

**B.Tech. - Course Structure & Syllabus – RK24****INDUCTION PROGRAMME**

S.No.	Category	Course Name	L-T-P-C
1	MC	Physical Activities -- Sports, Yoga and Meditation, Plantation	0-0-6-0
2	MC	Career Counselling	2-0-2-0
3	MC	Orientation to all branches -- career options, tools, etc.	3-0-0-0
4	EC	Orientation on admitted Branch -- corresponding labs, tools and platforms	2-0-3-0
5	ES	Proficiency Modules & Productivity Tools	2-1-2-0
6	MC	Assessment on basic aptitude and mathematical skills	2-0-3-0
7	MC	Remedial Training in Foundation Courses	2-1-2-0
8	MC	Human Values & Professional Ethics	3-0-0-0
9	BS	Communication Skills -- focus on Listening, Speaking, Reading, Writing skills	2-1-2-0
10	ES	Concepts of Programming	2-0-2-0

**Group-A Branches:**

Computer Science and Engineering  
Computer Science and Engineering (Data Science)

**Group-B Branches:**

Civil Engineering,  
Electrical and Electronics Engineering,  
Mechanical Engineering  
Electronics and Communication Engineering,  
Artificial Intelligence and Machine Learning

**Course Code Format:**

Regulation	Branch	Year	Semester	Course Serial Number
2 Digits	2 Digits	1 Digit	1 Digit	2 Digits
24	01/02/03/04/05/44/61	1/2/3/4	1/2	01/02/03/04/...../19/20

**Branch Code:**

Code	Branch
01	Civil Engineering
02	Electrical & Electronics Engineering
03	Mechanical Engineering
04	Electronics and Communication Engineering
05	Computer Science and Engineering
44	Computer Science and Engineering (Data Science)
61	Artificial Intelligence and Machine Learning

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## B. Tech. – I Year I Semester (for Group-A Branches CSE and CSE-(DS))

S.No.	Course Code	Category	Title	L/D	T	P	Credits
1	24051101/ 24441101	BS & H	Engineering Chemistry	3	0	0	3
2	24051102/ 24441102	BS & H	Linear Algebra & Calculus	3	0	0	3
3	24051103/ 24441103	Engineering Science	Basic Civil & Mechanical Engineering	3	0	0	3
4	24051104/ 24441104	BS & H	Communicative English	2	0	0	2
5	24051105/ 24441105	Engineering Science	Introduction to Programming	3	0	0	3
6	24051106/ 24441106	BS & H	Engineering Chemistry Lab	0	0	2	1
7	24051107/ 24441107	Engineering Science	Engineering Workshop	0	0	3	1.5
8	24051108/ 24441108	BS & H	Communicative English Lab	0	0	2	1
9	24051109/ 24441109	Engineering Science	Computer Programming Lab	0	0	3	1.5
10	24051110/ 24441110	BS & H	Health and wellness, Yoga and Sports	-	-	1	0.5
Total				14	0	11	19.5

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## B.Tech. – I Year I Semester (for Group-B Branches CE, EEE, ME, ECE, and AI &amp; ML)

S.No.	Course Code	Category	Title	L/D	T	P	Credits
1	24011111/ 24021111/ 24031111/ 24041111/ 24611111	BS & H	Engineering Physics	3	0	0	3
2	24011112/ 24021112/ 24031112/ 24041112/ 24611112	BS & H	Linear Algebra & Calculus	3	0	0	3
3	24011113/ 24021113/ 24031113/ 24041113/ 24611113	Engineering Science	Basic Electrical & Electronics Engineering	3	0	0	3
4	24011114/ 24021114/ 24031114/ 24041114/ 24611114	Engineering Science	Engineering Drawing	1	0	4	3
5	24011115/ 24021115/ 24031115/ 24041115/ 24611115	Engineering Science	Introduction to Programming	3	0	0	3
6	24011116/ 24021116/ 24031116/ 24041116/ 24611116	BS & H	Engineering Physics Lab	0	0	2	1
7	24011117/ 24021117/ 24031117/ 24041117/ 24611117	Engineering Science	Electrical & Electronics Engineering Workshop	0	0	3	1.5
8	24011118/ 24021118/ 24031118/ 24041118/ 24611118	Engineering Science	IT Workshop	0	0	2	1
9	24011119/ 24021119/ 24031119/ 24041119/ 24611119	Engineering Science	Computer Programming Lab	0	0	3	1.5
10	24011120/ 24021120/ 24031120/ 24041120/ 24611120		NSS / NCC / Scouts & Guides / Community Service	-	-	1	0.5
Total				13		15	20.5

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## B.Tech. – I Year II Semester (for Group-A Branches CSE and CSE-(DS))

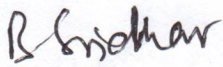
S.No.	Course Code	Category	Title	L/D	T	P	Credits
1	24051201/ 24441201	BS & H	Engineering Physics	3	0	0	3
2	24051202/ 24441202	BS & H	Differential Equations & Vector Calculus	3	0	0	3
3	24051203/ 24441203	Engineering Science	Basic Electrical & Electronics Engineering	3	0	0	3
4	24051204/ 24441204	Engineering Science	Engineering Drawing	1	0	3	4
5	24051205/ 24441205	Professional Core	Data structures	3	0	0	3
6	24051206/ 24441206	BS & H	Engineering Physics Lab	0	0	2	1
7	24051207/ 24441207	Engineering Science	Electrical & Electronics Engineering Workshop	0	0	3	1.5
8	24051208/ 24441208	Engineering Science	IT Workshop	0	0	2	1
9	24051209/ 24441209	Professional Core	Data structures Lab	0	0	3	1.5
10	24051210/ 24441210		NSS/NCC/Scouts & Guides/Community Service	-	-	1	0.5
Total				13	0	15	20.5

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## B.Tech. – I Year II Semester (for Group-B Branches CE, EEE, ME, ECE, and AI &amp; ML)

S.No.	Course Code	Category	Title	L/D	T	P	Credits
1	24011211/ 24021211/ 24031211/ 24041211/ 24611211	BS & H	Engineering Chemistry	3	0	0	3
2	24011212/ 24021212/ 24031212/ 24041212/ 24611212	BS & H	Differential Equations & Vector Calculus	3	0	0	3
3	24011213/ 24021213/ 24031213/ 24041213/ 24611213	Engineering Science	Basic Civil & Mechanical Engineering	3	0	0	3
4	24011214/ 24021214/ 24031214/ 24041214/ 24611214	BS & H	Communicative English	2	0	0	2
5	24011215/ 24031215 24021215 24041215 24611215	Professional Core	Engineering Mechanics Electrical Circuit Analysis – I Network Analysis Data structures	3	0	0	3
6	24011216/ 24021216/ 24031216/ 24041216/ 24611216	BS & H	Engineering Chemistry Lab	0	0	2	1
7	24011217/ 24021217/ 24031217/ 24041217/ 24611217	Engineering Science	Engineering Workshop	0	0	3	1.5
8	24011218/ 24021218/ 24031218/ 24041218/ 24611218	BS & H	Communicative English Lab	0	0	2	1
9	24011219/ 24031219 24021219 24041219 24611219	Professional Core	Engineering Mechanics Lab Electrical Circuits Lab Network Analysis Lab Data structures Lab	0	0	3	1.5
10	24011220/ 24021220/ 24031220/ 24041220/ 24611220	BS & H	Health and wellness, Yoga and Sports	-	-	1	0.5
<b>Total</b>				<b>14</b>	<b>0</b>	<b>11</b>	<b>19.5</b>

  
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## B. Tech. – II Year I Semester

S.No.	Course Code	Category	Title	L	T	P	Credits
1	24012101	BS&H	Engineering Mathematics (Branch specific)	3	0	0	3
2	24012102	BS&H	Universal Human Values – Understanding Harmony	2	1	0	3
3	24012103	Engineering Science		2	0	0	2
4	24012104	Professional Core		3	0	0	3
5	24012105	Professional Core		3	0	0	3
6	24012106	Engineering Science		0	0	2	1
7	24012107	Professional Core		0	0	3	1.5
8	24012108	Professional Core		0	0	3	1.5
9	24012109	Skill Enhancement course		0	1	2	2
10	24012110	Audit Course	Environmental Science	2	0	0	-
Total				15	2	10	20

## B. Tech. – II Year II Semester

S.No.	Course Code	Category	Title	L	T	P	Credits
1	24012201	Management Course - I		2	0	0	2
2	24012202	Engineering Science		3	0	0	3
3	24012203	Professional Core		3	0	0	3
4	24012204	Professional Core		3	0	0	3
5	24012205	Professional Core		3	0	0	3
6	24012206	Professional Core		0	0	2	1
7	24012207	Professional Core		0	0	3	1.5
8	24012208	Professional Core		0	0	3	1.5
9	24012209	Skill Enhancement course		0	1	2	2
10	24012210	BS&H	Design Thinking & Innovation	1	0	2	2
Total				15	1	12	22
Mandatory Community Service Project Internship of 08 weeks duration during summer vacation							

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## B.Tech. – III Year I Semester

S.No.	Course Code	Category	Title	L	T	P	Credits
1	24013101	Professional Core		3	0	0	3
2	24013102	Professional Core		3	0	0	3
3	24013103	Professional Elective - I		2	0	0	2
4	24013104	Open Elective - I		3	0	0	3
5	24013105	Open Elective - II		3	0	0	3
6	24013106	Professional Core		0	0	3	1.5
7	24013107	Professional Core		0	0	3	1.5
8	24013108	Skill Enhancement course		0	1	2	2
9	24013109	BS&H	Tinkering Lab	0	0	2	1
10	24013110	Evaluation of Community Service Internship		-	-	-	2
Total				14	1	10	22

## B.Tech. – III Year II Semester

S.No.	Course Code	Category	Title	L	T	P	Credits
1	24013201	Professional Core		3	0	0	3
2	24013202	Professional Core		3	0	0	3
3	24013203	Professional Core		3	0	0	3
4	24013204	Professional Elective - II		3	0	0	3
5	24013205	Professional Elective - III		2	0	0	2
6	24013206	Open Elective - III		3	0	0	3
7	24013207	Professional Core		0	0	2	1
8	24013208	Professional Core		0	0	2	1
9	24013209	Skill Enhancement course		0	1	2	2
10	24013210	Audit Course	Technical Paper Writing & IPR	2	0	0	-
Total				19	1	06	21
Mandatory Industry Internship of 08 weeks duration during summer vacation							

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## B.Tech. – IV Year I Semester

S.No.	Course Code	Category	Title	L	T	P	Credits
1	24014101	Professional Core		3	0	0	3
2	24014102	Professional Core		3	0	0	3
3	24014103	Management Course - II		2	0	0	2
4	24014104	Professional Elective - IV		3	0	0	3
5	24014105	Professional Elective - V		3	0	0	3
6	24014106	Open Elective - IV		3	0	0	3
7	24014107	Professional Core		0	0	2	1
8	24014108	Professional Core		0	0	2	1
9	24014109	Skill Enhancement Course		0	1	2	2
10	24014110	Audit Course	Constitution of India	2	0	0	-
11	24014111	Internship	Evaluation of Industry Internship	-	-	-	2
Total				19	1	06	23

## B.Tech. – IV Year II Semester

S.No.	Course Code	Category	Title	L	T	P	Credits
1	24014201	Project Work	Full semester Project Work	0	0	12	6
2	24014202	Internship	Full semester Internship	0	0	12	6
Total				0	0	24	12

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L/D	T	P	C
3	0	0	3

### BASIC CIVIL AND MECHANICAL ENGINEERING (Common to all Branches of Engineering)

#### Course Objectives:

- Familiarize students with the scope and importance of Civil Engineering subdivisions and their roles in society.
- Introduce preliminary concepts of surveying, transportation, and water resources in Civil Engineering.
- Provide an understanding of various engineering materials, manufacturing processes, and mechanical power transmission systems in Mechanical Engineering.
- Educate students on the basics of thermal engineering and robotics, including their principles and applications.

#### Course Outcomes: On completion of the course, the student should be able to:

CO1	Understand various sub-divisions of Civil Engineering and to appreciate their role in ensuring better society.
CO2	Know the concepts of surveying and Transportation and Understand the importance of Water Storage and Conveyance Structures.
CO3	Understand the Role of Mechanical Engineering, Engineering Materials and different manufacturing processes.
CO4	Explain the basics of robotics, thermal engineering power plants and Mechanical Power Transmission.

#### PART A: BASIC CIVIL ENGINEERING UNIT I

**Basics of Civil Engineering:** Role of Civil Engineers in Society- Various Disciplines of Civil Engineering- Structural Engineering- Geo-technical Engineering- Transportation Engineering - Hydraulics and Water Resources Engineering – Environmental Engineering-Scope of each discipline - Building Construction and Planning - Construction Materials-Cement - Aggregate - Bricks- Cement concrete- Steel. Introduction to Prefabricated construction Techniques.

#### UNIT II

**Surveying:** Objectives of Surveying- Horizontal Measurements – Angular Measurements- Introduction to Bearings Levelling instruments used for levelling - Simple problems on levelling and bearings-Contour mapping.

**Transportation Engineering:** Importance of Transportation in Nation's economic development- Types of Highway Pavements- Flexible Pavements and Rigid Pavements - Simple Differences. Basics of Harbour, Tunnel, Airport, and Railway Engineering.

**Water Resources and Environmental Engineering:** Introduction, Sources of water- Quality of water- Specifications- Introduction to Hydrology–Rainwater Harvesting-Water Storage and Conveyance Structures (Simple introduction to Dams and Reservoirs).

#### Textbooks:

1. Basic Civil Engineering, M.S.Palanisamy, Tata Mcgraw Hill publications (India) Pvt. Ltd. Fourth Edition.
2. Introduction to Civil Engineering, S. S. Bhavikatti, New Age International Publishers. 2022. First Edition.
3. Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, First Edition.

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**Reference Books:**

1. Surveying, Vol- I and Vol-II, S.K. Duggal, Tata McGraw Hill Publishers 2019. Fifth Edition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers, Delhi. 2016
3. Irrigation Engineering and Hydraulic Structures - Santosh Kumar Garg, Khanna Publishers, Delhi 2023. 38th Edition.
4. Highway Engineering, S. K. Khanna, C.E.G. Justo and Veeraraghavan, Nemchand and Brothers Publications 2019. 10th Edition.
5. Indian Standard DRINKING WATER — SPECIFICATION IS 10500-2012.

**PART B: BASIC MECHANICAL ENGINEERING**

**UNIT I**

**Introduction to Mechanical Engineering:** Role of Mechanical Engineering in Industries and Society- Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors.

**Engineering Materials - Metals-Ferrous and Non-ferrous, Ceramics, Composites, Smart Materials. Manufacturing Processes:** Principles of Casting, Forming, joining processes, Machining, Introduction to CNC machines, 3D printing, and Smart manufacturing.

**UNIT II**

**Introduction to Robotics - Joints & links, configurations, and applications of robotics.** (Note: The subject covers only the basic principles of Civil and Mechanical Engineering systems. The evaluation shall be intended to test only the fundamentals of the subject.)

**Thermal Engineering – Working principle of Boilers, Otto cycle, Diesel cycle, Refrigeration and air-conditioning cycles, IC engines, 2-Stroke and 4-Stroke engines, SI / CI Engines, Components of Electric and Hybrid Vehicles.**

**Power plants – Working principle of Steam, Diesel, Hydro, Nuclear power plants. Mechanical Power Transmission - Belt Drives, Chain, Rope drives, Gear Drives and their applications.**

**Textbooks:**

1. Internal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India) Pvt. Ltd.
2. A text book of Theory of Machines by S.S. Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd.
3. An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.

**Reference Books:**

1. G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd.
2. Thermal Engineering by Mahesh M Rathore Tata McGraw Hill publications (India) Pvt. Ltd.
3. 3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications
4. Appuu Kuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I

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