

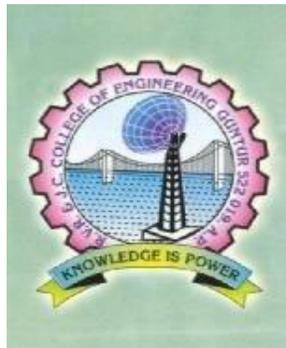
# **R.V.R. & J.C.COLLEGE OF ENGINEERING**

(Autonomous)

**Regulations (R-20)**

**Scheme of Instruction, Examinations and syllabus for  
Four year B.Tech. Degree Programme**

**(w.e.f. 2021-2022)**



## **Computer Science & Engineering (IoT)**

**RVR & JC College of Engineering**  
**Department of Computer Science & Engineering (Internet of Things)**  
**R20 Regulations B.Tech.CSE(IoT)**

**Semester - I (First Year)**

S.No	Course Code	Course Title	Hours Per Week		Scheme of Examination			Category
			L	P	Internal Marks	Sem End Exam Marks	Credits	
1	CO/CS/IT/CM/CD 111	Mathematics – I	3	0	30	70	3	BS
2	CO/CM/CD 112	Engineering Chemistry	3	0	30	70	3	BS
3	CO/CM/CD 113	English for Communication Skills	3	0	30	70	3	HS
4	CO/CM/CD/CB 114	Fundamentals of Computer Science	3	0	30	70	3	PC
5	CO/CM/CD 151	Engineering Chemistry Lab	0	3	30	70	1.5	BS
6	CO/CM/CD 152	English Language Communication Skills Lab	0	3	30	70	1.5	HS
7	CO/CS/IT/CM/CD/CB 153	Engineering Graphics and Design Lab	1	4	30	70	3	ES
8	CO/CS/IT/CM/CD 154	Fundamentals of Computer Science Lab	0	3	30	70	1.5	PC
9	CO/CM/CD MC1	Environmental Science	2	0	100	-	-	MC
10		Three Weeks Orientation Program	-	-	-	-	-	
<b>TOTAL</b>			<b>15</b>	<b>13</b>	<b>340</b>	<b>560</b>	<b>19.5</b>	

Category	CREDITS
Basic Science Courses	7.5
Engineering Science Courses	12
<b>TOTAL CREDITS</b>	<b>19.5</b>

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**Semester - II (First Year)**

S.No	Course Code	Course Title	Hours Per Week		Scheme of Examination			Category
			L	P	Internal Marks	Sem End Exam Marks	Credits	
1	CO/CS/IT/CM 121	Mathematics – II	3	0	30	70	3	BS
2	CO/CM/CD 122	Engineering Physics	3	0	30	70	3	BS
3	CO 123	Basic Electrical & Electronics Engineering	3	0	30	70	3	ES
4	CO/CB/CM/CD 124	Data Structures & Algorithms	3	0	30	70	3	PC
5	CO/CS/IT/CM 125	Programming in Python	2	0	30	70	2	PC
6	CO/CM/CD 161	Engineering Physics Lab	0	3	30	70	1.5	BS
7	CO 162	Basic Electrical & Electronics Engineering Lab	0	3	30	70	1	HS
8	CO/CB/CM/CD 163	Data Structures & Algorithms Lab	0	3	30	70	1.5	PC
9	CO/CS/IT/CM 164	Programming in Python Lab	0	2	30	70	1.5	PC
10	CO/CD/CM MC2	Constitution of India	2	0	100	-	-	MC
<b>TOTAL</b>			<b>16</b>	<b>11</b>	<b>370</b>	<b>630</b>	<b>19.5</b>	

Category	CREDITS
Basic Science Courses	7.5
Engineering Science Courses	7.5
Humanities and Social Science Courses	4.5
<b>TOTAL CREDITS</b>	<b>19.5</b>

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**Semester - III (Second Year)**

S.No	Course Code	Course Title	Hours Per Week		Scheme of Examination			Category
			L	P	Internal Marks	Sem End Exam Marks	Credits	
1	CO 211	Digital Electronics	3	0	30	70	3	ES
2	CO/CS/CM/IT/CD 212	Discrete Mathematics	3	0	30	70	3	ES
3	CO 213	Computer Organization & Micro Processors	3	0	30	70	3	PC
4	CO 214	Fundamentals of Internet of Things	3	0	30	70	3	PC
5	CO/CS/CM/IT/CD 215	Object Oriented Programming	3	0	30	70	3	PC
6	CO 251	Technical Communication & Value Science Lab	0	3	30	70	1.5	ES
7	CO 252	Fundamentals to Internet of Things Lab	0	3	30	70	1.5	PC
8	CO/CS/CM/IT/CD 253	Object Oriented Programming Lab	0	3	30	70	1.5	PC
9	COSL1	<b>Web Development</b> (Skill Oriented Course – I)	1	2	100	-	2	SC
10	CO/CM/CS/IT/CD MC3	Design Thinking & Product Innovation	2	0	100	-	-	MC
<b>TOTAL</b>			<b>18</b>	<b>11</b>	<b>440</b>	<b>560</b>	<b>21.5</b>	

Category	CREDITS
Basic Science Course	3
Professional Core Courses	16.5
Skill Oriented Basic Course	2
<b>TOTAL CREDITS</b>	<b>21.5</b>

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**Semester - IV (Second Year)**

S.No	Course Code	Course Title	Hours Per Week		Scheme of Examination			Category
			L	P	Internal Marks	Sem End Exam Marks	Credits	
1	CO 221	Probability & Statistics	3	0	30	70	3	BS
2	CO/CS/IT/CD 222	Database Management Systems	3	0	30	70	3	PC
3	CO/CS/IT/CM 223	Operating Systems	3	0	30	70	3	PC
4	CO 224	IoT Architecture & Protocols	3	0	30	70	3	PC
5	CO 225	Computer Networks	3	0	30	70	3	PC
6	CO 261	Probability & Statistics Lab	0	3	30	70	1.5	BS
7	CO/CS/IT/CD 262	Database Management Systems Lab	0	3	30	70	1.5	PC
8	CO 263	Operating Systems Lab	0	3	30	70	1.5	PC
9	COSL2	<b>Scripting Languages</b> (Skill Oriented Course – II)	1	2	100	-	2	SC
10	CO/CS/IT/CM/CD MC4	Ethics & Human Values	2	0	100	-	-	MC
<b>TOTAL</b>			<b>18</b>	<b>11</b>	<b>440</b>	<b>560</b>	<b>21.5</b>	
<b>Internship of Minimum 6 Weeks is mandatory during Summer Vacation (Will be evaluated in Fifth Semester)</b>								
<b>**Registration for Honors/Minor degree permitted in this semester (Maximum Two additional courses are permitted per semester for Honors/Minor**</b>								

Category	CREDITS
Basic Science Course	3
Professional Core Courses	16.5
Skill Oriented Basic Course	2
<b>TOTAL CREDITS</b>	<b>21.5</b>

## RVR & JC College of Engineering

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### Semester- V (Third Year)

S.No	Course Code	Course Title	Hours Per Week		Scheme of Examination			Category
			L	P	Internal Marks	Sem End Exam Marks	Credits	
1	CO/CS/IT/CM 311	Automata Theory & Formal Languages	3	0	30	70	3	PC
2	CO 312	Software Engineering	3	0	30	70	3	PC
3	CO/CS/IT 313	Design And Analysis of Algorithms	3	0	30	70	3	PC
4	CO 314- COEL01	<b>IoT with Cloud Computing</b> (Professional Elective – I)	3	0	30	70	3	PE
5	CO 315- JOEL24	<b>Artificial Intelligence</b> (Job-Oriented Elective – I)	3	0	30	70	3	OE
6	CO 351	Software Computing Lab	0	3	30	70	1.5	PC
7	CO 352	<b>IoT with Cloud Computing Lab</b> (Professional Elective Lab)	0	3	30	70	1.5	PE
8	CO/CS/IT/CM/CB 353	Summer Internship	-	-	100	-	1.5	PR
9	COSL3	<b>Soft Skills</b> (Skill Oriented Course – III)	1	2	100	-	2	SC
<b>TOTAL</b>			<b>16</b>	<b>8</b>	<b>410</b>	<b>490</b>	<b>21.5</b>	

Category	CREDITS
Professional Core Courses	12
Professional Elective Course	3
Open Elective Course/Job Oriented Elective	3
Soft Skills- Skill Oriented Course*	2
Summer Internship	1.5
<b>TOTAL CREDITS</b>	<b>21.5</b>

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**Semester- VI (Third Year)**

S.No	Course Code	Course Title	Hours Per Week		Scheme of Examination			Category
			L	P	Internal Marks	Sem End Exam Marks	Credits	
1	CO 321	Wireless Sensor Networks	3	0	30	70	3	PC
2	CO/CB 322	Compiler Design	3	0	30	70	3	PC
3	CO 323	Industrial IoT	3	0	30	70	3	PC
4	CO 324	Professional Elective – II	3	0	30	70	3	PE
5	CO 325	Open/Job-Oriented Elective – II	3	0	30	70	3	OE
6	CO 361	Wireless Sensor Networks Lab	0	3	30	70	1.5	PC
7	CO 362	Industrial IoT Lab	0	3	30	70	1.5	PC
8	CO/CS/IT/CM 363	Term Paper / Seminar	0	3	100	-	1.5	PR
9	COSL4	Skill Oriented Course – IV	1	2	100	-	2	SC
<b>TOTAL</b>			<b>16</b>	<b>11</b>	<b>410</b>	<b>490</b>	<b>21.5</b>	
<b>Internship minimum of 6 weeks is mandatory during summer vacation.(Will be evaluated in Seventh Semester)</b>								

Category	CREDITS
Professional Core Courses	12
Professional Elective Course	3
Open Elective Course/Job Oriented Elective	3
Skill Advanced Course	2
Project/Term Paper	1.5
<b>TOTAL CREDITS</b>	<b>21.5</b>

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**Semester -VII (Fourth Year)**

S.No	Course Code	Course Title	Hours Per Week		Scheme of Examination			Category
			L	P	Internal Marks	Sem End Exam Marks	Credits	
1	CO 411	Humanities & Social Sciences Elective	3	0	30	70	3	HS
2	CO 412	Professional Elective – III	3	0	30	70	3	PE
3	CO 413	Professional Elective – IV	3	0	30	70	3	PE
4	CO 414	Professional Elective – V (MOOCS)	0	0	-	100	3	PE
5	CO 415	Open/Job-Oriented Elective – III	3	0	30	70	3	OE
6	CO 416	Open Elective – IV (MOOCS)	0	0	-	100	3	OE
7	CO 451	Industrial Internship / Professional Certification	-	-	100	-	3	PR
8	COSL5	Skill Oriented Course – V	1	2	100	-	2	SC
<b>TOTAL</b>			<b>13</b>	<b>2</b>	<b>320</b>	<b>480</b>	<b>23</b>	

Category	CREDITS
Professional Elective Courses	9
Open Elective Course/Job Oriented Elective	3
Humanities And Social Science Elective	6
Skill Advanced Course	2
Industrial/Research Internship	3
<b>TOTAL CREDITS</b>	<b>23</b>

**Semester - VIII (Fourth Year)**

S.No	Course Code	Course Title	Hours Per Week		Scheme of Examination			Category Code
			L	P	Internal Marks	Sem End Exam Marks	Credits	
1	CO 461	Project Work (Project Work, Seminar and Internship)	0	12	30	70	12	PR
<b>TOTAL</b>			<b>0</b>	<b>12</b>	<b>30</b>	<b>70</b>	<b>12</b>	

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<b>Professional Elective Courses</b>				
S.NO	COURSE CODE	COURSE NAME	L-T-P	CR
<b>III/IV B.Tech. ( V<sup>th</sup> Sem)</b>				
<b>CO 314</b>				
1.	COEL01	IoT with Cloud Computing	3-0-0	3
2.	COEL02	Introduction to Cyber Security	3-0-0	3
3.	COEL03	Distributed Systems	3-0-0	3
4.	COEL04	Digital Image Processing	3-0-0	3
<b>III/IV B.Tech. (VI<sup>th</sup> Sem)</b>				
<b>CO 324</b>				
1.	COEL05	Data Science for IoT	3-0-0	3
2.	COEL06	Cryptography & Network Security	3-0-0	3
3.	COEL07	Business Intelligence & Analytics	3-0-0	3
4.	COEL08	Ethical Hacking	3-0-0	3
<b>IV/IV B.Tech. (VII<sup>th</sup> Sem)</b>				
<b>CO 412</b>				
1.	COEL09	Neural Networks	3-0-0	3
2.	COEL10	Privacy and Security for IoT	3-0-0	3
3.	COEL11	Software Testing Tools	3-0-0	3
4.	COEL12	Augmented and Virtual Reality	3-0-0	3
<b>IV/IV B.Tech. (VII<sup>th</sup> Sem)</b>				
<b>CO 413</b>				
1.	COEL13	Optimization Techniques	3-0-0	3
2.	COEL14	Big Data Analytics	3-0-0	3
3.	COEL15	Block Chain Technologies	3-0-0	3
4.	COEL16	Deep Learning	3-0-0	3

## RVR & JC College of Engineering

Department of Computer Science & Engineering (Internet of Things)

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<b>Skill Oriented Courses</b>			
S.NO	COURSE NAME	L-T-P	CR
<b>Basic Skill Oriented Courses</b>			
<b>COSL1 Skill Oriented Course - I</b>			
a.	Web Development	1-0-2	2
b.	2D - Computer Animation	1-0-2	2
c.	Programming with C++	1-0-2	2
<b>COSL2 Skill Oriented Course - II</b>			
a.	Scripting Languages	1-0-2	2
c.	UNIX Programming	1-0-2	2
<b>COSL3 Skill Oriented Course - III</b>			
a.	Soft Skills	1-0-2	2
<b>Advanced Skill Oriented Courses</b>			
<b>COSL4 Skill Oriented Course - IV</b>			
a.	Mobile App Development	1-0-2	2
b.	Ethical Hacking	1-0-2	2
<b>COSL5 Skill Oriented Course - V</b>			
a.	Computer Vision	1-0-2	2
b.	Numpy & Pandas	1-0-2	2

### Courses offered for Minor in Computer Science & Engineering (IoT)

S.NO	COURSE CODE	COURSE NAME	L-T-P	CR
1.	COMR1	Introduction to IoT	4-0-0	4
2.	COMR2	IoT Architecture & Protocols	4-0-0	4
3.	COMR3	IoT Cloud and Data Analytics	4-0-0	4
4.	COMR4	Smart Sensor Technologies	4-0-0	4
<ul style="list-style-type: none"> <li>• 2 courses to complete through MOOCs with the acceptance of CSE(IoT) BoS</li> </ul>				

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**Job Oriented Elective Courses (offered to all branches)**

S.No	COURSE CODE	COURSE NAME
1	JOEL09	Interface and Programming with IoT Gateway
2	JOEL10	IoT cloud and Data Analytics
3	JOEL19	Embedded Systems-1
4	JOEL22	Machine Learning
5	JOEL24	Artificial Intelligence

**Humanities & Social Sciences Elective for CSE(IoT)**

S.No	COURSE CODE	COURSE NAME
<b>CO 411</b>		
1	HSEL01	Introduction to Industrial Management
2	HSEL02	Economics for Engineers
3	HSEL03	Human resources Behavior & Organizational Behavior
4	HSEL04	Industrial Management & Entrepreneurship
5	HSEL05	Project Management & Entrepreneurship