DIVISION OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

REVISED CURRICULUM

B. Tech Computer Science and Engineering (Artificial Intelligence and Machine Learning) (2022-2023 Batch)

Table 1 PROGRAMME STRUCTURE

#	COURSE COMPONENTS	Credits
1	Humanities and Social Sciences including Management Courses	5
2	Entrepreneurship Courses	7
3	Basic Science Courses	16
4	Engineering Science Courses	14
5	Professional Core Courses	74.5
6	Professional Elective Courses	21
7	Skill Based Courses	2
8	Open Subjects	6
9	Online Courses	5*
10	Mini Project / Internship / Project	15
	Mandatory Courses [Environment Studies, Induction Programme, Indian Constitution, Value Education, etc.]	0
Total		**160.5+5***

**The students shall earn 5 credits through online courses between 2nd and 7th semester (both inclusive)*

Table 1.1 Humanities and Social Sciences including Management Courses						
[HSMC] - 5 credits						
S.N.	**Course Code**	**Course Title**	**Hours per week**			**Credits**
			L	**T**	**P**	
1	NPTEL	English / French / German / Japanese	2	0	0	2
2	20CS2024	Ethics in Information Technology	2	0	0	2
3	20MS2005	Soft Skills	1	0	0	1
					Total Credits	**5**
Table 1.2 Entrepreneurship Courses						
[EC] - 7 credits						
S.N.	**Course Code**	**Course Title**	**Hours per week**			**Credits**
			L	**T**	**P**	
1	20MS2003	Concepts of Entrepreneurship	1	0	0	1
2	20MS2004	Entrepreneurship and Product Development	3	0	0	3
3	20MS2007	Business Plan	3	0	0	3
					Total Credits	**7**
Table 1.3 Basic Sciences Courses						
[BSC] - 16 credits						
S.N.	**Course Code**	**Course Title**	**Hours per week**			**Credits**

			L	T	P	
1	20MA1006	Calculus, Vector Spaces and Laplace Transform	3	1	0	4
2	20MA2005	Discrete Structures	3	1	0	4
3	20MA1005	Mathematical Foundations of Computing	3	1	0	4
4	20MA2004	Partial Differential Equations, Probability and Statistics	3	1	0	4
					Total Credits	**16**

Table 1.4 Engineering Science Courses

[ESC] – 14 credits

S.N.	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	20CS2009	Computer Organization and Architecture	3	0	0	3
2	21CS2017	Pattern Matching and Anomaly Detection	3	0	0	3
3	18EC2003	Digital System Design	3	0	0	3
4	18EC2004	Digital System Design Lab	0	0	2	1
5	18EC2028	Microprocessor and Microcontroller	3	0	0	3
6	18EC2029	Microprocessor and Microcontroller Lab	0	0	2	1
					Total Credits	**14**

Table 1.5 Professional Core Courses

[PCC] – 76 credits

S.N.	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	20CS1001	Programming for Problem Solving	3	0	3	4.5
2	20CS2007	Computer Communication Networks	3	0	3	4.5
3	20CS2010	Cryptography and Network Security	3	0	2	4
4	20CS2013	Data Structures and Algorithms	3	0	3	4.5
5	20CS2016	Database Management Systems	3	0	3	4.5
6	20CS2018	Design and Analysis of Algorithms	3	0	3	4.5
7	20CS2030	Internet of Things	3	0	3	4.5
8	23CS2028	Machine Learning Techniques	3	0	0	3
9	23CS2029	Machine Learning Techniques Lab	0	0	3	1.5
10	23AI2006	Cyber Threat Intelligence and Analytics	3	0	0	3
11	23AI2011	Software Engineering for Artificial Intelligence Systems	3	0	0	3
12	23AI2004	Conversational Artificial Intelligence	3	0	0	3
13	23AI2005	Conversational Artificial Intelligence Lab	0	0	3	1.5
14	20CS2035	Object Oriented Programming	3	0	3	4.5
15	20CS2036	Operating Systems	3	0	3	4.5
16	20CS1002	Python Programming	3	0	3	4.5
17	20CS2054	Theory of Computation	3	0	0	3
18	20CS2056	Web Technology	3	0	3	4.5

19	21CS2007	Artificial Intelligence: Principles and Techniques	3	0	0	3
20	20CS2031	Introduction to Data Science	3	0	3	4.5
					Total Credits	**74.5**

Table 1.6 Mini Project / Internship / Project

S.N.	**Course Code**	**Course Title**	**Hours per week**			**Credits**
			L	**T**	**P**	
1	SIP2921	Summer Internship	0	0	2	1
2	MP2911	Mini Project	0	0	4	2
3	22AI2999	Project	0	0	18	12
					Total Credits	**15**

Open Elective	**6**
Online Courses	**5**
Skill Based Courses	**2**
Professional Elective	**21**
Grand Total	**165.5**

SEMESTER-WISE CURRICULUM

Table 2 Curriculum

Course Code	**Course Title**	**L**	**T**	**P**	**Credits**
Semester-1					
NPTEL	English / French / German / Japanese	2	0	0	2
20CS2024	Ethics in Information Technology	2	0	0	2
20MA1005	Mathematical Foundations of Computing	3	1	0	4
20CS1001	Programming for Problem Solving	3	0	3	4.5
18EC2003	Digital System Design	3	0	0	3
18EC2004	Digital System Design Lab	0	0	2	1
	Mandatory Course I				
Total					**16.5**
Semester-2					
20MA1006	Calculus, Vector Spaces and Laplace Transform	3	1	0	4
20CS1002	Python Programming	3	0	3	4.5
20CS2030	Internet of Things	3	0	3	4.5
18EC2028	Microprocessor and Microcontroller	3	0	0	3
18EC2029	Microprocessor and Microcontroller Lab	0	0	2	1
20MS2003	Concepts of Entrepreneurship	1	0	0	1
	Mandatory Course II				
Total					**18**
Semester-3					
20MA2004	Partial Differential Equations, Probability and Statistics	3	1	0	4
21CS2007	Artificial Intelligence: Principles and Techniques	3	0	0	3

20CS2013	Data Structures and Algorithms	3	0	3	4.5
20CS2035	Object Oriented Programming	3	0	3	4.5
20CS2009	Computer Organization and Architecture	3	0	0	3
20MS2004	Entrepreneurship and Product Development	3	0	0	3
Total					**22**
Semester-4					
20MA2005	Discrete Structures	3	1	0	4
20CS2018	Design and Analysis of Algorithms	3	0	3	4.5
20CS2036	Operating Systems	3	0	3	4.5
20CS2007	Computer Communication Networks	3	0	3	4.5
20MS2007	Business Plan	3	0	0	3
MP2921/ SIP2921	Mini Project / Summer Internship - I	0	0	2	1
20MS2005	Soft Skills	1	0	0	1
Total					**22.5**
Semester-5					
20CS2016	Database Management Systems	3	0	3	4.5
21CS2017	Pattern Matching and Anomaly Detection	3	0	0	3
20CS2031	Introduction to Data Science	3	0	3	4.5
20CS2057	Web Technology	3	0	3	4.5
20CS2055	Theory of Computation	3	0	0	3
	Professional Elective-1	3	0	0	3
Total					**22.5**
Semester-6					
23AI2006	Cyber Threat Intelligence and Analytics	3	0	0	3
20CS2010	Cryptography and Network Security	3	0	2	4
23CS2028	Machine Learning Techniques	3	0	0	3
23AI2011	Software Engineering for Artificial Intelligence Systems	3	0	0	3
	Professional Elective-2	3	0	0	3
	Open Elective - 1	3	0	0	3
23CS2029	Machine Learning Techniques Lab	0	0	3	1.5
24AIXXXX	Skill Based Course - I	0	0	2	1
MP2911	Mini Project	0	0	4	2
Total					**23.5**
Semester-7					
23AI2004	Conversational Artificial Intelligence	3	0	0	3
	Open Elective - 2	3	0	0	3
	Professional Elective-3	3	0	0	3
	Professional Elective-4	3	0	0	3
	Professional Elective-5	3	0	0	3
	Professional Elective-6	3	0	0	3
	Professional Elective-7	3	0	0	3
23AI2005	Conversational Artificial Intelligence Lab	0	0	3	1.5
24AIXXXX	Skill Based Course - II	0	0	2	1

Total					**23.5**
Semester-8					
22AI2999	Project	0	0	18	12
	Total				**12**
	Online Course				5*
Grand Total					**165.5**

REVISED CURRICULUM

B. Tech. Computer Science and Engineering (Artificial Intelligence)
(2022-2023 Batch)
Table 1 PROGRAMME STRUCTURE

#	COURSE COMPONENTS	Credits
1	Humanities and Social Sciences including Management Courses	5
2	Entrepreneurship Courses	7
3	Basic Science Courses	16
4	Engineering Science Courses	14
5	Professional Core Courses	75.5
6	Professional Elective Courses	21
	Skill Based Courses	1
7	Open Subjects	6
8	Online Courses	5*
9	Mini Project / Internship / Project	15
10	Mandatory Courses [Environment Studies, Induction Programme, Indian Constitution, Value Education, etc.]	0
Total		**160.5+5***

**The students shall earn 5 credits through online courses between 2nd and 7th semester (both inclusive)*

Table 1.1 Humanities and Social Sciences including Management Courses						
[HSMC] - 5 credits						
S.N.	**Course Code**	**Course Title**	**Hours per week**			**Credits**
			L	**T**	**P**	
1	NPTEL	English / French / German / Japanese	2	0	0	2
2	20CS2024	Ethics in Information Technology	2	0	0	2
3	20MS2005	Soft Skills	1	0	0	1
					Total Credits	**5**

Table 1.2 Entrepreneurship Courses						
[EC] - 7 credits						
S.N.	**Course Code**	**Course Title**	**Hours per week**			**Credits**
			L	**T**	**P**	

1	20MS2003	Concepts of Entrepreneurship	1	0	0	1
2	20MS2004	Entrepreneurship and Product Development	3	0	0	3
3	20MS2007	Business Plan	3	0	0	3
					Total Credits	**7**

Table 1.3 Basic Sciences Courses

[BSC] - 16 credits

S.N.	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	20MA1006	Calculus, Vector Spaces and Laplace Transform	3	1	0	4
2	20MA2005	Discrete Structures	3	1	0	4
3	20MA1005	Mathematical Foundations of Computing	3	1	0	4
4	20MA2004	Partial Differential Equations, Probability and Statistics	3	1	0	4
					Total Credits	**16**

Table 1.4 Engineering Science Courses

[ESC] – 14 credits

S.N.	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	20CS2009	Computer Organization and Architecture	3	0	0	3
2	23AI2009	Essentials of Generative Artificial Intelligence	3	0	0	3
3	18EC2003	Digital System Design	3	0	0	3
4	18EC2004	Digital System Design Lab	0	0	2	1
5	18EC2028	Microprocessor and Microcontroller	3	0	0	3
6	18EC2029	Microprocessor and Microcontroller Lab	0	0	2	1
					Total Credits	**14**

Table 1.5 Professional Core Courses

[PCC] – 77 credits

S.N.	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	20CS1001	Programming for Problem Solving	3	0	3	4.5
2	20CS2007	Computer Communication Networks	3	0	3	4.5
3	20CS2010	Cryptography and Network Security	3	0	2	4
4	20CS2013	Data Structures and Algorithms	3	0	3	4.5
5	20CS2016	Database Management Systems	3	0	3	4.5
6	20CS2018	Design and Analysis of Algorithms	3	0	3	4.5
7	20CS2030	Internet of Things	3	0	3	4.5
8	23CS2028	Machine Learning Techniques	3	0	0	3
9	23CS2029	Machine Learning Techniques Lab	0	0	3	1.5
10	20CS2035	Object Oriented Programming	3	0	3	4.5

11	20CS2036	Operating Systems	3	0	3	4.5
12	20CS1002	Python Programming	3	0	3	4.5
13	23AI2011	Software Engineering for Artificial Intelligence Systems	3	0	0	3
14	20CS2046	Robotic Process Automation	3	0	2	4
15	23AI2004	Conversational Artificial Intelligence	3	0	0	3
16	23AI2005	Conversational Artificial Intelligence Lab	0	0	3	1.5
17	20CS2054	Theory of Computation	3	0	0	3
18	20CS2056	Web Technology	3	0	3	4.5
19	21CS2007	Artificial Intelligence: Principles and Techniques	3	0	0	3
20	20CS2031	Introduction to Data Science	3	0	3	4.5
					Total Credits	**75.5**

Table 1.6 Mini Project / Internship / Project

S.N.	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	SIP2921	Summer Internship	0	0	2	1
2	MP2911	Mini Project	0	0	4	2
3	22AI2999	Project	0	0	18	12
					Total Credits	**15**

Open Elective	**6**
Online Courses	**5**
Skill Based Course	**1**
Professional Elective	**21**
Grand Total	**165.5**

SEMESTER-WISE CURRICULUM

Table 2 Curriculum

Course Code	Course Title	L	T	P	Credits
Semester-1					
NPTEL	English / French / German / Japanese	2	0	0	2
20CS2024	Ethics in Information Technology	2	0	0	2
20MA1005	Mathematical Foundations of Computing	3	1	0	4
20CS1001	Programming for Problem Solving	3	0	3	4.5
18EC2003	Digital System Design	3	0	0	3
18EC2004	Digital System Design Lab	0	0	2	1
	Mandatory Course I				
Total					**16.5**
Semester-2					
20MA1006	Calculus, Vector Spaces and Laplace Transform	3	1	0	4
20CS1002	Python Programming	3	0	3	4.5
20CS2030	Internet of Things	3	0	3	4.5

18EC2028	Microprocessor and Microcontroller	3	0	0	3
18EC2029	Microprocessor and Microcontroller Lab	0	0	2	1
20MS2003	Concepts of Entrepreneurship	1	0	0	1
	Mandatory Course II				
Total					**18**
Semester-3					
20MA2004	Partial Differential Equations, Probability and Statistics	3	1	0	4
21CS2007	Artificial Intelligence: Principles and Techniques	3	0	0	3
20CS2013	Data Structures and Algorithms	3	0	3	4.5
20CS2035	Object Oriented Programming	3	0	3	4.5
20CS2009	Computer Organization and Architecture	3	0	0	3
20MS2004	Entrepreneurship and Product Development	3	0	0	3
Total					**22**
Semester-4					
20MA2005	Discrete Structures	3	1	0	4
20CS2018	Design and Analysis of Algorithms	3	0	3	4.5
20CS2036	Operating Systems	3	0	3	4.5
20CS2007	Computer Communication Networks	3	0	3	4.5
20MS2007	Business Plan	3	0	0	3
MP2921/ SIP2921	Mini Project / Summer Internship - I	0	0	2	1
20MS2005	Soft Skills	1	0	0	1
Total					**22.5**
Semester-5					
20CS2016	Database Management Systems	3	0	3	4.5
20CS2046	Robotic Process Automation	3	0	2	4
20CS2031	Introduction to Data Science	3	0	3	4.5
20CS2057	Web Technology	3	0	3	4.5
20CS2055	Theory of Computation	3	0	0	3
	Professional Elective-1	3	0	0	3
Total					**23.5**
Semester-6					
23AI2009	Essentials of Generative Artificial Intelligence	3	0	0	3
20CS2010	Cryptography and Network Security	3	0	2	4
23CS2028	Machine Learning Techniques	3	0	0	3
23AI2011	Software Engineering for Artificial Intelligence Systems	3	0	0	3
	Professional Elective-2	3	0	0	3
	Open Elective - 1	3	0	0	3
24AIXXXX	Skill Based Course - I	0	0	2	1
23CS2029	Machine Learning Techniques Lab	0	0	3	1.5
MP2911	Mini Project	0	0	4	2
Total					**23.5**
Semester-7					

23AI2004	Conversational Artificial Intelligence	3	0	0	3
23AI2005	Conversational Artificial Intelligence Lab	0	0	3	1.5
	Open Elective - 2	3	0	0	3
	Professional Elective-3	3	0	0	3
	Professional Elective-4	3	0	0	3
	Professional Elective-5	3	0	0	3
	Professional Elective-6	3	0	0	3
	Professional Elective-7	3	0	0	3
Total					**22.5**
Semester-8					
22AI2999	Project	0	0	24	12
	Total				**12**
	Online Course				5*
Grand Total					**165.5**