



**MANAV RACHNA UNIVERSITY**  
**DEPARTMENT OF COMPUTER SCIENCE & TECHNOLOGY**

**B.TECH-CSE (CSU01)**

**SEMESTER - 1**

<b>SUBJECT CODES</b>	<b>SUBJECT NAME</b>	<b>**OFFERING DEPARTMENT</b>	<b>*COURSE NATURE (Hard/Soft/ Workshop/ NTCC)</b>	<b>COURSE TYPE (Core/Elective / University Compulsory)</b>	<b>L</b>
ECH101-T	ELECTRICAL ENGINEERING	EC	HARD	CORE	3
ECH101-P	ELECTRICAL ENGINEERING LAB	EC	HARD	CORE	0
CSH101-T	STRUCTURED PROGRAMMING	CS	HARD	CORE	3
CSH101-P	STRUCTURED PROGRAMMING LAB	CS	HARD	CORE	0
PHH104-T	PHYSICS OF MATERIALS	PH	HARD	CORE	3
PHH104-P	PHYSICS OF MATERIALS LAB	PH	HARD	CORE	0
MAH101-T	APPLIED MATHEMATICS	MA	HARD	CORE	3
MAH101-P	APPLIED MATHEMATICS LAB	MA	HARD	CORE	0
HLS101	BUSINESS ENGLISH	HL	SOFT	CORE	1
CSW102	HTML5 & CSS	CS	WORKSHOP	CORE	0
FLS103	FRENCH-I				

FLS101	SPANISH-I	MRCFL	NTCC	UNIVERSITY COMPULSORY(Elective FL-1)	1
FLS102	GERMAN-I				
CHS102	ENVIRONMENTAL SCIENCE	CH	NTCC	UNIVERSITY COMPULSORY	1
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>15</b>

<b>SEMESTER - 2</b>					
<b>SUBJECT CODES</b>	<b>SUBJECT NAME</b>	<b>**OFFERING DEPARTMENT</b>	<b>*COURSE NATURE (Hard/Soft/ Workshop/ NTCC)</b>	<b>COURSE TYPE (Core/Elective / University Compulsory)</b>	<b>L</b>
CSH103-T	DATA STRUCTURES	CS	HARD	CORE	3
CSH103-P	DATA STRUCTURES LAB	CS	HARD	CORE	0
PHH105-T	OPTICS & OPTICAL DEVICES	PH	HARD	CORE	3
PHH105-P	OPTICS & OPTICAL DEVICES LAB	PH	HARD	CORE	0
CHH101-T	GREEN CHEMISTRY	CH	HARD	CORE	3
CHH101-P	GREEN CHEMISTRY LAB	CH	HARD	CORE	0
MAH106-T	DISCRETE MATHEMATICS	MA	HARD	CORE	3
MAH106-P	DISCRETE MATHEMATICS LAB	MA	HARD	CORE	0
HLS102	COMMUNICATIVE ENGLISH	HL	SOFT	CORE	1
MEW103	ENGINEERING DRAWING	ME	WORKSHOP	ELECTIVE(Workshop Elective-1)	0
ECW104	ELECTRONIC WORKSHOP	EC			

FLS107	FRENCH-II	MRCFL	NTCC	UNIVERSITY COMPULSORY(Elective FL-2)	1
FLS105	SPANISH-II				
FLS106	GERMAN-II				
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>14</b>

CSO104	SUMMER TRAINING POST 2nd SEMESTER
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SEMESTER - 3					
SUBJECT CODES	SUBJECT NAME	OFFERING DEPARTMENT	COURSE NATURE (Hard/Soft/)	COURSE TYPE (Core/Elective/)	L
CSH205-T	DATABASE MANAGEMENT SYSTEMS	CS	HARD	CORE	3
CSH205-P	DATABASE MANAGEMENT SYSTEMS LAB	CS	HARD	CORE	0
CSH206-T	OBJECT ORIENTED PROGRAMMING USING JAVA	CS	HARD	CORE	3
CSH206-P	OBJECT ORIENTED PROGRAMMING USING JAVA LAB	CS	HARD	CORE	0
ECH207-T	PRINCIPLES OF DIGITAL ELECTRONICS & CIRCUIT DESIGN	EC	HARD	CORE	3
ECH207-P	PRINCIPLES OF DIGITAL ELECTRONICS & CIRCUIT DESIGN LAB	EC	HARD	CORE	0
MAH208-T	STATISTICAL AND NUMERICAL TECHNIQUES	MA	HARD	CORE	3
MAH208-P	STATISTICAL AND NUMERICAL TECHNIQUES LAB	MA	HARD	CORE	0

CHS234	ENVIRONMENT SUSTAINABLE DEVELOPMENT	CH	SOFT	ELECTIVE(Elective Environmental Ethics & Sustainable Development)	1
ECS249	E-WASTE MANAGEMENT	EC			
CDO201	PROFESSIONAL COMPETANCY ENHANCEMENT-I	CDC	OUTCOME	CORE	0
RDO201	INTRODUCTION TO RESEARCH	RESEARCH	OUTCOME	CORE	0
CSW208	SCRIPTING LANGUAGES	CS	WORKSHOP	ELECTIVE(Workshop Elective-2)	0
CSW207	IMAGE EDITING & ANIMATION	CS	WORKSHOP		
FLS211	FRENCH-III	MRCFL	NTCC	UNIVERSITY COMPULSORY(Elective FL-3)	1
FLS209	SPANISH-III				
FLS210	GERMAN-III				
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>14</b>

SEMESTER - 4					
SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/ Workshop/ NTCC)	COURSE TYPE (Core/Elective / University Compulsory)	L
CSH209-T	THEORY OF COMPUTATION & COMPILER DESIGN	CS	HARD	CORE	3

CSH209-P	THEORY OF COMPUTATION & COMPILER DESIGN LAB	CS	HARD	CORE	0
CSH210-T	COMPUTER ARCHITECTURE & ORGANISATION	CS	HARD	CORE	3
CSH210-P	COMPUTER ARCHITECTURE & ORGANISATION LAB	CS	HARD	CORE	0
CSH211-T	OPERATING SYSTEMS	CS	HARD	CORE	3
CSH211-P	OPERATING SYSTEMS LAB	CS	HARD	CORE	0
ECH434-T	WIRELESS COMMUNICATION	EC	HARD	CORE	3
ECH434-P	WIRELESS COMMUNICATION LAB	EC	HARD	CORE	0
EDS288	APPLIED PHILOSOPHY				1
EDS289	APPLIED PSYCHOLOGY				
EDS290	APPLIED SOCIOLOGY	ALL	SOFT	ELECTIVE (Elective Humanities)	
CDO202	ENHANCEMENT-II	CDC	OUTCOME	CORE	0
RDO202	TECHNICAL SEMINAR-I	RESEARCH	OUTCOME	CORE	0
CSW213	UNIX & SHELL PROGRAMMING	CS	WORKSHOP	CORE	0

FLS215	FRENCH-IV	MRCFL	NTCC	UNIVERSITY COMPULSORY(Elective FL-4)	1
FLS213	SPANISH-IV				
FLS214	GERMAN-IV				
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>14</b>
CSO215 SUMMER TRAINING POST 4TH SEMESTER					

SEMESTER - 5					
SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/ Workshop/ NTCC)	COURSE TYPE (Core/Elective / University Compulsory)	L
CSH316-T	ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS	CS	HARD	CORE	3
CSH316-P	ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS LAB	CS	HARD	CORE	0
CSH317-T	SOFTWARE ENGINEERING	CS	HARD	CORE	3
CSH317-P	SOFTWARE ENGINEERING LAB	CS	HARD	CORE	0
CSH318-T	COMPUTER NETWORKS	CS	HARD	CORE	3

CSH318-P	COMPUTER NETWORKS LAB	CS	HARD	CORE	0
CSH319-T	MOBILE COMPUTING WITH ANDROID	CS	HARD	ELECTIVE(Domain Elective-1)	3
CSH320-T	INTERNET STANDARDS & OPEN SOURCE SOFTWARE				
CSH321-T	DATA WAREHOUSING & DATA MINING				
CSH322-T	ADVANCED OPERATING SYSTEMS				
CSH319-P	MOBILE COMPUTING WITH ANDROID LAB	CS	HARD	ELECTIVE(Domain Elective-1)	0
CSH320-P	INTERNET STANDARDS & OPEN SOURCE SOFTWARE LAB				
CSH321-P	DATA WAREHOUSING & DATA MINING LAB				
CSH322-P	ADVANCED OPERATING SYSTEMS LAB				
LWS321 LWS322	CYBER LAW KNOWLEDGE	LW	SOFT	ELECTIVE(Electives Law)	1
RDO303	TECHNICAL SEMINAR-II	RESEARCH	OUTCOME	CORE	0
CDO305	ENHANCEMENT-III	CDC	OUTCOME	CORE	0
CSW324	INTRODUCTION TO MATLAB	CS	WORKSHOP	ELECTIVE(Workshop Elective-3)	0
CSW325	WEB SERVICES				

FLS319	FRENCH-V	MRCFL	NTCC	UNIVERSITY COMPULSORY(Elective FL-5)	1
FLS317	SPANISH-V				
FLS318	GERMAN-V				
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>14</b>

SEMESTER - 6					
SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/ Workshop/ NTCC)	(Core/Elective / University Compulsory)	L
CSH326-T	ANALYSIS & DESIGN OF ALGORITHMS	CS	HARD	CORE	3
CSH326-P	ANALYSIS & DESIGN OF ALGORITHMS LAB	CS	HARD	CORE	0
CSH327-T	COMPUTER GRAPHICS & MULTIMEDIA	CS	HARD	CORE	3
CSH327-P	COMPUTER GRAPHICS & MULTIMEDIA LAB	CS	HARD	CORE	0
CSH328-T	MULTI PLATFORM MOBILE DEVELOPMENT	CS	HARD	ELECTIVE(Domain	2
CSH329-T	NETWORK SECURITY & CRYPTOGRAPHY				



CSH330-T	BUSINESS INTELLIGENCE & ITS APPLICATIONS	CS	HARD	Elective-2)	0
CSH331-T	SOFTWARE PROJECT MANAGEMENT				
CSH328-P	MULTI PLATFORM MOBILE DEVELOPMENT LAB				
CSH329-P	NETWORK SECURITY & CRYPTOGRAPHY LAB	CS	HARD	ELECTIVE(Domain Elective-2)	0
CSH330-P	BUSINESS INTELLIGENCE & ITS APPLICATIONS LAB				
CSH331-P	SOFTWARE PROJECT MANAGEMENT LAB				
ECH326-T	MICROPROCESSORS & INTERFACING	EC	HARD	ELECTIVE(Allied Elective Engineering)	3
ECH318-T	DIGITAL SYSTEM DESIGN				
RDO304	PROJECT PHASE-I	RESEARCH	OUTCOME	CORE	0
ECH326-P	MICROPROCESSORS & INTERFACING LAB	EC	HARD	ELECTIVE(Allied Elective Engineering)	0
ECH318-P	DIGITAL SYSTEM DESIGN LAB				
CDO306	ENHANCEMENT-IV	CDC	OUTCOME	CORE	0
MCS232	INTRODUCTION TO FINANCE				
MCS231	BASICS OF ECONOMICS				
CSW332	INTRODUCTION TO .NET	CS	WORKSHOP	ELECTIVE(Workshop Elective-4)	0
CSW333	SOCKET PROGRAMMING				
CSW334	GAME PROGRAMMING				
FLS322	FRENCH-VI	MRCFL	NTCC	UNIVERSITY COMPULSORY(Elective	1
FLS320	SPANISH-VI				

FLS321	GERMAN-VI			FL-0)	
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>14</b>
CSO335	SUMMER TRAINING POST 6TH SEMESTER				

SEMESTER - 7					
SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/	COURSE TYPE (Core/Elective /	L
CSH436-T	ADVANCED JAVA	CS	HARD	CORE	3
CSH436-P	ADVANCED JAVA LAB	CS	HARD	CORE	0
CSH437-T	IOS APP DEVELOPMENT	CS	HARD	ELECTIVE(Domain Elective-3)	3
CSH438-T	CLOUD COMPUTING				
CSH439-T	BIG DATA				
CSH440-T	NO SQL DATABASE MODELS				
CSH441-T	INTRODUCTION TO MACHINE LEARNING				
CSH437-P	IOS APP DEVELOPMENT LAB	CS	HARD	ELECTIVE(Domain	0
CSH438-P	CLOUD COMPUTING LAB				
CSH439-P	BIG DATA LAB				

CSH440-P	NO SQL DATABASE MODELS LAB	CS	LAB	Elective-3)	0
CSH441-P	INTRODUCTION TO MACHINE LEARNING LAB				
	ENTERPRENURSHIP	MC	SOFT	ELECTIVE(Electives Enterprenurship)	1
CSW443	USER EXPERIENCE	CS	WORKSHOP	ELECTIVE(Workshop Elective-5)	0
CSW442	SOFTWARE TESTING				
CSN444	MAJOR PROJECT- AGILE (STAGE-I)	CS	NTCC	CORE	0
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>7</b>

SEMESTER - 8					
SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/Workshop/ NTCC)	COURSE TYPE (Core/Elective / University Compulsory)	L
CSH445-T	MOBILE APP ANALYTICS	CS	HARD	ELECTIVE(Domain Elective-4)	3
CSH446-T	INFORMATION RETREIVAL				
CSH447-T	BUSINESS ANALYTICS WITH R PROGRAMMING				
CSH448-T	NEURAL NETWORK & FUZZY LOGIC				
CSH449-T	ADVANCED COMPUTER ARCHITECTURE				
CSH445-P	MOBILE APP ANALYTICS LAB	CS	HARD	ELECTIVE(Domain Elective-4)	0
CSH446-P	INFORMATION RETREIVAL LAB				
CSH447-P	BUSINESS ANALYTICS WITH R PROGRAMMING LAB				
CSH448-P	NEURAL NETWORK & FUZZY LOGIC LAB				
CSH449-P	ADVANCED COMPUTER				
MAH310-T	OPERATION RESEARCH	MA	HARD	ELECTIVE	3
PHH401-T	RENEWABLE ENERGY SYSTEMS	PH			
	ELECTIVE FROM CHEMISTRY	CH	HARD	ELECTIVE	0
MAH310-T	OPERATION RESEARCH LAB	MA			
PHH401-P	RENEWABLE ENERGY SYSTEMS LAB	PH			
	ELECTIVE FROM CHEMISTRY	CH			

CSN450	MAJOR PROJECT-AGILE (STAGE-II)	CS	NTCC	CORE	0
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>6</b>

<b>*COURSE NATURE</b>	<b>Hard course (H):</b> A course having L-T-P and/or O component ; L(Lec
	<b>Soft Course (S):</b> A course aimed at development of a person's emotion
	<b>Workshop course(W):</b> A completely 'hands on' course conducted in la
	<b>Non Teaching Credit Course(N):</b> The course involves no teaching an

<b>**OFFERING DEPARTMENT NAMES</b>	
<b>EC</b>	DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
PH	DEPARTMENT OF PHYSICS
CS	DEPARTMENT OF COMPUTER SCIENCE & TECHNOLOGY
HL	DEPARTMENT OF HUMANITIES & LANGUAGES
CH	DEPARTMENT OF CHEMISTRY
MA	DEPARTMENT OF MATHEMATICS
ME	DEPARTMENT OF MECHANICAL ENGINEERING
MC	DEPARTMENT OF MANAGEMENT & COMMERCE
MRCFL	MANAV RACHNA CENTRE OF FOREIGN LANGUAGES

\*\*\* Electives are subject to change according to expertise availa

T	P	O	NO. OF CONTACT HOURS PER WEEK	NO. OF CREDITS
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	0	2	1
0	2	0	3	2
0	3	0	3	2

1	0	0	2	0
0	2	0	3	0
<b>5</b>	<b>15</b>	<b>0</b>	<b>35</b>	<b>24</b>

T	P	O	NO. OF CONTACT HOURS PER WEEK	NO. OF CREDITS
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	0	2	1
0	2	0	3	2
0	3	0	3	2

1	0	0	2	0
<b>5</b>	<b>13</b>	<b>0</b>	<b>32</b>	<b>24</b>

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T	P	O	NO. OF CONTACT HOURS PER	NO. OF CREDITS
1	0	0	4	4
0	2	1	2	2
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	0	2	1



0	2	0	3	2
0	0	1	1	0.5
0	0	1	1	1
0	3	0	3	2
1	0	0	2	0
<b>5</b>	<b>13</b>	<b>3</b>	<b>34</b>	<b>26.5</b>

T	P	O	NO. OF CONTACT HOURS PER WEEK	NO. OF CREDITS
1	0	0	4	4

0	2	0	2	1
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	0	2	1
0	2	0	3	2
0	0	1	1	0.5
0	0	1	1	1
0	3	0	3	2

1	0	0	2	0
5	13	2	34	25.5

			3
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T	P	O	NO. OF CONTACT HOURS PER WEEK	NO. OF CREDITS
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4

0	2	0	2	1
1	0	0	4	4
0	2	0	2	1
0	2	0	3	2
0	0	1	1	1
0	0	1	1	0.5
0	3	0	3	2

1	0	0	2	0
5	13	2	34	25.5

T	P	O	NO. OF CONTACT HOURS PER WEEK	NO. OF CREDITS
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	1	2	2
1	0	0	4	4

1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	0	1	1	1
0	2	0	2	1
0	0	1	1	0.5
0	2	0	3	2
0	3	0	3	2
1	0	0	2	0

5	13	0	34	26.5
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T	P	O	NO. OF CONTACT HOURS PER	NO. OF CREDITS
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	0	2	1

0	2	0	3	2
0	2	0	3	2
0	3	0	3	2
0	3	0	3	2
<b>2</b>	<b>12</b>	<b>0</b>	<b>21</b>	<b>16</b>



T	P	O	NO. OF CONTACT HOURS PER WEEK	NO. OF CREDITS
1	0	0	4	4
0	2	0	2	1
1	0	0	4	4
0	2	0	2	1

0	8	0	8	8
2	12	0	20	18

ture), T(Tutorial), P(Practical) and O(Outcome)  
 al, social, ethical, professional and creative potentials. The  
 laboratory, aimed at developing application/ implementation/  
 d has P and O component. Shall include projects, seminars,

	<b>A course shall be assigned credits as under:</b>
	One credit for each lecture hour;
	One credit for each tutorial hour ;
	One credit for each Outcome hour;
	Two credits for each workshop/ laboratory/practical/project session of 3 hours;
	One credit for each laboratory or practical or project session of 2 hours

ble/ required.