



**MANAV RACHNA UNIVERSITY**  
**DEPARTMENT OF COMPUTER SCIENCE & TECHNOLOGY**  
**B.TECH-CSE (CSU01)**

**SEMESTER - 1**

SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/ Workshop/ NTCC)	COURSE TYPE (Core/Elective / University Compulsory)	L	T
ECH101-T	ELECTRICAL ENGINEERING	EC	HARD	CORE	3	1
ECH101-P	ELECTRICAL ENGINEERING LAB	EC	HARD	CORE	0	0
CSH101-T	STRUCTURED PROGRAMMING	CS	HARD	CORE	3	1
CSH101-P	STRUCTURED PROGRAMMING LAB	CS	HARD	CORE	0	0
PHH104-T	PHYSICS OF MATERIALS	PH	HARD	CORE	3	1
PHH104-P	PHYSICS OF MATERIALS LAB	PH	HARD	CORE	0	0
MAH101-T	APPLIED MATHEMATICS	MA	HARD	CORE	3	1
MAH101-P	APPLIED MATHEMATICS LAB	MA	HARD	CORE	0	0
HLS101	BUSINESS ENGLISH	HL	SOFT	CORE	1	0
CSW102	HTML5 & CSS	CS	WORKSHOP	CORE	0	0
FLS103	FRENCH-I	MRCFL	NTCC	UNIVERSITY COMPULSORY	1	1
FLS101	SPANISH-I					

FLS102	GERMAN-I					
CHS102	ENVIRONMENTAL SCIENCE	CH	NTCC	UNIVERSITY COMPULSORY	1	0
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>15</b>	<b>5</b>

SEMESTER - 2						
SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/ Workshop/ NTCC)	COURSE TYPE (Core/Elective / University Compulsory)	L	T
CSH103-T	DATA STRUCTURES	CS	HARD	CORE	3	1
CSH103-P	DATA STRUCTURES LAB	CS	HARD	CORE	0	0
PHH105-T	OPTICS & OPTICAL DEVICES	PH	HARD	CORE	3	1
PHH105-P	OPTICS & OPTICAL DEVICES LAB	PH	HARD	CORE	0	0
CHH101-T	GREEN CHEMISTRY	CH	HARD	CORE	3	1
CHH101-P	GREEN CHEMISTRY LAB	CH	HARD	CORE	0	0
MAH106-T	DISCRETE MATHEMATICS	MA	HARD	CORE	3	1
MAH106-P	DISCRETE MATHEMATICS LAB	MA	HARD	CORE	0	0
HLS102	COMMUNICATIVE ENGLISH	HL	SOFT	CORE	1	0
MEW103	ENGINEERING DRAWING	ME	WORKSHOP	ELECTIVE	0	0
CSW152	iCARNEGIE WORKSHOP SDP02	CS				
ECW104	ELECTRONIC WORKSHOP	EC				

FLS107	FRENCH-II	MRCFL	NTCC	UNIVERSITY COMPULSORY	1	1
FLS105	SPANISH-II					
FLS106	GERMAN-II					
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>14</b>	<b>5</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	T
CSH205-T	DATABASE MANAGEMENT SYSTEMS	CS	HARD	CORE	3	1
CSH205-P	DATABASE MANAGEMENT SYSTEMS LAB	CS	HARD	CORE	0	0
CSH206-T	OBJECT ORIENTED PROGRAMMING USING JAVA	CS	HARD	CORE	3	1
CSH206-P	OBJECT ORIENTED PROGRAMMING USING JAVA LAB	CS	HARD	CORE	0	0
ECH207-T	PRINCIPLES OF DIGITAL ELECTRONICS & CIRCUIT DESIGN	EC	HARD	CORE	3	1
ECH207-P	PRINCIPLES OF DIGITAL ELECTRONICS & CIRCUIT DESIGN LAB	EC	HARD	CORE	0	0
MAH208-T	STATISTICAL AND NUMERICAL TECHNIQUES	MA	HARD	CORE	3	1
MAH208-P	STATISTICAL AND NUMERICAL TECHNIQUES LAB	MA	HARD	CORE	0	0

CHS234	SUSTAINABILITY STRATEGIES	CH	SOFT	ELECTIVE(BASKET OF ENVIRONMENTAL ETHICS & SUSTAINABLE DEVELOPMENT)	1	0
CDO201	PROFESSIONAL COMPETENCY ENHANCEMENT-I	CDC	OUTCOME	CORE	0	0
RDO201	INTRODUCTION TO RESEARCH	RESEARCH	OUTCOME	CORE	0	0
CSW208	SCRIPTING LANGUAGES	CS	WORKSHOP	ELECTIVE	0	0
CSW207	IMAGE EDITING & ANIMATION	CS	WORKSHOP	ELECTIVE		
FLS211	FRENCH-III	MRCFL	NTCC	UNIVERSITY COMPULSORY	1	1
FLS209	SPANISH-III					
FLS210	GERMAN-III					
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>14</b>	<b>5</b>

**SEMESTER - 4**

SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/ Workshop/ NTCC)	COURSE TYPE (Core/Elective / University)	L	T
CSH209-T	THEORY OF COMPUTATION & COMPILER DESIGN	CS	HARD	CORE	3	1
CSH209-P	THEORY OF COMPUTATION & COMPILER DESIGN LAB	CS	HARD	CORE	0	0

CSH210-T	COMPUTER ARCHITECTURE & ORGANISATION	CS	HARD	CORE	3	1
CSH210-P	COMPUTER ARCHITECTURE & ORGANISATION LAB	CS	HARD	CORE	0	0
CSH211-T	OPERATING SYSTEMS	CS	HARD	CORE	3	1
CSH211-P	OPERATING SYSTEMS LAB	CS	HARD	CORE	0	0
ECH434-T	WIRELESS COMMUNICATION	EC	HARD	CORE	3	1
ECH434-P	WIRELESS COMMUNICATION LAB	EC	HARD	CORE	0	0
EDS288	APPLIED PHILOSOPHY	ALL CDC	SOFT OUTCOME	ELECTIVE (HUMANITIES BASKET) CORE	1	0
EDS289	APPLIED PSYCHOLOGY				0	0
CDO202	ENHANCEMENT-II				0	0
RDO202	TECHNICAL SEMINAR-I	RESEARCH	OUTCOME	CORE	0	0
CSW213	UNIX & SHELL PROGRAMMING	CS	WORKSHOP	CORE	0	0
FLS215	FRENCH-IV	MRCFL	NTCC	UNIVERSITY COMPULSORY	1	1
FLS213	SPANISH-IV					
FLS214	GERMAN-IV					
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>14</b>	<b>5</b>

CSW215

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	T
CSH316-T	ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS	CS	HARD	CORE	3	1
CSH316-P	ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS LAB	CS	HARD	CORE	0	0
CSH317-T	SOFTWARE ENGINEERING	CS	HARD	CORE	3	1
CSH317-P	SOFTWARE ENGINEERING LAB	CS	HARD	CORE	0	0
CSH318-T	COMPUTER NETWORKS	CS	HARD	CORE	3	1
CSH318-P	COMPUTER NETWORKS LAB	CS	HARD	CORE	0	0
CSH319-T	MOBILE COMPUTING WITH ANDROID					

CSH320-T	INTERNET STANDARDS & OPEN SOURCE SOFTWARE	CS	HARD	ELECTIVE	3	1
CSH321-T	DATA WAREHOUSING & DATA MINING					
CSH322-T	ADVANCED OPERATING SYSTEMS					
CSH319-P	MOBILE COMPUTING WITH ANDROID LAB	CS	HARD	ELECTIVE	0	0
CSH320-P	INTERNET STANDARDS & OPEN SOURCE SOFTWARE LAB					
CSH321-P	DATA WAREHOUSING & DATA MINING LAB					
CSH322-P	ADVANCED OPERATING SYSTEMS LAB					
LWS321	CYBER LAW	LW	SOFT	ELECTIVE	1	0
LWS322	KNOWLEDGE					
RDO303	TECHNICAL SEMINAR-II	RESEARCH	OUTCOME	CORE	0	0
CDO305	ENHANCEMENT-III	CDC	OUTCOME	CORE	0	0
CSW324	INTRODUCTION TO MATLAB	CS	WORKSHOP	ELECTIVE	0	0
CSW325	WEB SERVICES					
FLS319	FRENCH-V	MRCFL	NTCC	UNIVERSITY COMPULSORY	1	1
FLS317	SPANISH-V					

FLS318	GERMAN-V					
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>14</b>	<b>5</b>

SEMESTER - 6						
SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/ Workshop/ NTCC)	COURSE TYPE (Core/Elective / University)	L	T
CSH326-T	ANALYSIS & DESIGN OF ALGORITHMS	CS	HARD	CORE	3	1
CSH326-P	ANALYSIS & DESIGN OF ALGORITHMS LAB	CS	HARD	CORE	0	0
CSH327-T	COMPUTER GRAPHICS & MULTIMEDIA	CS	HARD	CORE	3	1
CSH327-P	COMPUTER GRAPHICS & MULTIMEDIA LAB	CS	HARD	CORE	0	0
CSH328-T	MULTI PLATFORM MOBILE DEVELOPMENT	CS	HARD	ELECTIVE	3	1
CSH329-T	NETWORK SECURITY & CRYPTOGRAPHY					
CSH330-T	BUSINESS INTELLIGENCE & ITS APPLICATIONS					
CSH331-T	SOFTWARE PROJECT MANAGEMENT					



CSH328-P	MULTI PLATFORM MOBILE DEVELOPMENT LAB	CS	HARD	ELECTIVE	0	0
CSH329-P	NETWORK SECURITY & CRYPTOGRAPHY LAB					
CSH330-P	BUSINESS INTELLIGENCE & ITS APPLICATIONS LAB					
CSH331-P	SOFTWARE PROJECT MANAGEMENT LAB					
ECH326-T	MICROPROCESSORS & INTERFACING	EC	HARD	ELECTIVE	3	1
ECH318-T	DIGITAL SYSTEM DESIGN					
RDO304	PROJECT PHASE-I	RESEARCH	OUTCOME	CORE	0	0
ECH326-P	MICROPROCESSORS & INTERFACING LAB	EC	HARD	ELECTIVE	0	0
ECH318-P	DIGITAL SYSTEM DESIGN LAB					
CDO306	ENHANCEMENT-IV	CDC	OUTCOME	CORE	0	0
MCS232	INTRODUCTION TO FINANCE					
MCS231	BASICS OF ECONOMICS					
CSW332	INTRODUCTION TO .NET	CS	WORKSHOP	ELECTIVE	0	0
CSW333	SOCKET PROGRAMMING					
CSW334	GAME PROGRAMMING					
FLS322	FRENCH-VI	MRCFL	NTCC	UNIVERSITY COMPULSORY	1	1
FLS320	SPANISH-VI					
FLS321	GERMAN-VI					
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>14</b>	<b>5</b>

CSW335

SUMMER TRAINING POST 6TH SEMESTER

## SEMESTER - 7

SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/)	COURSE TYPE (Core/Elective /	L	T
CSH436-T	ADVANCED JAVA	CS	HARD	CORE	3	1
CSH436-P	ADVANCED JAVA LAB	CS	HARD	CORE	0	0
CSH437-T	IOS APP DEVELOPMENT	CS	HARD	ELECTIVE	3	1
CSH438-T	CLOUD COMPUTING					
CSH439-T	BIG DATA					
CSH440-T	NO SQL DATABASE MODELS					
CSH441-T	KNOWLEDGE REPRESENTATION AND MACHINE LEARNING					
CSH437-P	IOS APP DEVELOPMENT LAB	CS	HARD	ELECTIVE	0	0
CSH438-P	CLOUD COMPUTING LAB					
CSH439-P	BIG DATA LAB					
CSH440-P	NO SQL DATABASE MODELS LAB					
CSH441-P	KNOWLEDGE REPRESENTATION AND MACHINE LEARNING LAB					
MCS368B	Enterprenurship	MC	SOFT	ELECTIVE	1	0

CSW443	USER EXPERIENCE	CS	WORKSHOP	ELECTIVE	0	0
CSW442	SOFTWARE TESTING					
CSN444	MAJOR PROJECT- AGILE (STAGE-I)	CS	NTCC	CORE	0	0
	<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>				<b>7</b>	<b>2</b>

**SEMESTER - 8**

SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/Workshop/ NTCC)	COURSE TYPE (Core/Elective / University)	L	T
CSH445-T	MOBILE APP ANALYTICS	CS	HARD	DOMAIN ELECTIVE	3	1
CSH446-T	INFORMATION RETREIVAL					
CSH447-T	BUSINESS ANALYTICS WITH R PROGRAMMING					
CSH448-T	NEURAL NETWORK & FUZZY LOGIC					
CSH449-T	ADVANCED COMPUTER ARCHITECTURE					
MAH310-T	OPERATION RESEARCH	MA	HARD	ALLIED ELECTIVE	3	1
CSH445-P	MOBILE APP ANALYTICS LAB	CS	HARD	ELECTIVE	0	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 ARCHITECTURE					
MAH310-T	OPERATION RESEARCH LAB	MA	HARD	ELECTIVE	0	0
CSN450	MAJOR PROJECT-AGILE (STAGE-II)	CS	NTCC	CORE	0	0
<b>TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)</b>					<b>6</b>	<b>2</b>

<b>*COURSE NATURE</b>	<b>Hard course (H):</b> A course having L-T-P and/or O component ; L(Lecture)
	<b>Soft Course (S):</b> A course aimed at development of a person's emotional, s
	<b>Workshop course(W):</b> A completely 'hands on' course conducted in labora

**Non Teaching Credit Course(N):** The course involves no teaching and has

<b>**OFFERING DEPARTMENT NAMES</b>	
EC	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 available/ requi

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

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

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

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

Mr.Ram Chatterjee & Ms.Nikita

	<b>3</b>
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<b>P</b>	<b>O</b>	<b>NO. OF CONTACT HOURS PER</b>	<b>NO. OF CREDITS</b>
0	0	4	4
2	1	2	2
0	0	4	4
2	0	2	1
0	0	4	4
2	0	2	1
0	0	4	4
2	0	2	1



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

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

Mr.Ankur Kumar,Ms.Veepu

0	0	4	4
2	0	2	1
0	0	4	4
2	0	2	1
0	0	4	4
2	0	2	1
2	0	3	2
0	1	1	0.5
0	1	1	1
3	0	3	2
0	0	2	0
<b>13</b>	<b>2</b>	<b>34</b>	<b>25.5</b>

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

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

13	2	34	25.5

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

2	0	2	1
0	0	4	4
0	1	1	1
2	0	2	1
0	1	1	0.5
2	0	3	2
3	0	3	2
0	0	2	0
<b>13</b>	<b>0</b>	<b>34</b>	<b>25</b>

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

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



P	O	NO. OF CONTACT HOURS PER WEEK	NO. OF CREDITS
0	0	4	4
0	0	4	4
2	0	2	1
2	0	2	1
8	0	8	8
<b>12</b>	<b>0</b>	<b>20</b>	<b>18</b>

, T(Tutorial), P(Practical) and O(Outcome)  
social, ethical, professional and creative potentials.  
atory, aimed at developing application/

s P and O component. Shall include projects,

**A course shall be assigned credits as under:**

- 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

ired.