



VIGNAN'S

Foundation for Science, Technology & Research

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CIRCULAR

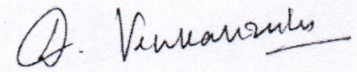
Date: 07.06.2022

Department of CSE is going to conduct Board of Studies (BoS) meeting for the B.Tech CSE programme on **27.06.2022** from 10.00AM in blended mode. (Physical meeting : CSE Conference Hall, Third floor, JC Bose Block, VFSTR and virtual meeting link : https://us02web.zoom.us/j/6400485257?pwd=jN9EMqLRUorw6gc_Z3T5gmA-QP1BvNQ). All the members are requested to make it convenient to attend the meeting.

1	Dr. Venkatesulu Dondeti	Professor & Head, Department of CSE, VFSTR Deemed to be University	Chair Person
2	Prof. R.V.B.Subramanyam	Professor Department of CSE, NIT Warangal	External Member (Academic)
3	Prof. C.R.Rao	Professor SCIS, University of Hyderabad	External Member (Academic)
4	Dr.B.Venkata Ramana	Assoc. Professor & HoD Department of CSE, IIT Tirupathi	External Member (Academic)
5	Dr.V. Radha	Assoc. Professor IDRBT, Hyderabad	External Member (Academic)
6	Dr. Nagesh Bhattu Sristy	Asst. Professor Department of CSE, NIT AP	External Member (Academic)
7	Dr.M.Dinesh	Research Scientist Philips, Bangalore	External Member (Industry)
8	Dr. Nirupama Bhat	Professor, Department of CSE, VFSTR Deemed to be University	Internal Member
9	Dr. S V Phani Kumar	Assoc. Professor, Department of CSE, VFSTR Deemed to be University	Internal Member
10	Dr. Mainak Biswas	Assoc. Professor, Department of CSE, VFSTR Deemed to be University	Internal Member
11	Dr. U. Srilakshmi	Asst. Professor, Department of CSE, VFSTR Deemed to be University	Internal Member
12	Mrs. B. Jyostna Devi	Asst. Professor, Department of CSE, VFSTR Deemed to be University	Internal Member
13	Dr. D. Radha Rani	Asst. Professor, Department of CSE, VFSTR Deemed to be University	Invited Member (Nominee – Dean R&D)
14	Mr. V Ramakrishna Sajja	Asst. Professor, Department of CSE, VFSTR Deemed to be University	Secretary (Ex-officio)

Agenda of the BoS Meeting:

1. Discussions and approval of R22 B.Tech. CSE Program Structure.
2. Discussion on revision of R22 B.Tech. CSE course contents.
3. Ratification of B.Tech. CSE Program Programme Educational Objectives
4. Any other point with the permission of Chair.



BoS, Chair Person



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Date: 27.06.2022

Minutes of Board of Studies Meeting

Board of Studies (BoS) meeting of B.Tech., CSE programme was conducted on 27.06.2022 in blended mode from 10.00 AM to 12.00 PM. (Physical meeting : CSE Conference Hall, Third floor, JC Bose Block, VFSTR and virtual meeting link : <https://us02web.zoom.us/j/6400485257?pwd=jN9EMqLRUorw6gcZ3T5gmA-QP1BvNQ>)

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2. Discussion on revision of R22 B.Tech. CSE course contents.
3. Ratification of B.Tech. CSE Program Programme Educational Objectives
4. Any other point with the permission of Chair.

The following members were present either thorough offline or online.

S. No.	Name and designation of the Member	Position
1	Dr. Venkatesulu Dondeti Professor & Head, Department of CSE, VFSTR Deemed to be University	Chair Person
2	Prof. R.V.B.Subramanyam Professor Department of CSE, NIT Warangal	External Member (Academic)
3	Prof. C.R.Rao Professor SCIS, University of Hyderabad	External Member (Academic)
4	Dr.B.Venkata Ramana Assoc. Professor & HoD Department of CSE, IIT Tirupathi	External Member (Academic)
5	Dr. Nagesh Bhattu Sristy Asst. Professor Department of CSE, NIT AP	External Member (Academic)
6	Dr. Nirupama Bhat Professor, Department of CSE, VFSTR Deemed to be University	Internal Member

7	Dr. S V Phani Kumar Assoc. Professor, Department of CSE, VFSTR Deemed to be University	Internal Member
8	Dr. Mainak Biswas Assoc. Professor, Department of CSE, VFSTR Deemed to be University	Internal Member
9	Dr. U. Srilakshmi Asst. Professor, Department of CSE, VFSTR Deemed to be University	Internal Member
10	Mrs. B. Jyostna Devi Asst. Professor, Department of CSE, VFSTR Deemed to be University	Internal Member
11	Dr. D. Radha Rani Asst. Professor, Department of CSE, VFSTR Deemed to be University	Invited Member (Nominee – Dean R&D)
12	Mr. S Deva Kumar Asst. Professor, Department of CSE, VFSTR Deemed to be University	Secretary (Ex-officio)

The following members have taken leave of absence:

S. No.	Name and designation of the Member	Position
1	Dr.V. Radha Assoc. Professor, IDRBT, Hyderabad	External Member (Academic)
2	Dr.M.Dinesh Research Scientist, Philips, Bangalore	External Member (Industry)

Chairperson Dr. Venkatesulu Dondeti, Professor and Head, department of CSE, VFSTR opened the meeting by welcoming and introducing the external members, invitees to the internal members. Chairperson presented about the *NEP 2020 Compliant Regulation - R22* which emphasis on creating *learning centric* (continuous learning and continuous assessment model), offering B.Tech., B.Tech. with Honours/ Research Honours/ Minor/ Add-on Diploma, Dual degree (B.Tech. + M.Tech./MBA, or M.Tech. + Ph.D.), providing multiple entry and multiple exits.

The following points were discussed in the BoS meeting:

1. Regulation R22.
2. Curriculum structure with credits, credits distribution.
3. Approval of Programme Education Objectives
4. 2 Modules instead of 5 units.
5. Assessment methods (Formative & Summative).
6. Grading Schemes.
7. Electives and streams/pools.
8. Minor / Honor courses.

The following resolutions made after the discussion:

1. Dr. D Venkatesulu, HoD, CSE has invited all the external and internal members and presented the glimpses of R22 Curriculum.

He explained the process followed in the preparation of R22 Course Contents, CBCS has followed in this R22 Programme Curriculum also. R22 Course Structure is attached as Annexure I.

Dr. M.Nirupama Bhat has initiated the presentation on R22 CSE Curriculum. All the BoS members have approved the curriculum.

2. He also suggested to change the title of Competitive Coding as Competitive Coding Level-1.

Dr. S.V.Phani Kumar has explained the commonality being followed across the departments.

3. Prof. C. R. Rao suggested to combine “Data Structure & Algorithms” course with “Practicing Data Structures” and make title as “Data structures” and offer it 2(1) by increasing lecture hours by 1 and practicing hours by 2. Also suggested to change “Environmental Studies” from 2(1) to 2(2). With this changes credits don't increase either in 2(1) or 2(2).

Dr.Venkatesulu Dondeti conveyed to external members that no course should exceed more than 4 credits as per the common guidelines fixed in R22 regulations. Hence movement of course “Environmental Studies” not required from 2(1) to 2(2).

4. Prof. C. R. Rao & Dr. Nagesh Bhattu suggested to move “Operating Systems” course from 3(2) to 2(2) as it is basic course. Also suggested to move “Department Elective – I” from 2(2) to 3(1). Also suggested to move “Computer Networks” course from 3(1) to 3(2) for the adjustment of credits.

Committee accepted the comment, and it has been considered.

5. Dr. B. Venkata Ramana suggested to increase the practical hours by 2 for “Web Technologies” as it is important course for all the software applications development. It is also suggested to make L-T-P as 2-2-0 for “Artificial Intelligence” for the adjustment of credits.

Committee accepted the comment, and it has been considered.

6. Prof. R.V.Subramanyam suggested to drop the word “course” besides the “Inter – Departmental Project.”

Dr. Venkatesulu Dondeti explained about that course means online courses like NPTEL/MOOCs.

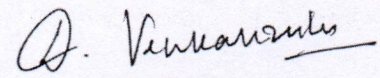
7. Prof. R.V.Subramanyam suggested to keep Inter – Departmental Project floated in both semesters of III year as “Inter – Departmental Project : Phase-I” and Inter – Departmental Project : Phase-II” to avoid ambiguity.
Committee accepted the comment, and it has been considered.
8. Prof. C.R.Rao suggested to keep prerequisites for all the courses being offered in department electives category as we are following CBCS.
Committee accepted the comment, and it has been considered.
9. Prof. C.R.Rao suggested to keep the courses like “High Performance Computing”, “Design Thinking” and “Data Science Using R” etc., under Honors specialization.
Committee accepted the comment, and it has been considered.
10. BoS Members approved the revised regulations, curriculum structure, syllabus of B.Tech., CSE programmes and it follows based on the NEP 2020. Curriculum structure is provided in Appendix-I.
11. Major restructuring has taken place in the curriculum which is oriented towards continuous learning and assessment based on Module structure.
12. Major reformation has taken place in the curriculum by offering Honours/Specialization degree or Minor degree through 20 more credits with additional courses.
13. The curriculum encompasses the courses that enable employability or entrepreneurship or skill development, provided in Appendix- II.
14. The significant changes are made in the content of all courses and hence the courses are considered as new courses provided in Appendix- III.
15. Stakeholders feedback is analyzed thoroughly, and the curriculum follows the choice-based credit system (CBCS).
16. All the students of R21 regulation are migrated to R22 curriculum from 2nd year 1st semester onwards.
17. The total average percentage of syllabus revised was 50% compared to previous curriculum.
18. The Program Educational Objectives (PEOs) are approved in its current form, and no changes are recommended for department Vision, Mission, and Program Specific Outcomes (PSOs).
PEO 1: Graduates acquire extensive technical knowledge and related skills required to demonstrate themselves as professionals or pursue higher education.

PEO 2: Graduates adapt to upskilling and excel in their careers despite future technological changes, and demonstrate research aptitude to generate innovative engineering solutions.

PEO 3: Graduates acquire the potential to contribute for the field of computing as well as for the societal development by demonstrating professional, social and ethical practices.

Based on the suggestions given by the members, the Chairperson of BoS told that, those fruitful suggestions would be incorporated appropriately in the curriculum and syllabi of the regulation R22, and this will be recommended to the Academic Council of VFSTR for the approval.

There being no further points for discussion, the Chairperson thanked all the external, internal, invited members and announced that the meeting was adjourned.


Chairperson



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Appendix - I

B.Tech. CSE Programme :: Curriculum Structure

I Year I Semester

S No.	Course Title	L	T	P	C	Offering Department	Remarks
1	Linear Algebra and Ordinary Differential Equations	3	2	-	4	Mathematics	Basic Sciences
2	Semiconductor Physics & Electromagnetics	3	-	2	4	Physics	Basic Sciences
3	Basic of Electrical and Electronics Engineering	2	-	2	3	EEE	Basic Engineering
4	Engineering Chemistry	3	-	2	4	Chemistry	Basic Sciences
5	Problem Solving through Programming - I	2	2	2	4	CSE	Professional Core
6	English Proficiency and Communication Skills	-	-	2	1	English	Humanities
7	Physical Fitness, Sports & Games – I	-	-	3	1	Binary grade	Binary grade
8	Constitution of India	-	2	-	1	T&P	Binary grade
Total		13	6	13	22	-	
Total		32			22	-	

I Year II Semester

S. No.	Course Title	L	T	P	C	Offering Department	Remarks
1	Algebra	3	2	-	4	Mathematics	Basic Sciences
2	Discrete Mathematical Structures	3	2	-	4	CSE	Basic Sciences
3	Engineering Graphics	2	-	2	3	Mechanical	Basic Engineering
4	Problem Solving through Programming II	1	2	2	3	CSE	Professional Core
5	Technical English Communication	2	-	2	3	English	Humanities
6	Numerical Methods	3	2	-	4	Mathematics	Basic Sciences
7	Physical Fitness, Sports & Games – II	-	-	3	1	Binary grade	Binary grade
8	Orientation Session	-	-	6	3	Binary grade	Binary grade
Total		14	8	15	25	-	
Total		37			25	-	

II Year I Semester

Sl. No.	Course Title	L	T	P	C	Offering Department	Remarks
1	Probability and Statistics	3	-	2	4	Statistics	Basic Sciences
2	Data Structures	2	2	2	4	T&P	Basic Engineering
3	Management Science	2	2	-	3	Management Studies	Humanities
4	Digital Logic Design	2	2	-	3	CSE	Professional core
5	Object-Oriented Programming through JAVA	2	-	2	3	CSE	Professional core
6	Database Management Systems	2	2	2	4	CSE	Professional core
7	Environmental Studies	2	1	-	2	Basic Sciences	Basic Sciences
8	Life Skills	-	-	2	1	Binary grade	Binary grade
Total		15	9	10	24	-	
9	NCC/ NSS/ SAC/ E-cell/ Student Mentoring/ Social activities/ Publication with good impact factor (Only 2 students can claim 1 paper/patent). These credits maybe earned on or before the end of IV semester	-	-	-	1	Floating credits Binary grade	Floating credits Binary grade
Total		34		25		-	

II Year II Semester

Sl. No.	Course Title	L	T	P	C	Offering Department	Remarks
1	Professional Communication	-	-	2	1	English	Humanities
2	Coding Competency (Advanced)	-	-	2	1	T&P	Basic Engineering
3	Design and Analysis of Algorithms	2	2	2	4	CSE	Professional core
4	Computer Organization and Architecture	2	2	-	3	CSE	Professional core
5	Theory of Computation	3	2	-	4	CSE	Professional core
6	Operating Systems	2	-	2	3	CSE	Professional core
7	Open Elective – 1	3	-	-	3	-	Open Elective
8	Life Skills	-	-	2	1	Binary grade	Binary grade
Total		12	6	10	20	-	

9	Minor / Honors – 1	3	-	2	4	-	
	Total	15	6	12	24		
	Total	33			24	-	

III Year I Semester

Sl. No.	Course Title	L	T	P	C	Offering Department	Remarks
1	Soft Skills Lab	-	-	2	1	T&P	Humanities
2	Web Technologies	2	-	2	3	CSE	Professional core
3	Artificial Intelligence	2	2	-	3	CSE	Professional core
4	Compiler Design	2	2	-	3	CSE	Professional core
5	Department Elective – 1	3	-	2	4	CSE	Department Elective
6	Open Elective – 2	3	-	-	3	-	Open Elective
7	Industry interface course (Modular course)	1	-	-	1	Binary Grades	Binary Grades
8	Inter-disciplinary Project – Phase I	-	-	2	-	CSE	Project
	Total	13	4	8	18	-	
9	NCC/ NSS/ SAC/ E-cell/ Student Mentoring/ Social activities/ Publication with good impact factor (Only 2 students can claim 1 paper/patent). These credits maybe earned on or before the end of VI semester	-	-	-	1	Floating credits Binary grade	Floating credits Binary grade
10	Minor / Honors – 2	3	-	2	4	-	
	Total	16	4	10	23	-	
	Total	30			23	-	

III Year II Semester

Sl. No.	Course Title	L	T	P	C	Offering Department	Remarks
1	Quantitative Aptitude & Logical Reasoning	1	2	-	2	T&P	Humanities
2	Software Engineering	2	-	2	3	CSE	Professional core

3	Computer Networks	3	-	2	4	CSE	Professional core
4	Data Mining Techniques	2	-	2	3	CSE	Professional core
5	Department Elective – 2	3	-	2	4	CSE	Department Elective
6	Open Elective – 3	3	-	-	3	-	Open Elective
7	Inter-Disciplinary Project – Phase II /	-	-	2	2	Project	Project
	Total	14	2	10	21	-	
8	Minor / Honors – 3	3	-	2	4	-	
	Total	17	2	12	25	-	
	Total		31		25	-	

IV Year I Semester

Sl. No.	Course Title	L	T	P	C	Offering Department	Remarks
1	Cryptography and Network Security	2	-	2	3	CSE	Professional core
2	Cloud Computing	2	-	2	3	CSE	Professional core
3	Big Data Analytics	2	-	2	3	CSE	Professional core
4	Department Elective – 3	3	-	2	4	CSE	Department Elective
5	Department Elective – 4	3	-	2	4	CSE	Department Elective
	Total	12	-	10	17	-	
6	Minor / Honors – 4	3	-	2	4	-	
	Total	15	-	12	21	-	
	Total		27		21	-	

IV Year II Semester

Sl. No.	Course Title	L	T	P	C	Offering Department	Remarks
1	Project Work	-	2	22	12	CSE	Project
	Total	-	2	22	12	-	
2	Minor / Honors – 5 (for project)	-	2	6	4	Theory course may be also offered	

	Total	-	4	28	16	-	
	Total		32		16	-	

Department Electives

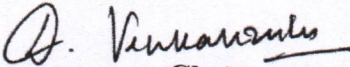
Sl. No.	Course Title	L	T	P	C	Pre-Requisite Knowledge
1	Mobile Application Development	2	-	4	4	OOPTJ
2	Advanced JAVA Programming	2	2	2	4	OOPTJ
3	Advanced Data Structures	2	2	2	4	DS
4	Web and Database Security	3	-	2	4	DBMS
5	Operating System Design	3	-	2	4	OS
6	Computer Graphics	2	2	2	4	P&S
7	Digital Image Processing	3	-	2	4	P&S
8	Machine Learning	3	-	2	4	P&S
9	Optimization Techniques	3	-	2	4	P&S
10	Digital Forensics	3	-	2	4	LAODE
11	Simulation & Modeling	3	-	2	4	CNS
12	Mobile Ad-hoc Networks	3	-	2	4	-
13	Deep Learning	3	-	2	4	CN
14	Parallel and Distributed Computing	3	2	-	4	ML
15	Numerical Algorithms	3	2	-	4	OS
16	Text Mining	3	-	2	4	C, OOPTJ
17	Intrusion Detection and Prevention System	3	-	2	4	FLAT
						CNS

Open Electives offered to non-computers

Sl.No	Course Title	L	T	P	C
1	Python Programming	2	-	2	3
2	OOPS through JAVA	2	-	2	3
3	Database Management Systems	2	-	2	3
4	Web Technologies	2	-	2	3
5	Mobile Application Development	2	-	2	3

Honours for CSE

Sl.No	Course Title	L	T	P	C
1	Student can opt any four courses from department electives which he/she did not pursue under department elective courses.	3	-	2	4
2		3	-	2	4
3		3	-	2	4
4		3	-	2	4
5		3	-	2	4
5	Capstone Project / Any other Course	-	2	6	4


Chairperson



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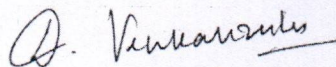
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

APPENDIX II

List of Courses that Enables Employability or Entrepreneurship or Skill Development

S. No.	Year and Semester	Course Title	Employability / Entrepreneurship / Skill development
1.	I Year I Semester	Engineering Chemistry	Skill development
2.	I Year I Semester	Problem Solving through Programming I	Skill development
3.	I Year I Semester	English Proficiency and Communication Skills	Employability
4.	I Year II Semester	Problem Solving through Programming II	Skill development
5.	I Year II Semester	Technical English Communication	Employability
6.	I Year II Semester	Numerical Methods	Skill development
7.	II Year I Semester	Data Structures	Skill development
8.	II Year I Semester	Management Science	Entrepreneurship
9.	II Year I Semester	Object-Oriented Programming through JAVA	Skill development
10.	II Year I Semester	Database Management Systems	Skill development
11.	II Year II Semester	Advanced Coding Competency	Skill development
12.	II Year II Semester	Design and Analysis of Algorithms	Skill development
13.	II Year II Semester	Computer Organization & Architecture	Skill development
14.	II Year II Semester	Theory of Computation	Skill development
15.	II Year II Semester	Operating Systems	Skill development
16.	III Year I Semester	Web Technologies	Employability
17.	III Year I Semester	Introduction to Artificial Intelligence	Skill development
18.	III Year I Semester	Compiler Design	Skill development
19.	III Year I Semester	Industry interface course (Modular course)	Employability
20.	III Year II Semester	Software Engineering	Entrepreneurship
21.	III Year II Semester	Computer Networks	Skill development
22.	III Year II Semester	Data Mining Techniques	Skill development
23.	III Year II Semester	Inter-Disciplinary Project	Employability/ Entrepreneurship
24.	IV Year I Semester	Cryptography and Network Security	Employability/ Skill development

25.	IV Year I Semester	Cloud Computing	Employability/ Skill development
26.	IV Year I Semester	Big Data Analytics	Employability/ Skill development
27.	IV Year II Semester	Project Work	Employability/ Entrepreneurship
28.	Dept Elective	Mobile Application Development	Skill development/ Employability
29.	Dept Elective	Advanced JAVA Programming	Skill development/ Employability
30.	Dept Elective	Advanced Data Structures	Skill development
31.	Dept Elective	Operating System Design	Skill development/ Employability
32.	Dept Elective	Computer Graphics	Skill development
33.	Dept Elective	Advanced Graph Algorithms	Skill development
34.	Dept Elective	Digital Image Processing	Skill development
35.	Dept Elective	Machine Learning	Employability
36.	Dept Elective	Optimization Techniques	Skill development
37.	Dept Elective	Simulation & Modeling	Skill development
38.	Dept Elective	Mobile Ad-hoc Networks	Skill development
39.	Dept Elective	Deep Learning	Skill development
40.	Dept Elective	Cyber Security and Cyber Laws	Employability
41.	Dept Elective	Parallel and Distributed Computing	Skill development
42.	Dept Elective	Numerical Algorithms	Skill development
43.	Dept Elective	Wireless Sensor Networks	Employability
44.	Dept Elective	Internet of Things	Employability
45.	Dept Elective	Text Mining	Employability
46.	Dept Elective	Biometrics	Employability


Chairperson

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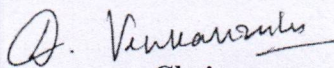
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**APPENDIX III****List of New Courses in the R22 Curriculum**

S. No.	Year and Semester	Course Title	Employability / Entrepreneurship / Skill development
1.	I Year I Semester	Linear Algebra & Ordinary Differential Equations	Skill development
2.	I Year I Semester	Semiconductor Physics & Electromagnetics	Skill development
3.	I Year I Semester	Engineering Chemistry	Skill development
4.	I Year I Semester	Problem Solving through Programming I	Skill development
5.	I Year II Semester	Algebra	Skill development
6.	I Year II Semester	Engineering Graphics	Employability
7.	I Year II Semester	Problem Solving through Programming II	Skill development
8.	I Year II Semester	Discrete Mathematical Structures	Skill development
9.	II Year I Semester	Management Science	Employability / Entrepreneurship
10.	II Year II Semester	Advanced Coding Competency	Skill development
11.	II Year II Semester	Theory of Computation	Skill development
12.	III Year II Semester	Computer Networks	Employability / Entrepreneurship
13.	IV Year I Semester	Cloud Computing	Employability
14.	Dept. Elective	Advanced JAVA Programming	Skill development/ Employability
15.	Dept. Elective	Operating System Design	Skill development/ Employability
16.	Dept. Elective	Computer Graphics	Skill development
17.	Dept. Elective	Advanced Graph Algorithms	Skill development
18.	Dept. Elective	Simulation & Modeling	Skill development
19.	Dept. Elective	Parallel and Distributed Computing	Skill development
20.	Dept. Elective	Numerical Algorithms	Skill development
21.	Dept. Elective	Text Mining	Employability
22.	Minor CSE stream	Introduction to Python Programming	Skill development
23.	Minor CSE stream	OOPS through JAVA	Skill development

24.	Minor CSE stream	Database Management Systems	Skill development/ Employability
25.	Minor CSE stream	Web Technologies	Employability
26.	Minor CSE stream	Mobile Application Development	Employability
27.	Minor CSE stream	Design and Analysis of Algorithms	Skill development
28.	Minor CSE stream	Operating Systems and Shell Programming	Skill development
29.	Minor CSE stream	Computer Networks	Skill development
30.	Minor AIML stream	Artificial Intelligence	Skill Development
31.	Minor AIML stream	Computer Vision	Skill Development
32.	Minor AIML stream	Data Wrangling & Visualization	Skill Development
33.	Minor AIML stream	Deep Learning	Skill Development
34.	Minor AIML stream	Digital Image Processing	Skill Development
35.	Minor AIML stream	Machine Learning	Skill Development
36.	Minor AIML stream	Introduction to Python Programming	Skill Development
37.	Minor AIML stream	Text Mining	Skill Development
38.	Minor AIML stream	Industry 5.0	Skill Development
39.	Minor CS stream	Introduction to Block chain Technology	Skill Development
40.	Minor CS stream	Introduction to Digital Forensics	Skill Development
41.	Minor CS stream	Fundamentals of Security	Skill Development
42.	Minor CS stream	Fundamentals of Cryptography	Skill Development
43.	Minor CS stream	Tools and Techniques for Ethical Hacking	Skill Development
44.	Minor CS stream	Network Security	Skill Development
45.	Minor DS stream	Big Data Analytics	Skill Development
46.	Minor DS stream	Data Science Using Python	Skill Development
47.	Minor DS stream	Introduction to Python Programming	Skill Development
48.	Minor DS stream	Statistical Methods and Data Visualization	Skill Development
49.	Minor DS stream	Machine Learning	Skill Development
50.	Open Elective	Database Systems	Employability
51.	Open Elective	Mobile Application Design and Development	Employability
52.	Open Elective	Java Programming	Skill Development/ Employability
53.	Open Elective	Python Programming	Skill Development/ Employability
54.	Open Elective	Design and Development of Internet Applications	Employability


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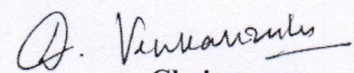
-Estd. u/s 3 of UGC Act 1956

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

APPENDIX IV

Comparison of Course Contents between R21 and R22 Curriculums

S. No.	Year and Semester	Course Title	% of Change
1.	I Year II Semester	Programming for Problem Solving	20
2.	II Year I Semester	Digital Logic Design	5
3.	II Year I Semester	Object-Oriented Programming through JAVA	10
4.	II Year I Semester	Database Management Systems	5
5.	II Year II Semester	Design and Analysis of Algorithms	5
6.	II Year II Semester	Computer Organization and Architecture	20
7.	II Year II Semester	Operating Systems	15
8.	III Year I Semester	Web Technologies	2
9.	III Year I Semester	Artificial Intelligence	5
10.	III Year I Semester	Compiler Design	10
11.	III Year II Semester	Software Engineering	15
12.	III Year II Semester	Data Mining Techniques	5
13.	IV Year I Semester	Cryptography and Network Security	5
14.	IV Year I Semester	Big Data Analytics	5
15.	Dept. Elective	Mobile Application Development	5
16.	Dept. Elective	Advanced Data Structures	20
17.	Dept. Elective	Fundamentals of Image Processing	10
18.	Dept. Elective	Machine Learning	5
19.	Dept. Elective	Optimization Techniques	10
20.	Dept. Elective	Mobile Ad-hoc Networks	5
21.	Dept. Elective	Deep Learning	15
22.	Dept. Elective	Cyber Security and Cyber Laws	5
23.	Dept. Elective	Wireless Sensor Networks	30
24.	Dept. Elective	Internet of Things	5
25.	Dept. Elective	Biometrics	5


Chairperson