



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
CHH137	ENVIRONMENTAL SCIENCE	CH	HARD	CORE	3	0
TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)					15	5

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(Workshop Elective-1)	0	0
ECW104	ELECTRONIC WORKSHOP	EC				
TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)					14	5

CSO104

SUMMER TRAINING POST 2nd SEMESTER

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	ENVIRONMENT SUSTAINABLE DEVELOPMENT	CH	SOFT	ELECTIVE(Elective Environmental Ethics & Sustainable Development)	1	0
ECS249	E-WASTE MANAGEMENT	EC				
CDO201	PROFESSIONAL COMPETANCY ENHANCEMENT-I	CDC	OUTCOME	CORE	0	0
RDO201	INTRODUCTION TO RESEARCH	RESEARCH	OUTCOME	CORE	0	0
CSW208	SCRIPTING LANGUAGES	CS	WORKSHOP	ELECTIVE(Workshop Elective-2)	0	0
CSW207	IMAGE EDITING & ANIMATION	CS	WORKSHOP			

FLS103	FRENCH-I	MRCFL	NTCC	UNIVERSITY COMPULSORY(Elective FL- 1)	1	1
FLS101	SPANISH-I					
FLS102	GERMAN-I					
TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)					14	5

SEMESTER - 4						
SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/Workshop/ NTCC)	COURSE TYPE (Core/Elective / University Compulsory)	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

ECH251-T	WIRELESS COMMUNICATION	EC	HARD	CORE	3	1	
ECH251-P	WIRELESS COMMUNICATION LAB	EC	HARD	CORE	0	0	
EDS288	APPLIED PHILOSOPHY			ELECTIVE (Elective Humanities)	1	0	
EDS289	APPLIED PSYCHOLOGY						
EDS290	APPLIED SOCIOLOGY						
MOOC	NPTEL Courses from MOOC						
CDO202	ENHANCEMENT-II	CDC	OUTCOME	CORE	0	0	
RDO202	TECHNICAL SEMINAR-I	RESEARCH	OUTCOME	CORE	0	0	
CSW213	UNIX & SHELL PROGRAMMING	CS	WORKSHOP	CORE	0	0	
FLS107	FRENCH-II	MRCFL	NTCC	UNIVERSITY COMPULSORY(Elective FL- 2)	1	1	
FLS105	SPANISH-II						
FLS106	GERMAN-II						
TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)					14	5	
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	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	CS	HARD	ELECTIVE(Domain Elective-1)	3	1
CSH320-T	INTERNET STANDARDS & OPEN SOURCE SOFTWARE					
CSH321-T	DATA WAREHOUSING & DATA MINING					

CSH322-T	ADVANCED OPERATING SYSTEMS					
MOOC	NPTEL MOOC		HARD	ELECTIVE		
CSH319-P	MOBILE COMPUTING WITH ANDROID LAB	CS	HARD	ELECTIVE(Domain Elective-1)	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(Electives Law)	2	0
LWS323	PROPERTY RIGHTS					
MOOC	NPTEL MOOC		SOFT	ELECTIVE		
RDO303	TECHNICAL SEMINAR-II	RESEARCH	OUTCOME	CORE	0	0
CDO305	ENHANCEMENT-III	CDC	OUTCOME	CORE	0	0
CSW324	INTRODUCTION TO MATLAB	CS	WORKSHOP	ELECTIVE(Workshop Elective-3)	0	0
CSW325	WEB SERVICES					
MOOC	NPTEL MOOC		WORKSHOP	ELECTIVE		
TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)					14	5

SEMESTER - 6

SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/ Workshop/ NTCC)	COURSE TYPE (Core/Elective / University Compulsory)	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(Domain Elective-2)	3	1
CSH329-T	NETWORK SECURITY & CRYPTOGRAPHY					
CSH330-T	BUSINESS INTELLIGENCE & ITS APPLICATIONS					
CSH331-T	SOFTWARE PROJECT MANAGEMENT					
MOOC	NPTEL MOOC		HARD	ELECTIVE		
CSH328-P	MULTI PLATFORM MOBILE DEVELOPMENT LAB					
CSH329-P	NETWORK SECURITY & CRYPTOGRAPHY LAB			ELECTIVE(Domain		

CSH330-P	BUSINESS INTELLIGENCE & ITS APPLICATIONS LAB	CS	HARD	Elective-2)	0	0	
CSH331-P	SOFTWARE PROJECT MANAGEMENT LAB						
ECH326-T	MICROPROCESSORS & INTERFACING	EC	HARD	ELECTIVE(Allied Elective Engineering)	3	1	
ECH318-T	DIGITAL SYSTEM DESIGN						
RDO304	PROJECT PHASE-I	RESEARCH	OUTCOME	CORE	0	0	
ECH326-P	MICROPROCESSORS & INTERFACING LAB	EC	HARD	ELECTIVE(Allied Elective Engineering)	0	0	
ECH318-P	DIGITAL SYSTEM DESIGN LAB						
CDO306	ENHANCEMENT-IV	CDC	OUTCOME	COE	0	0	
MCS232	INTRODUCTION TO FINANCE						
MCS231	BASICS OF ECONOMICS	MC			1	0	
	PEACE	ED	SOFT	ELECTIVE(Elective Management)			
MOOC	NPTEL MOOC		SOFT				
CSW332	INTRODUCTION TO .NET	CS	WORKSHOP	ELECTIVE(Workshop Elective-4)	0	0	
CSW333	SOCKET PROGRAMMING						
CSW334	GAME PROGRAMMING						
MOOC	NPTEL Courses from MOOC						
TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)					14	5	
CSO335	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(Domain Elective-3)	3	1
CSH438-T	CLOUD COMPUTING					
CSH439-T	BIG DATA					
CSH440-T	NO SQL DATABASE MODELS					
CSH441-T	INTRODUCTION TO MACHINE LEARNING					
MOOC	NPTEL Courses from MOOC					
CSH437-P	IOS APP DEVELOPMENT LAB	CS	HARD	ELECTIVE(Domain Elective-3)	0	0
CSH438-P	CLOUD COMPUTING LAB					
CSH439-P	BIG DATA LAB					
CSH440-P	NO SQL DATABASE MODELS LAB					
CSH441-P	INTRODUCTION TO MACHINE LEARNING LAB					
	ENTERPRENURSHIP	MC	SOFT	ELECTIVE(Electives Enterprenurship)	1	0
MOOC	NPTEL Courses from MOOC					
CSW443	USER EXPERIENCE	CS	WORKSHOP	ELECTIVE(Workshop Elective-5)	0	0
CSW442	SOFTWARE TESTING					
MOOC	NPTEL Courses from MOOC					

CSN444	MAJOR PROJECT- AGILE (STAGE-I)	CS	NTCC	CORE	0	0
	TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)				7	2

SEMESTER - 8

SUBJECT CODES	SUBJECT NAME	**OFFERING DEPARTMENT	*COURSE NATURE (Hard/Soft/ Workshop/ NTCC)	COURSE TYPE (Core/Elective / University Compulsory)	L	T
CSH445-T	MOBILE APP ANALYTICS	CS	HARD	ELECTIVE(Domain Elective-4)	3	1
CSH446-T	INFORMATION RETREIVAL					
CSH447-T	BUSINESS ANALYTICS WITH R PROGRAMMING					
CSH448-T	NEURAL NETWORK & FUZZY LOGIC					
CSH449-T	ADVANCED COMPUTER ARCHITECTURE					
MOOC	NPTEL Courses from MOOC					
CSH445-P	MOBILE APP ANALYTICS LAB	CS	HARD	ELECTIVE(Domain Elective-4)	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	MA	HARD	ELECTIVE	3	1
PHH401-T	RENEWABLE ENERGY SYSTEMS	PH				
	ELECTIVE FROM CHEMISTRY	CH				
MAH310-T	OPERATION RESEARCH LAB	MA	HARD	ELECTIVE	0	0
PHH401-P	RENEWABLE ENERGY SYSTEMS LAB	PH				

	ELECTIVE FROM CHEMISTRY	CH				
CSN450	MAJOR PROJECT-AGILE (STAGE-II)	CS	NTCC	CORE	0	0
TOTAL (L-T-P-O/CONTACT HOURS/CREDITS)					6	2

*COURSE NATURE	Hard course (H): A course having L-T-P and/or O component ; L(Lecture), T(Tu
	Soft Course (S): A course aimed at development of a person's emotional, social, e
	Workshop course(W): A completely 'hands on' course conducted in laboratory, a
	Non Teaching Credit Course(N): The course involves no teaching and has P and

**OFFERING DEPARTMENT NAMES	
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/ required

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	1	4	4
15	0	34	28

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
13	0	#REF!	24

	3
--	----------



P	O	NO. OF CONTACT HOURS PER	NO. OF CREDITS
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
13	3	34	26.5

P	O	NO. OF CONTACT HOURS PER WEEK	NO. OF CREDITS
0	0	4	4
2	0	2	1
0	0	4	4
2	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
13	2	34	25.5

	3
--	----------

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
0	0	2	2
0	1	1	1
0	1	1	0.5
3	0	3	2
13	2	31	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
13	0	32	26.5

			3
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
12	0	21	16

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

8	0	8	8
12	0	20	18

torial), P(Practical) and O(Outcome)
 ethical, professional and creative potentials. The
 imed at developing application/ implementation/
 O component. Shall include projects, seminars,

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

.