SANDIP UNIVERSITY
SCHOOL OF COMPUTER SCIENCE & ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MAHIRAVANI, TRIMBAK ROAD, TAL & DIST: NASHIK-422213, MAHARASHTRA,INDIA

CURRICULA FOR UG PROGRAMS

Table 1: Coverage of Subject Area over Curriculum (UG Programs)

Semester	Subject Area Coverage
I-II	Basic Science Courses, Engineering Science Course, Program Core Courses, Vocational and Skill Enhancement Courses, Ability Enhancement Courses, Indian Knowledge System (IKS), Co-curricular Courses.
III-IV	Combined institute and program core courses, Open Electives, Multidisciplinary Minor, Value Added Courses, Vocational and Skill Enhancement Courses, Ability Enhancement Courses, Entrepreneurship/Economics/Management Course, Value Education Courses, Community Engineering Project.
V-VI	Combined institute and program core courses, Program Electives, Multidisciplinary Minor, Open Elective, Vocational and Skill Enhancement Course.
VII - VIII	Program Core Courses, Program Electives, Multidisciplinary Minor, Internship, Research Methodology, Project work.

Abbreviations

CIA	Continuous Internal Assessment	**AEC**	Ability Enhancement Course
L	Theory Lecture	**BSC**	Basic Science Course
T	Tutorial	**ESC**	Engineering Science Course
P	Practical	**CEP**	Community Engagement Project
TC	Total Credits	**EC**	Exit Course
CP	Credits for Practical	**HSSM**	Humanities, Social Science and Management
CT	Credits for Theory	**IKS**	Indian Knowledge System
OE	Open Elective	**VSEC**	Vocational and Skill Enhancement Course
PCC	Programme Core Courses	**MDM**	Multidisciplinary Minor
PEC	Programme Elective Courses	**LLC**	Liberal Learning Course
VAC	Value Added Course	**VEC**	Value Education Course
HM	Honors / Minor Program Course	**ELC**	Experiential Learning Course
SDC	Skill Development Course	a	Oral/ Presentation Examination
EEC	Employability Enhancement Course	b	Practical Examination

SANDIP UNIVERSITY
SCHOOL OF COMPUTER SCIENCE & ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MAHIRAVANI, TRIMBAK ROAD, TAL & DIST: NASHIK-422213, MAHARASHTRA,INDIA

Assessment for Theory Course *(Scaled to allotted marks)*		
CIA	**Weightage**	**Description**
CIA 1	10%	Home Assignments
CIA 2	20%	Written Exam Components
CIA 3	10%	Activity/Project and Research Based Learning along with Seminar Presentation
CIA 4	10%	Behavioral Attitude and General Discipline (5%), Theory and Practical Attendance (5%)
ESE	50%	End Semester Examination
TOTAL	**100%**	

		Formative Assessment		
CIA: Continuous Internal Assessment **L**: Theory Lecture **T**: Tutorial **P**: Practical **ESE**: End Semester Exam	*: Oral Examination **PCC**: Program Core course **PEC**: Programme elective Core **OE:**Open Elective **VAC:** Value Added Courses **AEC :**AbilityEnhancement curses **CEP/FP:**Communityencougement project/Field project **VSEC:** Vocational and Skill Enhancement Course **MDM:** Multidisciplinary minor course	**CIA**	**Weightage**	**Description**
		CIA 1	10%	Home Assignment
		CIA 2	20%	Written Exam
		CIA 3	10%	Seminar Presentation
		CIA 4	10%	• Behavioural Attitude + General Discipline (5%) • Theory + practical attendance 5%)
		TOTAL	**50%**	

SANDIP UNIVERSITY
SCHOOL OF COMPUTER SCIENCE & ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MAHIRAVANI, TRIMBAK ROAD, TAL & DIST: NASHIK-422213, MAHARASHTRA,INDIA

Multidisciplinary Minor offered by Computer Science & Engineering Department Minor in Cyber Security and Forensic

Sr. No.	Course Name	Course Code	Scheme	Credits	Semester
1	Cyber Ethic, Laws and Policy	NYCFM--	2-0-0	2	3rd
2	Introduction to Cryptography	NYCFM--	2-0-0	2	4th
3	Social Media Security	NYCFM--	4-0-0	4	5th
4	BlockChain Technology	NYCFM--	2-0-0	2	6th
5	Data Security and Privacy	NYCFM--	2-0-0	2	7th
6	E-commerce and Digital Payments	NYCFM--	2-0-0	2	8th
TOTAL				**14**	

Honors Courses offered by Computer Science & Engineering Department Minor in Cyber Security and Forensic

Sr.No.	Course Name	Course Code	Scheme	Credits	Semester
1	Fundamental of Cyber Security	NYCFH__	3-0-0	3	4th
2	Advanced DBMS	NYCFH__	3-0-0	3	5th
3	Advanced OS	NYCFH__	3-0-0	3	6th
4	Advanced Computer Network	NYCFH__	3-0-0	3	7th
5	Advanced Complier Design	NYCFH__	3-0-0	3	8th
TOTAL				**15**	

SANDIP UNIVERSITY
SCHOOL OF COMPUTER SCIENCE & ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MAHIRAVANI, TRIMBAK ROAD, TAL & DIST: NASHIK-422213, MAHARASHTRA,INDIA

Open Electives offered by Computer Science & Engineering Department in Cyber Security and Forensic

Sr. No.	Open Elective #	Course Name	Course Code	Scheme	Credits	Semester
1	Open Elective I	Fundamental of Computer Basics	NYCSO01	3-0-0	3	III
2	Open Elective I	Multimedia System	NYCSO02	3-0-0		III
3	Open Elective II	Introduction to Artificial Intelligence	NYCSO03	3-0-0	3	IV
4	Open Elective II	Introduction to DBMS	NYCSO04	3-0-0		IV
5	Open Elective III	Cyber Law & Ethics	NYCSO05	2-0-0	2	V
6	Open Elective III	Introduction to Reverse Engineering	NYCSO06	2-0-0		V
TOTAL					08	

SANDIP UNIVERSITY
SCHOOL OF COMPUTER SCIENCE & ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MAHIRAVANI, TRIMBAK ROAD, TAL & DIST: NASHIK-422213, MAHARASHTRA,INDIA

Program Elective Courses offered by Computer Science & Engineering Department in Cyber Security and Forensic

Sr. No.	Program Elective Courses#	Course Name	Course Code	Scheme	Credits	Semester
1	PEC#1	Big Data Technologies	NYCFE01	3-0-0	3	V
2	PEC#1	Information Theory and Coding	NYCFE02	3-0-0		V
3	PEC#2	Augmented Reality and Virtual Reality	NYCFE03	3-0-0	3	VI
4	PEC#2	Data Science	NYCFE04	3-0-0		VI
5	PEC#3	Enterprise Infrastructure security	NYCFE05	3-0-0	3	VI
6	PEC#3	Identity and Access management	NYCFE06	3-0-0		VI
7	PEC#4	Cyber Threat and Intelligence Management	NYCFE07	3-0-0	3	VII
8	PEC#4	Data Science for Cybersecurity and Forensics	NYCFE08	3-0-0		VII
9	PEC#5	Application and Web Security	NYCFE09	2-0-0	2	VIII
10	PEC#5	Cloud Security	NYCFE10	2-0-0		VIII
11	PEC#6	High Performance Computing	NYCFE11	3-0-0	3	VIII
12	PEC#6	Cyber Physical System Security	NYCFE12	3-0-0		VIII
		TOTAL			**17**	

SANDIP UNIVERSITY
SCHOOL OF COMPUTER SCIENCE & ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MAHIRAVANI, TRIMBAK ROAD, TAL & DIST: NASHIK-422213, MAHARASHTRA,INDIA

B. Tech Compute Sciences and Engineering(Specialization in Cyber Security and Forensic)
Semester – III

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme (Hrs./Week)				Examination Scheme				Total Marks
				L	T	P	C	Formative Assessment CIA		Summative Assessment ESE		
								Theory	Lab	Theory	Lab	
1	PCC	NYCF301	Discrete Mathematics and Logic	3	--	--	3	50	--	100	--	100
2	PCC	NYCF302	Cyber Security and Laws	3	--	--	3	50	--	100	--	100
3	PCC	NYCF303	Data Structures	3	--	--	3	50	--	100	--	100
4	PCC	NYCF311	Data Structure Laboratory	--	--	2	1	--	50	--	50*	50
5	OE	NYCFO01	Open Elective-I	3	--	--	3	50	--	100	--	100
6	VEC	NLWV01	The Constitution & Human Rights	2	--	--	2	50	--	100	--	100
7	MDM	----------	Minor Course #1	2	--		2	50	--	100	--	100
8	CEP	NYCF312	Community Engagement Project	--	--	4	2	--	50		50*	50
9	AEC	NHSA11	Key Competencies for Career Growth	--	--	4	2		50		50*	50
TOTAL				**16**	**00**	**10**	**21**	**300**	**150**	**600**	**150**	**750**
Value Added Course (ANY One)												
10	VAC	----------	Programming In C++	--	--	2	--	--	25	--	--	25

		Formative Assessment		
CIA: Continuous Internal Assessment **L**: Theory Lecture **T**: Tutorial **P**: Practical **ESE**: End Semester Exam	*: Oral Examination **PCC**: Program Core course **PEC**: Programme elective Core **OE:**Open Elective **VAC:** Value Added Courses **AEC :**AbilityEnhancement curses **CEP/FP:**Communityencougement project/Field project **VSEC:** Vocational and Skill Enhancement Course **MDM:** Multidisciplinary minor course	**CIA**	**Weightage**	**Description**
		CIA 1	10%	Home Assignment
		CIA 2	20%	Written Exam
		CIA 3	10%	Seminar Presentation
		CIA 4	10%	• Behavioural Attitude + General Discipline (5%) • Theory + practical attendance 5%)
		TOTAL	**50%**	

SANDIP UNIVERSITY
SCHOOL OF COMPUTER SCIENCE & ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MAHIRAVANI, TRIMBAK ROAD, TAL & DIST: NASHIK-422213, MAHARASHTRA,INDIA

B. Tech Computer Sciences and Engineering(Specialization in Cyber Security and Forensic)
Semester – IV

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme (Hrs./Week)				Examination Scheme				Total Marks
				L	T	P	C	Formative Assessment CIA		Summative Assessment ESE		
								Theory	Lab	Theory	Lab	
1	PCC	NYCF401	Object Oriented Programming using Java	3	--	--	3	50	--	100	--	100
2	PCC	NYCF402	Database Management System	3	--	--	3	50	--	100	--	100
3	PCC	NYCF403	Computer Organization and Architecture	3	--	--	3	50	--	100	--	100
4	PCC	NYCF411	Database Management System Laboratory	--	--	2	1	--	50	--	50*	50
5	OE	NYCFO02	Open Elective-II	3			3	50	--	100	--	100
6	VSEC	NYCF412	Object Oriented Programming Laboratory	--	--	4	2	--	50	--	50*	50
7	MDM	------	Minor course 2 #	2	--	--	2	50	--	100	--	100
8	AEC	NHSA12	Strategic Communication for professionals	--	--	4	2	--	50	--	50*	50
9	EEMC (HSSM)	NYCF413	Personal Finance Management	--	--	4	2	--	50	--	50*	50
10	VEC (HSSM)	NYCF414	Innovation and Entrepreneurship	--	--	4	2	--	50	--	50*	50
TOTAL				**14**	**00**	**18**	**23**	**250**	**250**	**500**	**250**	**750**
Value Added Course												
11	VAC (VSEC)	------	MySql	--	--	2	--	--	25	--	--	25

		Formative Assessment		
CIA: Continuous Internal Assessment **L**: Theory Lecture **T**: Tutorial **P**: Practical **ESE**: End Semester Exam	*: Oral Examination **PCC**: Program Core course **PEC**: Programme elective Core **OE:**Open Elective **VAC:** Value Added Courses **AEC :**AbilityEnhancement curses **CEP/FP:**Communityencougement project/Field project **VSEC:** Vocational and Skill Enhancement Course **MDM:** Multidisciplinary minor course	**CIA**	**Weightage**	**Description**
		CIA 1	10%	Home Assignment
		CIA 2	20%	Written Exam
		CIA 3	10%	Seminar Presentation
		CIA 4	10%	• Behavioural Attitude + General Discipline (5%) • Theory + practical attendance 5%)
		TOTAL	**50%**	

Exit option:

- Award of UG Certificate in exiting the First Year programme after securing minimum 40 credits will be awarded UG Certificate in the Computer Sciences and Engineering (specialization in Artificial Intelligence and Machine Learning) provided they secure 8 credits in work-based vocational courses or internship / Apprenticeship offered during summer vacation in addition to 4 credit from skill based courses earn during first and second semester. **Refer Annexure 1**

- Award of UG Diploma in exiting the second Year programme after securing minimum 80 credits will be awarded UG Diploma in the Computer Sciences and Engineering (specialization in Artificial Intelligence and Machine Learning) provided they secure 8 credits in work-based vocational courses or internship / Apprenticeship offered during summer vacation in addition to 4 credit from skill based courses earn during first and second semester. **Refer Annexure 1**

SANDIP UNIVERSITY
SCHOOL OF COMPUTER SCIENCE & ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MAHIRAVANI, TRIMBAK ROAD, TAL & DIST: NASHIK-422213, MAHARASHTRA,INDIA

Annexure-1

Course Work (for Exit Criterion to UG Diploma)												
1	EC	NYCSX01	Prompt Engineering for Software Development	3	--	--	3	50	--	100	--	100
2	EC	NYCSX02	Python Programming for AI	3	--	--	3	50	--	100	--	100
3	EC	NYCSX03	Internship (2 Weeks)	--	--	--	2	--	50	--	--	50

SANDIP UNIVERSITY
SCHOOL OF COMPUTER SCIENCE & ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MAHIRAVANI, TRIMBAK ROAD, TAL & DIST: NASHIK-422213, MAHARASHTRA,INDIA

B. Tech Computer Sciences and Engineering(Specialization in Cyber Security and Forensic)

Semester – V

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme (Hrs./Week)				Examination Scheme				Total Marks
				L	T	P	C	Formative Assessment CIA		Summative Assessment ESE		
								Theory	Lab	Theory	Lab	
1	PCC	NYCF501	Theory of Computation	3	--	--	3	50	--	100	--	100
2	PCC	NYCF502	Operating System	3	--	--	3	50	--	100	--	100
3	PCC	NYCF503	Data Communication	3	--	--	3	50	--	100	--	100
4	PCC	NYCF511	Operating System Laboratory	--	--	2	1	--	50	--	50*	50
5	PEC	NYCFE--	Program Elective-I	3	--	--	3	50	--	100	--	100
6	OE	NYCFO03	Open Elective III	2	--	--	2	50	--	100	--	100
7	MDM	-------	Minor course 3 #	3	--	--	3	50	--	100	--	100
8	AEC	NHSA13	Essential Aptitude Skills	--	--	4	2	--	50	--	50*	50
TOTAL				**17**	**00**	**06**	**20**	**300**	**100**	**600**	**100**	**700**
Value Added Course (VAC)												
9	VAC	----------	Network Programming	--	--	2	--	--	50	--	--	50

		Formative Assessment		
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		CIA 1	10%	Home Assignment
		CIA 2	20%	Written Exam
		CIA 3	10%	Seminar Presentation
		CIA 4	10%	• Behavioural Attitude + General Discipline (5%) • Theory + practical attendance 5%)
		TOTAL	**50%**	

SANDIP UNIVERSITY
SCHOOL OF COMPUTER SCIENCE & ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MAHIRAVANI, TRIMBAK ROAD, TAL & DIST: NASHIK-422213, MAHARASHTRA,INDIA

B. Tech Computer Sciences and Engineering(Specialization in Cyber Security and Forensic)
Semester – VI

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme (Hrs./Week)				Examination Scheme				Total Marks
				L	T	P	C	Formative Assessment CIA		Summative Assessment ESE		
								Theory	Lab	Theory	Lab	
1	PCC	NYCF601	Design and Analysis of Algorithm	3	--	--	3	50	--	100	--	100
2	PCC	NYCF602	Operating System	3	--	--	3	50	--	100	--	100
3	PCC	NYCF603	Embedded System & Internet of Things	3	--	--	3	50	--	100	--	100
4	PCC	NYCF611	Design and Analysis of Algorithm laboratory	--	--	2	1	--	50	--	50*	50
5	VSEC	NYCF612	Operating System Lab	--	--	4	2		50		50*	50
7	PEC	NYCFE--	Program Elective-II	3	--	--	3	50	--	100	--	100
8	PEC	NYCFE--	Program Elective-III	3	--	--	3	50	--	100	--	100
9	MDM	---------	Minor Course 4#	2	--	--	2	100	--	100	--	100
10	AEC	NHSA14	Employability Skills and Career Advancement	--	--	4	2	--	50	--	50*	50
TOTAL				**17**	**00**	**10**	**22**	**350**	**150**	**600**	**150**	**750**
Value Added Course												
11	EEC	---------	Advanced Web Designing Course	--	--	2	--	--	50	--	--	50

		Formative Assessment		
CIA: Continuous Internal Assessment **L**: Theory Lecture **T**: Tutorial **P**: Practical **ESE**: End Semester Exam	*: Oral Examination **PCC**: Program Core course **PEC**: Programme elective Core **OE:**Open Elective **VAC:** Value Added Courses **AEC :**AbilityEnhancement curses **CEP/FP:**Communityencougement project/Field project **VSEC:** Vocational and Skill Enhancement Course **MDM:** Multidisciplinary minor course	**CIA**	**Weightage**	**Description**
		CIA 1	10%	Home Assignment
		CIA 2	20%	Written Exam
		CIA 3	10%	Seminar Presentation
		CIA 4	10%	• Behavioural Attitude + General Discipline (5%) • Theory + practical attendance 5%)
		TOTAL	**50%**	

Exit option:

- Students exiting the 3-year UG program will be awarded B.Voc. in the Computer Sciences and Engineering (Specialization in Artificial Intelligence and Machine Learning) upon securing minimum 120 credits with additional 8 credits in skill-based vocational courses (skill-based courses, internship, mini projects etc.) offered during summer vacation after the sixth semester. **Refer Annexure 2**

Annexure-2

Course Work (for Exit Criterion to UG Diploma) (B. Voc)												
1	EC	NYCSX04	Networking Essentials	3	--	--	3	50	--	100	--	100
2	EC	NYCSX05	Cloud Computing with Practical Applications	3	--	--	3	50	--	100	--	100
3	EC	NYCSX06	Internship (4 weeks)	--	--	--	2	--	50	--	--	50

SANDIP UNIVERSITY
SCHOOL OF COMPUTER SCIENCE & ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MAHIRAVANI, TRIMBAK ROAD, TAL & DIST: NASHIK-422213, MAHARASHTRA,INDIA

B. Tech Computer Sciences and Engineering(Specialization in Cyber Security and Forensic)
Semester – VII

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme (Hrs./Week)				Examination Scheme				Total Marks
				L	T	P	C	Formative Assessment CIA		Summative Assessment ESE		
								Theory	Lab	Theory	Lab	
1	PCC	NYCF701	Complier Design	3	--	--	3	50	--	100	--	100
2	PCC	NYCF702	Data Science and Machine Learning	3	--	--	3	50	--	100	--	100
3	PCC	NYCF----	Program Elective-IV	2	--		2	50		100		100
4	MDM	--------	Minor course 5 #	2	--	--	2	50	--	100	--	100
5	ELC	NYCF711	Industry Internship/OJT*	--	--	--	12	--	100	--	100*	200
6	AEC	NHSA15	Corporate Readiness and Entrepreneurial Excellence	--	--	4	2	--	50	--	50*	100
TOTAL				**10**	**00**	**04**	**24**	**200**	**150**	**400**	**150**	**700**
Value Added Course												
9	VAC	---------	Data Science Essentials	--	--	2	--	--	25	--	--	25

***45 Days Internship during summer vacation of 6th Semester**

		Formative Assessment		
CIA: Continuous Internal Assessment **L**: Theory Lecture **T**: Tutorial **P**: Practical **ESE**: End Semester Exam	*: Oral Examination **PCC**: Program Core course **PEC**: Programme elective Core **OE:**Open Elective **VAC:** Value Added Courses **AEC :**AbilityEnhancement curses **CEP/FP:**Communityencougement project/Field project **VSEC:** Vocational and Skill Enhancement Course **MDM:** Multidisciplinary minor course	**CIA**	**Weightage**	**Description**
		CIA 1	10%	Home Assignment
		CIA 2	20%	Written Exam
		CIA 3	10%	Seminar Presentation
		CIA 4	10%	• Behavioural Attitude + General Discipline (5%) • Theory + practical attendance 5%)
		TOTAL	**50%**	

SANDIP UNIVERSITY
SCHOOL OF COMPUTER SCIENCE & ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MAHIRAVANI, TRIMBAK ROAD, TAL & DIST: NASHIK-422213, MAHARASHTRA,INDIA

B. Tech Computer Sciences and Engineering(Specialization in Cyber Security and Forensic)
Semester – VIII

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme (Hrs./Week)				Examination Scheme				Total Marks
				L	T	P	C	Formative Assessment CIA		Summative Assessment ESE		
								Theory	Lab	Theory	Lab	
1	PCC	NYCF801	Cryptography and Security	3	--	--	3	50	--	100	--	100
2	PCC	NYCF802	High Performance Computing	3	--	--	3	50	--	100	--	100
3	PEC	NYCFE----	Program Elective V	3	--	--	3	50	--	100	--	100
4	PEC	NYCFE----	Program Elective VI	3	--	--	3	50	--	100	--	100
5	ELC	NRDP101	Research Methodology	4	--	--	4	50	--	100	--	100
6	ELC	NYCF811	Project	--	--	8	4	--	50	--	100*	100
7	MDM	----------	Minor Course 6#	2	--	--	2	50	--	100	--	100
TOTAL				**18**	**00**	**08**	**22**	**300**	**100**	**600**	**100**	**700**
Value Added Course												
8	VAC	---------	Soft Computing Lab	--	--	2	--	--	--	--	--	--

CIA: Continuous Internal Assessment
L: Theory Lecture
T: Tutorial
P: Practical
ESE: End Semester Exam

*: Oral Examination
PCC: Program Core course
PEC: Programme elective Core
OE: Open Elective
VAC: Value Added Courses
AEC : AbilityEnhancement curses
CEP/FP: Communityencougement project/Field project
VSEC: Vocational and Skill Enhancement Course
MDM: Multidisciplinary minor course

Formative Assessment

CIA	Weightage	Description
CIA 1	10%	Home Assignment
CIA 2	20%	Written Exam
CIA 3	10%	Seminar Presentation
CIA 4	10%	• Behavioural Attitude + General Discipline (5%) • Theory + practical attendance 5%)
TOTAL	**50%**	

Credit distribution

1

Semester		Total Credits as per GR	Total Credits SUN CSE-CSF
Basic Science Course	BSC/ESC	14-18	16
Engineering Science Course		16-12	12
Programme Core Course (PCC)	Program Courses	44-56	60
Programme Elective Course (PEC)		20	17
Multidisciplinary Minor (MD M)	Multidisciplinary Courses	14	14
Open Elective (OE) Other than a particular program		08	8
Vocational and Skill Enhancement Course (VSEC)	Skill Courses	08	08
Ability Enhancement Course (AEC -01, AEC-02)	Humanities Social Science and Management (HSSM)	04	14
Entrepreneurship/ Economics / Management Course		04	
Indian knowledge System (IKS)		02	
Value Education Course (VEC)		04	
Research Methedology	Experiential Learning Courses	04	04
Comm. Engg. Project (CEP) / Field Project (FP)		02	02
Project		04	04
Internship/ OJT		12	12
Co-curricular Course (CC)	Liberal Learning Courses	04	04
Total Credits (Major)		**160-176**	**175**