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.

Assessment for Theory Course *(Scaled to allotted marks)*		
CIA	**Weightage Marks**	**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 :**Ability Enhancement courses **CEP/FP:** Community engagement 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%	• Behavioral Attitude + General Discipline (5%) • Theory + practical attendance 5%)
		TOTAL	**50%**	

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Multidisciplinary Minor offered by Computer Science & Engineering Department Minor in Artificial Intelligence & Machine Learning

Sr.No.	Course Name	Course Code	Scheme	Credits	Semester
1	Artificial Intelligence	NYCMM01	2-0-0	2	3rd
2	Machine Learning	NYCMM02	2-0-0	2	4th
3	Natural Language Processing	NYCMM03	3-0-0	3	5th
4	Optimization Technique	NYCMM04	2-0-0	2	6th
5	Deep Learning for Computer Vision	NYCMM05	2-0-0	2	7th
6	Quantum Computing	NYCMM06	2-0-0	2	8th
TOTAL				**14**	

Honors Courses offered by Computer Science & Engineering Department Minor in Artificial Intelligence & Machine Learning

Sr.No.	Course Name	Course Code	Scheme	Credits	Semester
1	Supervised and Unsupervised Learning	NYCMH01	3-0-0	3	5th
2	Natural language Programming	NYCMH02	3-0-0	3	5th
3	Optimization Techniques	NYCMH03	3-0-0	3	6th
4	Soft Computing	NYCMH04	3-0-0	3	6th
5	Social Network Analysis	NYCMH05	3-0-0	3	7th
6	Game Theory	NYCMH06	3-0-0	3	8th
TOTAL				**18**	

Open Electives offered by Computer Science & Engineering Department in Artificial Intelligence & Machine Learning

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	

Programme Elective Courses offered by Computer Science & Engineering Department in Artificial Intelligence & Machine Learning

Sr.No.	Programme Elective Courses#	Course Name	Course Code	Scheme	Credits	Semester
1	PEC#1	Artificial intelligence	NYCME01	3-0-0	3	V
2	PEC#1	Pattern Recognition	NYCME02	3-0-0		V
3	PEC#2	Machine Learning	NYCME03	3-0-0	3	VI
4	PEC#2	Web Programming	NYCME04	3-0-0		VI
5	PEC#3	Deep Learning	NYCME05	3-0-0	3	VI
6	PEC#3	Information Storage and Retrieval	NYCME06	3-0-0		VI
7	PEC#4	Quantum Machine Learning	NYCME07	2-0-0	3	VII
8	PEC#4	Cognitive Computing	NYCME08	2-0-0		VII
9	PEC#5	Internet of Things	NYCME09	3-0-0	3	VIII
10	PEC#5	Mobile Computing	NYCME10	3-0-0		VIII
11	PEC#6	Speech and Video Processing	NYCME11	3-0-0	3	VIII
12	PEC#6	Computer Vision	NYCME12	3-0-0		VIII
TOTAL					**18**	

B. Tech. Computer Science and Engineering(Specialization in Artificial Intelligence & Machine Learning)
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	NYCM301	Discrete Mathematics and Logic	3	--	--	3	50	--	100	--	100
2	PCC	NYCM302	Knowledge Representation and Reasoning	3	--	--	3	50	--	100	--	100
3	PCC	NYCM303	Data Structures	3	--	--	3	50	--	100	--	100
4	PCC	NYCM311	Data Structures Laboratory	--	--	2	1	--	50	--	50*	50
5	MDM		Minor Course #1 (Introduction to Embedded System)	2	--		2	50	--	100	--	100
6	OE		Open Elective-I	3	--	--	3	50	--	100	--	100
7	AEC (HSSM)	NHSA11	Key Competencies for Career Growth	--	--	4	2		50		50*	50
8	VEC	NLWV01	The Constitution & Human Rights	2	--	--	2	50	--	100	--	100
9	CEP	NYCM312	Community Engineering Project	--	--	4	2	--	50		50*	50
TOTAL				**16**	**00**	**10**	**21**	**300**	**150**	**600**	**150**	**750**
Value Added Course												
10	VAC		Programming in C++	--	--	2	--	--	25	--	--	25

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

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B. Tech. Computer Science and Engineering(Specialization in Artificial Intelligence & Machine Learning)
Semester – IV

S 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	NYCM401	Object Oriented Programming using Java	3	--	--	3	50	--	100	--	100
2	PCC	NYCM402	Database Management System	3	--	--	3	50	--	100	--	100
3	PCC	NYCM403	Computer Organization and Architecture	3	--	--	3	50	--	100	--	100
4	PCC	NYCM411	Database Management System Laboratory	--	--	2	1	--	50	--	50*	50
5	MDM		Minor course 2 #	2	--	--	2	50	--	100	--	100
6	OE		Open Elective-II	3			3	50	--	100	--	100
7	VSEC	NYCM412	Object Oriented Programming using Java Laboratory	--	--	4	2	--	50	--	50*	50
8	AEC (HSSM)	NHSA12	Strategic Communication for professionals	--	--	4	2	--	50	--	50*	50
9	EEMC (HSSM)	NYCM413	Personal Finance Management	--	--	4	2	--	50	--	50*	50
10	VEC (HSSM)	NYCM414	Innovation and Entrepreneurship	--	--	4	2	--	50	--	50*	50
TOTAL				**14**	**00**	**18**	**23**	**250**	**250**	**500**	**250**	**750**
Value Added Course (Any One)												
11	VAC (VSEC)		Advanced Python Programming	--	--	2	--	--	25	--	--	25

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		CIA 1	10%	Home Assignment
		CIA 2	20%	Written Exam
		CIA 3	10%	Seminar Presentation
		CIA 4	10%	• Behavioral 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**

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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

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B. Tech. Computer Science and Engineering (Specialization in Artificial Intelligence & Machine Learning)

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	NYCM501	Theory of Computation	3	--	--	3	50	--	100	--	100
2	PCC	NYCM502	Operating System	3	--	--	3	50	--	100	--	100
3	PCC	NYCM503	Data Communication	3	--	--	3	50	--	100	--	100
4	PCC	NYCM411	Operating System Laboratory	--	--	2	1	--	50	--	50*	50
5	PEC	NYCME_	Program Elective-I	3	--	--	3	50	--	100	--	100
6	OE		Open Elective III	2	--	--	2	50	--	100	--	100
7	MDM		Minor course 3 #	3	--	--	3	50	--	100	--	100
8	AEC (HSSM)	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	--	--	25	--	--	25

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

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B. Tech. Computer Science and Engineering (Specialization in Artificial Intelligence & Machine Learning)
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	NYCM601	Design and Analysis of Algorithm	3	--	--	3	50	--	100	--	100
2	PCC	NYCM602	Computer Networks	3	--	--	3	50	--	100	--	100
3	PCC	NYCM603	Software Engineering	3	--	--	3	50	--	100	--	100
4	PCC	NYCM611	Design and Analysis of Algorithm Laboratory	--	--	2	1		50		50*	50
5	PEC	NYCME_	Program Elective-II	3	--	--	3	50	--	100	--	100
6	PEC	NYCME_	Program Elective-III	3	--	--	3	50	--	100	--	100
7	MDM		Minor Course 4#	2	--	--	2	50	--	100	--	100
8	VSEC	NYCM612	Computer Networks Laboratory	--	--	4	2		50		50*	50
9	AEC (HSSM)	NHSA14	Employability Skills and Career Advancement	--	--	4	2	--	50	--	50*	50
TOTAL				**17**	--	**10**	**22**	**300**	**150**	**600**	**150**	**750**
Value Added Course												
10	VAC		Machine Learning-A Practical Approach	--	--	2	--	--	25	--	--	25

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		Formative Assessment		
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		CIA 1	10%	Home Assignment
		CIA 2	20%	Written Exam
		CIA 3	10%	Seminar Presentation
		CIA 4	10%	• Behavioral 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	NYCMX04	Networking Essentials	3	--	--	3	50	--	100	--	100
2	EC	NYCSX05	Machine Learning with Practical Applications	3	--	--	3	50	--	100	--	100
3	EC	NYCSX06	Internship (4 weeks)	--	--	--	2	--	50	--	--	50

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B. Tech. Computer Science and Engineering (Specialization in Artificial Intelligence & Machine Learning)
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	NYCM701	Complier Design	3	--	--	3	50	--	100	--	100
2	PCC	NYCM702	Data Science and Machine Learning	3	--	--	3	50	--	100	--	100
3	PEC	NYCME_	Program Elective-IV	3	--	--	3	50	--	100	--	100
4	MDM		Minor course 5 #	2	--	--	2	50	--	100	--	100
5	ELC	NYCM711	Internship	--	--	--	12	--	100	--	100*	200
6	AEC (HSSM)	NHSA15	Corporate Readiness and Entrepreneurial Excellence	--	--	4	2	--	50	--	50*	100
TOTAL				**10**	**00**	**04**	**25**	**200**	**150**	**400**	**150**	**700**
Value Added Course												
7	VAC		Data Science Essentials	--	--	2	--	--	25	--	--	25

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

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

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B. Tech Artificial Intelligence & Machine Learning
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	NYCM801	Cryptography and Security	3	--	--	3	50	--	100	--	100
2	PCC	NYCM802	High Performance Computing	3	--	--	3	50	--	100	--	100
3	PEC	NYCME_	Program Elective V	3	--	--	3	50	--	100	--	100
4	PEC	NYCME_	Program Elective VI	3	--	--	3	50	--	100	--	100
5	RM	NRDP101	Research Methodology	4	--	--	4	50	--	100	--	100
6	ELC	NYCM811	Project	--	--	8	4	--	50	--	100*	150
7	MDM		Minor Course 6#	3	--	--	3	50	--	100	--	100
TOTAL				**18**	**00**	**08**	**23**	**300**	**100**	**600**	**100**	**800**
Value Added Course												
8	VAC		Cryptography-Practical Approach			2			25			25

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

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Credit distribution

1

Semester		Total Credits as per GR	Total Credits SUN CSE-AIML
Basic Science Course	BSC/ESC	14-18	16
Engineering Science Course		16-12	12
Programme Core Course (PCC)	Program Courses	44-56	52
Programme Elective Course (PEC)		20	18
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	12
Entrepreneurship/ Economics / Management Course		04	02
Indian knowledge System (IKS)		02	02
Value Education Course (VEC)		04	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**	**174**

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