
26. Maths Tool for Machine learning and Data Science

Annexure-4.2

First Year						
Semester -1				Semester-2		
Sl.No.	Course Name	Code	Credits	Course Name	Code	Credits
1	Mathematics I	MA101	3	Mathematics II	MA102	3
2	Introduction to Programming	ID110	3	Introduction to Life Sciences	BO121	1
3	Digital Fabrication	ID120	2	Hardware Description Language	EE121	2
4	Digital Logic Design	ID130	1	Discrete Structures	CS121	3
5	Digital Systems Design	ID131	1	Introduction to Object Oriented Programming	CS122	4
6	Introduction to AI& DS	ID141	2	Independent Project	ID151	1
7	Introduction to Computer Science	CS101	2	Professional Communication Skills and Writing	ID161	2
8	LA/CA elective	LXXXX	2			
Total credits			16	Total credits		16

Second Year						
Semester - 3				Semester - 4		
Sl. No	Course Name	Code	Credits	Course Name	Code	Credits
1	Introduction to Probability, Statistics and Random Process	MA201	3	Design and Analysis of Algorithms	CS251	3
2	Data Structures	CS201	4	Operating Systems Theory/ Operating Systems Lab	CS221/ CS222	3+1
3	Theory of Computation	CS202	3	Compiler and Programming Language	CS232	3
4	Software Engineering	CS210	3	DBMS	CS261	3
5	Computer Architecture	CS241	3	Engineering Elective	XXxxx	3
6	Introduction to Python Programming	CS231	1	LA Electives	LAxxx	2
7	LA elective	LAXXX	3			
Total credits			20	Total credits		18

Third Year

Third Year									
Semester-5				Semester - 6					
				Without Internship			With Internship		
Sl.No	Course Name	Code	Credit	Course Name	Code	Credits	Course	Code	Credits
1	Computer Networks	CS301	4	Mini Project 1	CS391	3	Internship	CS	6
2	Foundations of Machine Learning	CS311	3	CS Elective 3	CSxxx	3			
3	CS Elective 1	CSxxx	3	CS Elective 4	CSxxx	3			
4	Free Elective 1	XXxxx	3	Free Elective 2	XXxxx	3			
5	CS Elective 2	CSxxx	3	Science Elective	XXxxx	1			
6	Personality Development/ Pro Ethics	ID162/ ID163	2						
Total credits			18	Total credits			13	6	

Fourth Year

Fourth Year												
Semester - 7							Semester- 8					
Without Internship				With Internship			Without Internship			With Internship		
Sl.no	Course	Code	Credit	Course	Code	Credit	Course	Code	Credit	Course	Code	Credit
1	Mini Project 2 / CS Elective 5	CS491	3	Mini Project 1/ CS Elective 3	CSxxx	3	Major Project	CSxxx	9	Major Project	CSxxx	9
2	CS Electiv 6	CSxxx	3	CS Elective 4	CSxxx	3				Free Elective3	XXxxx	3
3	CS Elective 7	CSxxx	3	CS Elective 5	CSxxx	3				CS Elective 7	CSxxx	3
4	Free Elective 3	XXxxx	3	CS Elective 6	CSxxx	3				Science Elective	XXxxx	1
5	Free Elective 4	XXxxx	3	Free Elective 2	XXxxx	3						
Total credits			15	Total credits			15	Total credits			9	16

Total Credit requirement = 125

	Without Internship		With Internship	
Sl. No	Type	Credit	Type	Credit (wo/w)
1	Basic science	11	Basic science	11
2	Basic Engg	15	Basic Engg	15
3	Dept Core	43	Dept Core	43
4	*Dept Electives	21 (-3)	*Dept Electives	21 (-3)
5	Free Electives	12	Free Electives	9
6	Life Skills	4	Life Skills	4
7	LA/CA	7	LA/CA	7
8	*Project	15 (+3)	*Internship+ project	12 (+3)
Total	125		125	

- *One CS Elective is in option with a mini project

Credit Courses Categorization:

Sl. No.	Course Type	List of courses
1.	Basic Sciences	MA101, MA102, BO121, MA201.
2.	Basic Engg	All Courses with code IDXXX expect ID161 and ID162/163.
3.	Dept. Core	All Courses starting with CSXXX except CS Elective.
4.	Dept. Elective	All CS Elective Courses.
5.	Free Electives	All Free Elective Courses.
6.	Life Skills	ID161 and ID162/163.
7.	LA/CA	All LA/CA Electives
8.	Project.	Minor Project 1, Minor Project 2 and Major Project.

Glossary of Terms:

1. **CS Elective:** A course of the student's choice, to be selected from the pool of electives offered by the CS department
2. **Free Elective:** A course of the student's choice, to be selected from any department (subject to meeting the prerequisites) or any online course
3. **LA/CA Elective:** A course of the student's choice, to be selected from the Liberal Arts and Creative Arts category
4. **Science Elective:** A course of the student's choice, to be selected from the Science stream

Credit Requirement: The minimum credit requirement for successful completion of the B.Tech course is 124 credits

Semester Internship:

1. A student can enroll for an internship in either the 6th or 7th or 8th semester.

2. A student has to score a minimum of 7.5 CGPA with no active backlogs in all previous semesters for availing of the internship.
3. The duration of the internship is 6 months.
4. Only one internship is allowed in the entire BTech course.
5. A student has to complete the mandatory credits requirement before going to the internship.
6. A student opting for the internship has to inform his/her faculty adviser prior (at the beginning of a particular semester) along with the letter of approval from the industry/research institute he/she wants to get enrolled in.
7. Upon successful completion, a student has to submit the internship report to the faculty adviser. A committee will be formed to conduct the viva for evaluation.
8. Below are the guidelines which have to be followed if a student opts for an internship in a specific semester:

Sl. No.	Semester for enrolling	Guidelines
1.	6th Semester	It is mandatory for the student to complete the credit courses in either the 7th or 8th semester.
		If no courses are offered during the 8th semester, the student has to register with the 6th-semester course (during the 8th semester only) to complete the credit requirements.
		Since only one internship is allowed, if a student completes the internship prior to placement, he/she will be allowed to appear for those companies whose mandatory requirement is not internship before PPO.
2.	7th Semester	It is mandatory for the student to complete the credit courses in either the 6th or 8th semester.
		If no courses are offered during the 8th semester, the student has to register with the 6th-semester course (during the 8th semester only) to complete the credit requirements.
		Since only one internship is allowed, if a student completes the internship prior to placement, he/she will be allowed to appear for those companies whose mandatory requirement is not internship before PPO.
3.	8th Semester	A student has to complete the credit requirements before going for an internship.
		If a company offered a mandatory internship, it is possible to convert the internship to an external project provided all the details of the project will be made public and the student should be allowed to publish the thesis online.

B.Tech Honors

IIIT Raichur has provision for an Honors program that is designed to challenge the brighter and more ambitious students, without burdening an average student. Some salient features are listed below:

- A student can opt for Honors after the completion of the second year.
- The student should have a CGPA ≥ 8.0 (without any backlog) at the end of the fourth semester.

- The student must complete an additional 12 discipline credits.
- The student should have CGPA ≥ 8.0 (without any backlog) at the end of the eighth semester and should not have any backlog throughout the B.Tech course.
- Please see the detailed guidelines for enrollment in Honors courses.

Probable list of CS Electives:

1. Knowledge Representation and Reasoning
2. Machine Learning
3. Logic in Computer Science
4. Formal Verification
5. Information Retrieval
6. Cyber Security
7. Cryptography (and Network security)
8. Big Data analysis and Applications
9. Introduction to Multi-Agent Modeling
10. Graphics and Multimedia
11. Data Mining and warehousing
12. Computational Geometry
13. Digital Image Processing
14. Soft Computing and evolutionary AI
15. Distributed Computing
16. High-performance computing
17. Cloud Computing
18. Human-Computer Interaction
19. VLSI System design
20. Wireless networks
21. Advanced Algorithms
22. Combinatorial Optimization
23. Introduction to Approximation Theory and Optimization
24. Deep Learning with Graphs
25. Introduction to Quantum Machine Learning
26. Maths Tool for Machine learning and Data Science

Annexure-5

<u>S.No.</u>	Code	Credits	Name
1	CS251	3	Theory of Computation
2	MA201	1	Introduction to Probability
3	CS232	3/2	Compiler and Programming Language/Compiler II
4	CS391/ CS491	3	Mini-project
5	CS492	9	Major Project
6	CS311	3	Foundations of Machine Learning
7	ID161	2	Professional Communication Skills and Writing
8	CS231	1	Principles of Programming Language
9	MA211	1	Complex Variables

Annexure-6.1

Curriculum (2020 Batch)

First Year						
Semester - 1				Semester - 2		
Sl. No	Course Name	Code	Credits	Course Name	Code	Credits
1	Calculus I	MA101	1	Vector Calculus	MA121	1
2	Calculus II	MA102	2	Elementary Linear Algebra	MA122	1
3	Introduction to Programming	ID110	3	Differential Equations	MA123	1
4	Digital Fabrication	ID120	2	Introduction to Life Sciences	BO121	1
5	Digital Logic Design	ID130	1	Hardware Description Language	EE121	2
6	Digital Systems Design	ID131	1	Discrete Structures	CS121	3
7	Introduction to AI	ID141	1	Introduction to Data Structure	CS122	3
8	Introduction to Computer Science	CS101	2	Independent Project	ID151	1
9	LA/CA elective	LXXXX	2	Professional Communication Skills and Writing	ID161	2
Total credits			15	Total credits		15

Second Year						
Semester - 3				Semester - 4		
Sl. No	Course Name	Code	Credits	Course Name	Code	Credits
1	Introduction to Probability	MA201	1	Theory of Computation	CS251	3
2	Data Structures	CS201	3	Operating System 2	CS221	3
3	Operating System 1	CS220	1	Compiler and Programming Language	CS232	3
4	Design and Analysis of Algorithms	CS202	3	DBMS	CS261	3
5	Software Engineering	CS210	3	Engineering Elective	XXxxx	3
6	Computer Architecture	CS241	3	LA Electives	LAXxx	2
7	Principles of Programming Language	CS231	1			
8	LA elective	LAXXX	3			
Total credits			18	Total credits		17

Third Year

Third Year									
Semester-5				Semester - 6					
				Without Internship			With Internship		
Sl.No	Course Name	Code	Credit	Course Name	Code	Credit	Course	Code	Credit
1	Computer Networks	CS301	4	Mini Project 1	CS391	3	Internship	CS	6
2	Foundations of Machine Learning	CS311	3	CS Elective 3	CSxxx	3			
3	CS Elective 1	CSxxx	3	CS Elective 4	CSxxx	3			
4	Free Elective 1	XXxxx	3	Free Elective 2	XXxxx	3			
5	CS Elective 2	CSxxx	3	Science Elective	XXxxx	1			
6	Personality Development/Pro Ethics	ID162 /ID163	2						
Total			18			13			6

Fourth Year

Fourth Year												
Semester - 7							Semester - 8					
Without Internship				With Internship			Without Internship			With Internship		
Sl.no	Course	Type	Credit	Course	Type	Credit	Course	Type	Credit	course	Type	Credit
1	Mini Project 2 / CS Elective 5	CS491	3	Minor Project 1 / CS Elective 3	CSxxx	3	Major Project	CS	9	Major Project	CSxxx	9
2	CS Elective 6	CSxxx	3	CS Elective 4	CSxxx	3				Free Elective 3	XXxxx	3
3	CS Elective 7	CSxxx	3	CS Elective 5	CSxxx	3				CS Elective 7	CSxxx	3
4	Free Elective 3	XXxxx	3	CS Elective 6	CSxxx	3				Science Elective	XXxxx	1
5	Free Elective 4	XXxxx	3	Free Elective 2	XXxxx	3						
Total			15			15			9			16

Total Credit requirement = 120

Sl. No	Without Internship		With Internship	
	Type	Credit	Type	Credit (wo/w)
1	Basic science	9	Basic science	9
2	Basic Engg	17	Basic Engg	17
3	Dept Core	38	Dept Core	38
4	*Dept Electives	21 (-3)	*Dept Electives	21 (-3)
5	Free Electives	12	Free Electives	9
6	Life Skills	4	Life Skills	4
7	LA/CA	7	LA/CA	7
8	*Project	15 (+3)	*Internship+ project	12 (+3)
Total		120		120

* One CS Elective is in option with a minor project

Glossary of Terms:

1. **CS Elective:** A course of the student's choice, to be selected from the pool of electives offered by the CS department
2. **Free Elective:** A course of the student's choice, to be selected from any department (subject to meeting the prerequisites) or any online course
3. **LA/CA Elective:** A course of the student's choice, to be selected from the Liberal Arts and Creative Arts category
4. **Science Elective:** A course of the student's choice, to be selected from the Science stream

Credit Requirement: The minimum credit requirement for successful completion of the B.Tech course is 120 credits

Semester Internship:

1. Semester Internship is optional and can be undertaken from **January to June (i.e. in the 6th semester)**.
2. Only students with **CGPA > 8.0** at the end of the 4th semester are eligible.
3. The duration of the semester internship must be of minimum six months and only with a single company. **It cannot be fractalized.**
4. Semester Interns can be recruited **only in Phase I (July to October i.e. in the 5th semester)**.
5. It will be of 6 credits and evaluation will be done by the faculty committee at the end of the internship
6. Students need to submit Internship Report for grading by IITH Faculty
7. The students should complete the credits of the 6th semester missed out due to Semester Internship in any other semesters by end of the 8th semester for the award of B.Tech degree.
8. The students will not be allowed to register for any course credits during the semester internship irrespective of whether the internship is onsite or online.
9. The students should abide by the principle of making use of the semester completely to understand the industry environment and should exceed the expectations of the company offering semester internships. Students should use this opportunity to build professional networks in the industry.

Provision for Online Courses:

1. After the completion of second year, a student can opt for taking up an online course **(Subject to approval from the Department)** against Free electives.
2. The list of online platforms from which courses can be taken up will be updated by the department.
3. The maximum allowed credits for online course (OC) is 6 credits
4. The minimum course hours for an OC should be 40 hours
5. A student cannot take more than 3 credits or one OC in a semester.
6. A student cannot take any course which he/she has already taken in any previous semester or is already included in the list of departmental core subject
7. Evaluation of OC will also be done by a faculty of IIITR **(to be decided by the HoD of the department)** and the final grades will be based on the following rule:

Final score = 0.4 * marks obtained on the online platform + 0.6 * Marks obtained in the evaluation conducted by the faculty

B.Tech Honors

IIIT-Raichur has provision for an Honors program that is designed to challenge the brighter and more ambitious students, without burdening an average student. Some salient features are listed below:

- A student can opt for Honors after the completion of the second year.
- The student should have a CGPA ≥ 8.0 (without any backlog) at the end of the fourth semester.
- The student must complete an additional 12 discipline credits.
- Out of the 12 credits, a student may take up to 6 credits of Online Courses (OC) **(subject to approval from the authority concerned)**.
- The student should have CGPA ≥ 8.0 (without any backlog) at the end of the eighth semester and should not have any backlog throughout the B.Tech course.

Probable list of CS Electives: Elective courses offered by the CSE department of IITH and following

1. Knowledge Representation and Reasoning
2. Machine Learning
3. Logic in Computer Science
4. Formal Verification

5. Information Retrieval
6. Cyber Security
7. Cryptography (and Network security)
8. Big Data analysis and Applications
9. Introduction to Multi-Agent Modelling
10. Graphics and Multimedia
11. Data Mining and warehousing
12. Computational Geometry
13. Digital Image Processing
14. Soft Computing and evolutionary AI
15. Distributed Computing
16. High-performance computing
17. Cloud Computing
18. Human-Computer Interaction
19. VLSI System design
20. Wireless networks
21. Advanced Algorithms
22. Combinatorial Optimization

Note: This is a probable list of electives and may change if required

Annexure-6.2

Curriculum (2021 Batch onwards)

First Year							
Semester - 1				Semester - 2			
Sl. No	Course Name	Code	Credits	Course Name	Code	Credits	
1	Maths I	MA101	3	Maths II	MA102	3	
2	Introduction to Programming	ID110	3	Introduction to Life Sciences	BO121	1	
3	Digital Fabrication	ID120	2	Hardware Description Language	EE121	2	
4	Digital Logic Design	ID130	1	Discrete Structures	CS121	3	
5	Digital Systems Design	ID131	1	Introduction to Data Structure	CS122	3	
6	Introduction to AI	ID141	1	Independent Project	ID151	1	
7	Introduction to Computer Science	CS101	2	Professional Communication Skills and Writing	ID161	2	
8	LA/CA elective	LXXXX	2				
Total credits			15	Total credits			15

Second Year							
Semester - 3				Semester - 4			
Sl. No	Course Name	Code	Credits	Course Name	Code	Credits	
1	Introduction to Probability	MA201	1	Theory of Computation	CS251	3	
2	Data Structures	CS201	3	Operating System 2	CS221	3	
3	Operating System 1	CS220	1	Compiler and Programming Language	CS232	3	
4	Design and Analysis of Algorithms	CS202	3	DBMS	CS261	3	
5	Software Engineering	CS210	3	Engineering Elective	XXxxx	3	
6	Computer Architecture	CS241	3	LA Electives	LAXxx	2	
7	Principles of Programming Language	CS231	1				
8	LA elective	LAXXX	3				
Total credits			18	Total credits			17

Third Year

Third Year										
Semester-5					Semester - 6					
				Without Internship			With Internship			
Sl.No	Course Name	Code	Credit	Course Name	Code	Credit	Course	Code	Credit	
1	Computer Networks	CS301	4	Mini Project 1	CS391	3	Internship	CS	6	
2	Foundations of Machine Learning	CS311	3	CS Elective 3	CSxxx	3				
3	CS Elective 1	CSxxx	3	CS Elective 4	CSxxx	3				
4	Free Elective 1	XXxxx	3	Free Elective 2	XXxxx	3				
5	CS Elective 2	CSxxx	3	Science Elective	XXxxx	1				
6	Personality Development/Pro Ethics	ID162 /ID163	2							
Total			18			13			6	

Fourth Year

Fourth Year													
Semester - 7							Semester - 8						
Without Internship				With Internship			Without Internship			With Internship			
Sl.no	Course	Type	Credit	Course	Type	Credit	Course	Type	Credit	course	Type	Credit	
1	Mini Project 2 / CS Elective 5	CS491	3	Minor Project 1 / CS Elective 3	CSxxx	3	Major Project	CS	9	Major Project	CSxxx	9	
2	CS Elective 6	CSxxx	3	CS Elective 4	CSxxx	3				Free Elective 3	XXxxx	3	
3	CS Elective 7	CSxxx	3	CS Elective 5	CSxxx	3				CS Elective 7	CSxxx	3	
4	Free Elective 3	XXxxx	3	CS Elective 6	CSxxx	3				Science Elective	XXxxx	1	
5	Free Elective 4	XXxxx	3	Free Elective 2	XXxxx	3							
Total			15			15			9			16	

Total Credit requirement = 120

Sl. No	Without Internship		With Internship	
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7	LA/CA	7	LA/CA	7
8	*Project	15 (+3)	*Internship+ project	12 (+3)
Total		120		120

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Probable list of CS Electives: Elective courses offered by the CSE department of IITH and following

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2. Machine Learning
3. Logic in Computer Science
4. Formal Verification

5. Information Retrieval
6. Cyber Security
7. Cryptography (and Network security)
8. Big Data analysis and Applications
9. Introduction to Multi-Agent Modelling
10. Graphics and Multimedia
11. Data Mining and warehousing
12. Computational Geometry
13. Digital Image Processing
14. Soft Computing and evolutionary AI
15. Distributed Computing
16. High-performance computing
17. Cloud Computing
18. Human-Computer Interaction
19. VLSI System design
20. Wireless networks
21. Advanced Algorithms
22. Combinatorial Optimization

Note: This is a probable list of electives and may change if required