

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Scheme of UG Autonomous Program – 2023 batch (3rd to 8th Semester)

III SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	MAT23301X	Discrete Mathematics and Graph Theory	BS	TD - MAT	2	2	0	50	50	100	3
2	CSE23302	Data Structures and Algorithm	PC	TD – AIML /PSB - CSE	3	0	0	50	50	100	3
3	AML23303	Python Programming (Integrated)	IPC	TD - AIML	3	0	2	50	50	100	4
4	AML23304	Computer Organization and Operating System	PC		2	2	0	50	50	100	3
5	AML23305	Machine Learning Foundation	ETC		2	2	0	50	50	100	3
6	SCK23306	Social Connect and Responsibility	Any Department		0	0	2	100	---	100	1
7	AML23307	Web Application Frameworks	AEC		3	0	0	50	50	100	3
8	NSK23308	National Service Scheme (NSS)	MC	NSS coordinator	0	0	2	100	---	100	
	PEK23308	Physical Education (PE) (Sports and Athletics)		Physical Education Director							
	YOK23308	Yoga		Yoga Teacher							
9	CSEL23309	Data Structures Laboratory	PCL	TD – AIML /PSB - CSE	0	0	2	50	50	100	1
Total								550	350	900	20

IV SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	MAT23401X	Probability and Linear Algebra	BS	TD - MAT	2	2	0	50	50	100	3
2	CSE23402	Design and Analysis of Algorithms	PC	TD – AIML /PSB - CSE	3	0	0	50	50	100	3
3	AML23403	Database Management Systems (Integrated)	IPC	TD - AIML	3	0	2	50	50	100	4
4	AML23404	Machine Learning Techniques	PC		2	2	0	50	50	100	3
5	AML23405	Object Oriented Programming using Java	ETC		2	2	0	50	50	100	3
6	UHK23406	Universal human values course	UHV		1	0	0	50	50	100	1
6	AML23407	AI Tools, Frameworks & its Application I	AEC		2	0	2	50	50	100	3
7	NSK23408	National Service Scheme (NSS)	MC	NSS coordinator	0	0	2	100	---	100	
	PEK23408	Physical Education (PE) (Sports and Athletics)		Physical Education Director							
	YOK23408	Yoga		Yoga Teacher							
8	CSEL23409	Algorithms Laboratory	PCL	TD – AIML /PSB - CSE	0	0	2	50	50	100	1
Total								500	400	900	20

V SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	22AML51	Engineering Economics & Management	HSMS	TD – AIML PSB-AIML	3	0	0	50	50	100	3
2	22AML52	Deep Learning Principles & Practices (Integrated)	IPC	TD – AIML PSB-AIML	3	0	2	50	50	100	4
3	22AML53	Big data Analytics	PC	TD – AIML PSB-AIML	4	0	0	50	50	100	4
4	22AMLL54	Big data Analytics LAB	PCL	TD – AIML PSB-AIML	0	0	2	50	50	100	1
5	22AML55X	Program Elective 1	PEC	TD – AIML PSB-AIML	3	0	0	50	50	100	3
6	22AML56	Mini Project	PROJ	TD – AIML PSB-AIML	0	0	4	100	---	100	2
7	22RMIK57	Research Methodology and IPR	AEC	TD – AIML PSB-HSS	2	2	0	50	50	100	3
8	22CIVK58	Environmental Studies	MC	TD – AIML PSB-CV	2	0	0	50	50	100	2
9	22NSK59	National Service Scheme (NSS)	MC	NSS coordinator	0	0	2	100	---	100	0
	22PEK59	Physical Education (PE) (Sports and Athletics)		Physical Education Director							
	22YOK59	Yoga		Yoga Teacher							
Total								500	300	800	22

Program Elective 1*			
22AML55A	Full Stack Development	22AML55C	Foundation of Data Science
22AML55B	Microcontroller and Embedded System	22AML55D	Computer Networks

***NPTEL for Credit transfer:** Students can take 12 weeks NPTEL course as an equivalent to Program elective. The NPTEL courses of duration less than 12 weeks will not be considered for credit transfer. The courses (only technical) taken are as per the recommendation of BOS of respective department. The similarity of the contents as offered by NPTEL should not exceed a maximum of 40% of the courses being registered by the student. The NPTEL course need to be completed before the registration of the elective. Any certificate obtained after the registration of elective would not be considered. The validity of NPTEL certificate is for two years and it cannot be used more than once to avail the benefit. The student is eligible to transfer a maximum of nine credits in the entire duration of the program. The grades will be awarded as equivalent to the grades obtained in the NPTEL course.

VI SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	22AML61	Cloud Computing	IPC	TD – AIML PSB-AIML	3	0	2	50	50	100	4
2	22AML62	Image Analytics with Computer Vision	PC	TD – AIML PSB-AIML	4	0	0	50	50	100	4
3	22AML63X	Program Elective 2	PEC	TD – AIML PSB-AIML	3	0	0	50	50	100	3
4	22AML64X	Open Elective 1	OEC	TD – AIML PSB-AIML	3	0	0	50	50	100	3
5	22AML65	Project Phase 1	PROJ	TD – AIML PSB-AIML	0	0	4	100	--	100	2
6	22AMLL66	Image Analytics with Computer Vision LAB	PCL	TD – AIML PSB-AIML	0	0	2	50	50	100	1
7	22AML67X	Ability Enhancement Course	AEC	TD – AIML PSB-AIML	0	0	2	50	50	100	1
8	22NSK68	National Service Scheme (NSS)	MC	NSS coordinator	0	0	2	100	---	100	0
	22PEK68	Physical Education (PE) (Sports and Athletics)		Physical Education Director							
	22YOK68	Yoga		Yoga Teacher							
9	22IKSK69	Indian Knowledge System	IKS	HSS	1	0	0	100	0	100	0
10	22UHV69	Universal Human Values	UHV	HSS	1	0	0	100	0	100	0
Total								700	300	1000	18

Program Elective 2*

22AML63A	Parallel and Distributed computing	22AML63C	Artificial Intelligence in Block Chain
22AML63B	Intelligent Embedded System	22AML63D	Time Series Analysis
Open Elective 1 (Offered to other branch students)			
22AML64A	Next-Gen Database Technology using MongoDB		
Ability Enhancement Course/Skill Enhancement Course			
22AML67A	AI Tools, Frameworks & its Application II		

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VII SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	22AML71	Natural Language Processing	IPC	TD – AIML PSB-AIML	3	0	2	50	50	100	4
2	22AML72	Quantum Computing	IPC	TD – AIML PSB-AIML	3	0	2	50	50	100	4
3	22AML73	Business Intelligence	PC	TD – AIML PSB-AIML	3	2	0	50	50	100	4
4	22AML74X	Program Elective 3	PEC	TD – AIML PSB-AIML	3	0	0	50	50	100	3
5	22AML75X	Open Elective 2	OEC	TD – AIML PSB-AIML	3	0	0	50	50	100	3
6	22AML76	Major Project Phase-II	Any Department	TD – AIML PSB-AIML	0	0	12	100	100	200	6
Total								400	300	700	24

Program Elective 3*			
22AML74A	Datamining and Data warehousing	22AML74C	Human Computer Interaction
22AML74B	Introduction to Robotics	22AML74D	Data Security & Privacy
Open Elective 2 (Offered to other branch students)			
22AML75A	Business Intelligence	22AML75B	Soft Computing

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VIII SEMESTER

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					L	T	P	CIE	SEE	Total	
1	22AML81X	Program Elective 4 (Online Courses)	PEC	TD – AIML PSB-AIML	3	0	0	50	50	100	3
2	22AML82X	Open Elective (Online courses)	OEC	TD – AIML PSB-AIML	3	0	0	50	50	100	3
3	22AML83	Internship	INT	TD – AIML PSB-AIML	0	0	12	100	100	200	10
Total								200	200	400	16

Program Elective 4*			
AML23801A	Augment Reality and Virtual Reality	AML23801C	Edge AI
AML23801B	Intelligent Robots and Drone Technologies	AML23801D	Reinforcement Learning
Open Elective *			
AML23802A	High Performance Computing	AML23802C	MLOPS
AML23802B	Predictive Analysis and IoT		

Elucidation: At the beginning of IV years of the program i.e., after VI semester, VII semester classwork and VIII semester Research Internship /Industrial Internship / Rural Internship shall be permitted to be operated simultaneously by the University so that students have ample opportunity for an internship. In other words, a good percentage of the class shall attend VII semester classwork and a similar percentage of others shall attend to Research Internship or Industrial Internship or Rural Internship. Research/Industrial /Rural Internship shall be carried out at an Industry, NGO, MSME, Innovation center, Incubation center, Start-up, center of Excellence (CoE), Study Centre established in the parent institute and /or at reputed research organizations/institutes. The mandatory Research internship /Industry internship / Rural Internship is for 14 to 20 weeks. The internship shall be considered as a head of passing and shall be considered for the award of a degree. Those, who do not take up/complete the internship shall be declared to fail and shall have to complete it during the subsequent University examination after satisfying the internship requirements.

Research internship: A research internship is intended to offer the flavor of current research going on in the research field. It helps students get familiarized with the field and imparts the skill required for carrying out research.

Industry internship: Is an extended period of work experience undertaken by students to supplement their degree for professional development. It also helps them learn to overcome unexpected obstacles and successfully navigate organizations, perspectives, and cultures. Dealing with contingencies helps students recognize, appreciate, and adapt to organizational realities by tempering their knowledge with practical constraints.

Rural Internship: Rural development internship is an initiative of Unnat Bharat Abhiyan Cell, RGIT in association with AICTE to involve students of all departments studying in different academic years for exploring various opportunities in techno-social fields, to connect and work with Rural India for their upliftment. The faculty coordinator or mentor has to monitor the student's internship progress and interact with them to guide for the successful completion of the internship. The students are permitted to carry out the internship anywhere in India or abroad. University shall not bear any expenses incurred in respect of the internship. With the consent of the internal guide and Principal of the Institution, students shall be allowed to carry out the internship at their hometown (within or outside the state or abroad), provided favorable facilities are available for the internship and the student remains regularly in contact with the internal guide. University shall not bear any cost involved in carrying out the internship by students. However, students can receive any financial assistance extended by the organization.

Professional Elective /Open Elective Course: These are ONLINE courses suggested by the respective Board of Studies. Details of these courses shall be made available for students on the VTU web portal.

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					L	T	P	CIE	SEE	Total	
1	MAT23301A	Discrete Mathematics and Graph Theory	BS	TD - MAT	2	2	0	50	50	100	3
2	CSE23302	Data Structures	PC	TD – AIML /PSB - CSE	3	0	0	50	50	100	3
3	AML23303	Python Programming (Integrated)	IPC	TD/PSB - AIML	3	0	2	50	50	100	4
4	AML23304	Computer Organization and Operating System	PC		2	2	0	50	50	100	3
5	AML23305	Machine Learning Foundation	ETC		2	2	0	50	50	100	3
6	SCK23306	Social Connect and Responsibility	Any Department		0	0	2	100	---	100	1
7	AML23307X	Ability Enhancement Course-III	AEC		2	0	0	50	50	100	2
8	NSK23308	National Service Scheme (NSS)	MC	NSS coordinator	0	0	2	100	---	100	0
	PEK23308	Physical Education (PE) (Sports and Athletics)		Physical Education Director							
	YOK23308	Yoga		Yoga Teacher							
9	CSEL23309	Data Structures Laboratory	PCL	TD – AIML /PSB - CSE	0	0	2	50	50	100	1
Total								550	350	900	20

Ability Enhancement Course-III *

AML23307A	Web Application Frameworks	AML23307C	Project Management with Git
AML23307B	Ethics and Public Policy for AI	AML23307D	PHP Programming

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IV SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	MAT23401A	Probability and Linear Algebra	BS	TD - MAT	2	2	0	50	50	100	3
2	CSE23402	Design and Analysis of Algorithms	PC	TD – AIML /PSB - CSE	3	0	0	50	50	100	3
3	AML23403	Database Management Systems (Integrated)	IPC	TD - AIML	3	0	2	50	50	100	4
4	AML23404	Machine Learning Techniques	PC		2	2	0	50	50	100	3
5	AML23405X	Engineering Science Course	ETC		2	2	0	50	50	100	3
6	UHK23406	Universal human values	UHV	HSS	1	0	0	50	50	100	1
7	AML23407X	Ability Enhancement Course-IV	AEC	TD - AIML	1	0	2	50	50	100	2
8	NSK23408	National Service Scheme (NSS)	MC	NSS coordinator	0	0	2	100	---	100	0
	PEK23408	Physical Education (PE) (Sports and Athletics)		Physical Education Director							
	YOK23408	Yoga		Yoga Teacher							
9	CSEL23409	Algorithms Laboratory	PCL	TD – AIML /PSB - CSE	0	0	2	50	50	100	1
Total								500	400	900	20

Ability Enhancement Course/Skill Enhancement Course-IV*

AML23407A	AI Tools, Frameworks & its Application I	AML23407C	MangoDB
AML23407B	Scala	AML23407D	MERN

Engineering Science Course (ESC/ETC/PLC)*

AML23405A	Object Oriented Programming using Java	AML23405C	Optimization Technique
AML23405B	Discrete Mathematical Structure	AML23405D	Algorithmic Game Theory

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V SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	AML23501	Engineering Economics & Management	HSMS	TD - AIML	3	0	0	50	50	100	3
2	AML23502	Machine Learning Practices (Integrated)	IPC		3	0	2	50	50	100	4
3	AML23503	Big data Analytics	PC		4	0	0	50	50	100	4
4	AMLL23504	Big data Analytics LAB	PCL		0	0	2	50	50	100	1
5	AML23505X	Program Elective 1	PEC		3	0	0	50	50	100	3
6	AML23506	Mini Project	PROJ		0	0	4	100	---	100	2
7	RMIK23507	Research Methodology and IPR	AEC	HSS	2	2	0	50	50	100	3
8	CIVK23508	Environmental Studies	MC	CV	2	0	0	50	50	100	2
9	NSK23509	National Service Scheme (NSS)	MC	NSS coordinator	0	0	2	100	---	100	0
	PEK23509	Physical Education (PE) (Sports and Athletics)		Physical Education Director							
	YOK23509	Yoga		Yoga Teacher							
Total								550	350	900	22

Program Elective 1*			
AML23505A	DevOPs Essentials	AML23505C	Introduction to Intelligent Networks
AML23505B	Microcontroller and Embedded System	AML23505D	Computer Networks and Security

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VI SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	AML23601	Natural Language Processing	IPC	TD - AIML	3	0	2	50	50	100	4
2	AML23602	Deep Learning Principles & Practices	PC		4	0	0	50	50	100	4
3	AML23603X	Program Elective 2	PEC		3	0	0	50	50	100	3
4	AML23604X	Open Elective 1	OEC		3	0	0	50	50	100	3
5	AML23605	Project Phase 1	PROJ		0	0	2	100	--	100	2
6	AMLL23606	Deep Learning LAB	PCL		0	0	2	50	50	100	1
7	AML23607X	Ability Enhancement Course	AEC		0	0	2	50	50	100	1
8	NSK23608	National Service Scheme (NSS)	MC	NSS coordinator	0	0	2	100	---	100	0
	PEK23608	Physical Education (PE) (Sports and Athletics)		Physical Education Director							
	YOK23608	Yoga		Yoga Teacher							
9	IKSK23609	Indian Knowledge System	IKS	HSS(PSB)	1	0	0	100	0	100	0
Total								600	300	900	18

Program Elective 2*			
AML23603A	Parallel and Distributed computing	AML23603C	Artificial Intelligence In Block Chain
AML23603B	Intelligent Embedded System	AML23603D	Time Series Analysis
Open Elective 1 (Offered to other branch students) *			
AML23604A	Next-Gen Database Technology using MongoDB		
Ability Enhancement Course/Skill Enhancement Course*			
AML23607A	AI Tools, Frameworks & itsApplication II	AML23607C	Explainable AI
AML23607B	Generative AI		

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					L	T	P	CIE	SEE	Total	
1	AML23701	Image Analytics with Computer Vision	IPC	TD - AIML	3	0	2	50	50	100	4
2	AML23702	Advance Natural Language Processing	IPC		3	0	2	50	50	100	4
3	AML23703	Quantum Computing	PC		3	2	0	50	50	100	4
4	AML23704X	Program Elective 3	PEC		3	0	0	50	50	100	3
5	AML23705X	Open Elective 2	OEC		3	0	0	50	50	100	3
6	AMLP23706	Major Project Phase-II	Any Department		0	0	12	100	100	100	6
					Total			350	350	700	24

Program Elective 3*			
AML23704A	Datamining and Data warehousing	AML23704C	Human Computer Interaction
AML23704B	Introduction to Robotics	AML23704D	Data Security & Privacy
Open Elective 2 (Offered to other branch students) *			
AML23705A	Business Intelligence	AML23705B	Soft Computing

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1	AML23801X	Program Elective 4 (Online Courses)	PEC	TD - AIML	3	0	0	50	50	100	3
2	AML23802X	Open Elective (Online courses)	OEC		3	0	0	50	50	100	3
3	AML23803	Internship (14-20 Weeks)	INT		0	0	12	100	100	200	10
					Total			200	200	400	16

Program Elective 4*			
AML23801A	Augment Reality and Virtual Reality	AML23801C	Edge AI
AML23801B	Intelligent Robots and Drone Technologies	AML23801D	Reinforcement Learning
Open Elective *			
AML23802A	High Performance Computing	AML23802C	MLOPS
AML23802B	Predictive Analysis and IoT		

Elucidation: At the beginning of IV years of the program i.e., after VI semester, VII semester classwork and VIII semester Research Internship /Industrial Internship / Rural Internship shall be permitted to be operated simultaneously by the University so that students have ample opportunity for an internship. In other words, a good percentage of the class shall attend VII semester classwork and a similar percentage of others shall attend to Research Internship or Industrial Internship or Rural Internship. Research/Industrial /Rural Internship shall be carried out at an Industry, NGO, MSME, Innovation center, Incubation center, Start-up, center of Excellence (CoE), Study Centre established in the parent institute and /or at reputed research organizations/institutes. The mandatory Research internship /Industry internship / Rural Internship is for 14 to 20 weeks. The internship shall be considered as a head of passing and shall be considered for the award of a degree. Those, who do not take up/complete the internship shall be declared to fail and shall have to complete it during the subsequent University examination after satisfying the internship requirements.

Research internship: A research internship is intended to offer the flavor of current research going on in the research field. It helps students get familiarized with the field and imparts the skill required for carrying out research.

Industry internship: Is an extended period of work experience undertaken by students to supplement their degree for professional development. It also helps them learn to overcome unexpected obstacles and successfully navigate organizations, perspectives, and cultures. Dealing with contingencies helps students recognize, appreciate, and adapt to organizational realities by tempering their knowledge with practical constraints.

Rural Internship: Rural development internship is an initiative of Unnat Bharat Abhiyan Cell, RGIT in association with AICTE to involve students of all departments studying in different academic years for exploring various opportunities in techno-social fields, to connect and work with Rural India for their upliftment. The faculty coordinator or mentor has to monitor the student's internship progress and interact with them to guide for the successful completion of the internship. The students are permitted to carry out the internship anywhere in India or abroad. University shall not bear any expenses incurred in respect of the internship. With the consent of the internal guide and Principal of the Institution, students shall be allowed to carry out the internship at their hometown (within or outside the state or abroad), provided favorable facilities are available for the internship and the student remains regularly in contact with the internal guide. University shall not bear any cost involved in carrying out the internship by students. However, students can receive any financial assistance extended by the organization.

Professional Elective /Open Elective Course: These are ONLINE courses suggested by the respective Board of Studies. Details of these courses shall be made available for students on the VTU web portal.

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III SEMESTER

Sl. No	Course	Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical / Discussion	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
1	PCC/BSC	BMATCS24301	Discrete Mathematics	TD: HS PSB: Maths	3	0	0		03	50	50	100	3
2	IPCC	BAML24302	Operating System	TD: AIML PSB: AIML	3	0	2		03	50	50	100	4
3	IPCC	BAML24303	Digital Design & Computer Organization	TD: AIML PSB: AIML	3	0	2		03	50	50	100	4
4	PCC	BAML24304	Data Structures	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
5	PCCL	BAMLL24305	Data Structure Lab	TD: AIML PSB: AIML	0	0	2		03	50	50	100	1
6	ETC/PLC	BAML24306X	ETC/PLC	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
7	UHV	BSCK24307	Social Connect and Responsibility	Any Department	0	0	2		01	100	---	100	1
8	AEC/ SEC	BAML24358X	Ability Enhancement Course / Skill Enhancement Course - III	TD: AIML PSB: AIML	If the course is a Theory				01	50	50	100	1
					1	0	0						
					If a course is a laboratory				02				
					0	0	2						
9	MC	BNSK24359	National Service Scheme (NSS)	NSS coordinator	0	0	2			100	---	100	0
		BPEK24359	Physical Education (PE) (Sports and Athletics)	Physical Education Director									
		BYOK24359	Yoga	Yoga Teacher									
		BLAK24359	Liberal Arts	Prominent NGO									
Total									550	350	900	20	

PCC: Professional Core Course, **PCCL:** Professional Core Course laboratory, **UHV:** Universal Human Value Course, **MC:** Mandatory Course (Non-credit), **AEC:** Ability Enhancement Course, **SEC:** Skill Enhancement Course, **L:** Lecture, **T:** Tutorial, **P:** Practical **S= SDA:** Skill Development Activity, **CIE:** Continuous Internal Evaluation,

SEE: Semester End Evaluation. **K :** This letter in the course code indicates common to all the stream of engineering. **ESC:** Engineering Science Course, **ETC:** Emerging Technology Course, **PLC:** Programming Language Course

Emerging Technology Course/Programming Language Course (ETC/PLC)

BAML24306A	Software Engineering	BAML24306C	Programming with C++
BAML24306B	Introduction to Internet of Things	BAML24306D	Web Application Frameworks
Ability Enhancement Course/Skill Enhancement Course – III			
BAML24358A	UNIX Shell Programming	BAML24358C	Project Management with Git
BAML24358B	Ethics & Public Policy of AI	BAML24358D	Data Analytics with R

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IV SEMESTER

Sl. No	Course	Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
1	PCC/BSC	BMATCS24401	Statistics, Probability and Graph Theory	TD: HS PSB: Maths	3	0	0		03	50	50	100	3
2	IPCC	BAML24402	Design & Analysis of Algorithms	TD: AIML PSB: AIML	3	0	2		03	50	50	100	4
3	PCC	BAML24403	Machine Learning Foundations &Techniques	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
4	PCC	BAML24404	Data Base Management System	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
5	PCCL	BAMLL24405	Data Base Management System Lab	TD: AIML PSB: AIML	0	0	2		03	50	50	100	1
6	ETC/PLC	BAML24406X	ETC/PLC	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
7	AEC/ SEC	BAML24457X	Ability Enhancement Course/Skill Enhancement Course- IV	TD and PSB: Concerned department	If the course is Theory				01	50	50	100	1
					1	0	0						
					If the course is a lab				02				
					0	0	2						
8	BSC	BBOK24407	Biology For Engineers	TD / PSB: BT, CHE,	1	0	0		01	50	50	100	1
9	UHV	BUHK24408	Universal human values	Any Department	1	0	0		01	50	50	100	1
10	MC	BNSK24459	National Service Scheme (NSS)	NSS coordinator	0	0	2			100	---	100	0
		BPEK24459	Physical Education (PE) (Sports and Athletics)	Physical Education Director									
		BYOK24459	Yoga	Yoga Teacher									
		BLAK24459	Liberal Arts	Prominent NGO									
Total									550	450	1000	20	

PCC: Professional Core Course, **PCCL:** Professional Core Course laboratory, **UHV:** Universal Human Value Course, **MC:** Mandatory Course (Non-credit), **AEC:** Ability Enhancement Course, **SDC:** Skill Development Course, **L:** Lecture, **T:** Tutorial, **P:** Practical **S= SDA:** Skill Development Activity, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Evaluation. **K :** This letter in the course code indicates common to all the stream of engineering.

Ability Enhancement Course / Skill Enhancement Course – IV

BAML24457A	AI Tools, frameworks & its Application -I	BAML24457C	PHP Programming
BAML24457B	Programming with Scala	BAML24457D	Full Stack Development using MERN
Emerging Technology Course/Programming Language Course (ETC/PLC)			
BAML24406A	Optimization Technique	BAML24406C	Object Oriented Programming with JAVA
BAML24406B	Foundation of Data Science	BAML24406D	Algorithmic Game theory

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V SEMESTER

Sl. No	Course	Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	HSMC	BAML24501	Engineering Economics and Management (This course must be pertaining to economics and management of the concerned degree program. The course syllabus should have both economics and management topics and the course title should bear the word Management.)	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
2	IPCC	BAML24502	Machine Learning Practices	TD: AIML PSB: AIML	3	0	2		03	50	50	100	4
3	PCC	BAML24503	Big data Analytics	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
4	PCCL	BAMLL24504	Big data Analytics LAB	TD: AIML PSB: AIML	0	0	2		03	50	50	100	1
5	PEC	BAML24505x	Professional Elective Course-I	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
6	AEC/ SEC	BAML24556x	Ability Enhancement Course/Skill Enhancement Course- V	TD: AIML PSB: AIML	If the course is Theory				01	50	50	100	1
					1	0	0						
					If the course is Lab				02				
					0	0	2						
7	PROJ	BAMLP24507	Mini Project	TD: AIML PSB: AIML	0	0	4		03	100	-	100	2
8	AEC	BRMK24557	Research Methodology and IPR	TD: AIML PSB: AIML	2	2	0		03	50	50	100	3
9	MC	BESK24508	Environmental Studies		1	0	0		01	100	-	100	0
10	MC	BNSK24559	National Service Scheme (NSS)	NSS coordinator	0	0	2			100	-	100	0
		BPEK24559	Physical Education (PE) (Sports and Athletics)	Physical Education Director									
		BYOK24559	Yoga	Yoga Teacher									
		BLAK24559	Liberal Arts	Prominent NGO									
Total									650	350	1000	20	

Professional Elective Course-I			
BAML24505A	Cloud Computing	BAML24505C	Time series Analysis
BAML24505B	Computer Networks & Security	BAML24505D	Sensors & Systems
Ability Enhancement Course/Skill Enhancement Course- V			
BAML24556A	UI/UX	BAML24556C	Mobile Application Development
BAML24556B	MongoDB	BAML24556D	Data Visualization using Tableau



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VI SEMESTER

Sl. No	Course	Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	IPCC	BAML24601	Natural Language Processing	TD: AIML PSB: AIML	3	0	2		03	50	50	100	4
2	PCC	BAML24602	Deep Learning Principles & Practices	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
3	PCC	BAML24603	Microcontroller	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
4	PEC	BAML24604x	Professional Elective Course-II	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
5	OEC	BAML24605x	Open Elective Course-I	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
6	PROJ	BAMLP24606	Project Phase-I	TD: AIML PSB: AIML	0	0	4		03	100	--	100	2
7	PCCL	BAMLL24607	Deep Learning Lab	TD: AIML PSB: AIML	0	0	2		03	50	50	100	1
8	AEC/SDC	BAML24657x	Ability Enhancement Course/Skill Development Course-VI (Online)	TD: AIML PSB: AIML	If the course is offered as a Theory				01	50	50	100	1
					1	0	0						
					If course is offered as a practical				02				
					0	0	2						
9	IKS	BIKS24608	Indian Knowledge System		1	0	0		01	100	---	100	0
10	MC	BNSK24659	National Service Scheme (NSS)	NSS coordinator	0	0	2			100	---	100	0
		BPEK24659	Physical Education (PE) (Sports and Athletics)	Physical Education Director									
		BYOK24659	Yoga	Yoga Teacher									
		BLAK24659	Liberal Arts	Prominent NGO									
Total										650	350	1000	20

Professional Elective Course-II			
BAML24604A	Parallel & Distributed Computing	BAML24604C	Large Language Model
BAML24604B	Cryptography	BAML24604D	Augment Reality and Virtual Reality
Open Elective Course-I			
BAML24605A	Next-Gen Database Technology using MongoDB	BAML24605C	Introduction to Machine Learning
BAML24605B	Foundation of Data Science	BAML24605D	JavaScript Programming
Ability Enhancement Course / Skill Development Course-VI			
BAML24657A	AI Tools, frameworks & its Application -II	BAML24657C	Business Intelligence using PowerBI
BAML24657B	Explainable AI	BAML24657D	Generative AI



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VII SEMESTER (Swappable VII and VIII SEMESTER)

Sl. No	Course	Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
1	IPCC	BAML24701	Image Analytics with Computer Vision	TD: AIML PSB: AIML	3	0	2		03	50	50	100	4
2	IPCC	BAML24702	Advance Natural Language Processing	TD: AIML PSB: AIML	3	0	2		03	50	50	100	4
3	PCC	BAML24703	Quantum Computing	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
4	PEC	BAML24704x	Professional Elective Course / (Online)-III	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
5	OEC	BAML24705x	Open Elective Course /(online)-II	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
6	PROJ	BAMLP24706	Major Project Phase-II	TD: AIML PSB: AIML	0	0	14		03	100	100	200	7
										350	350	700	24

Professional Elective Course-III

BAML24704A	Data Mining & Data warehousing	BAML24704C	Reinforcement Learning
BAML24704B	Data Security & Privacy	BAML24704D	Robotics

Open Elective Course-II

BAML24705A	Python Libraries for AI&ML	BAML24705C	Introduction to Sensor and IoT
BAML24705B	Web designing Tools & Frameworks	BAML24705D	Information Security

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Note: VII and VIII semesters of IV years of the program

(1) Institutions can swap the VII and VIII Semester Schemes of Teaching and Examinations to accommodate research internships/ industry internships after the VI semester.

(2) Credits earned for the courses of VII and VIII Semester Scheme of Teaching and Examinations shall be counted against the corresponding semesters whether the VII or VIII semesters is completed during the beginning of the IV year or the later part of IV years of the program.



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VIII SEMESTER (Swappable VII and VIII SEMESTER)

Sl. No	Course	Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	PEC	BAML24801x	Professional Elective (Online Courses)-IV	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
2	PEC	BAML24802x	Professional Elective (Online Courses)-V	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
3	INT	BAML24803	Internship (Industry/Research) (14 - 20 weeks)	TD: AIML PSB: AIML	0	0	12		03	100	100	200	10
										200	200	400	16

Professional Elective Course (Online courses)-IV

BAML24801A	High Performance Computing	BAML24801C	Edge AI
BAML24801B	Block Chain	BAML24801D	Fault & Predictive Analysis

Professional Elective Course (Online courses)-V

BAML24802A	Business Intelligence	BAML24802C	Introduction to Robotics.
BAML24802B	Soft Computing	BAML24802D	Human Computer Interaction

L: Lecture, **T:** Tutorial, **P:** Practical **S= SDA:** Skill Development Activity, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Evaluation. **TD-** Teaching Department, **PSB:** Paper Setting department, **OEC:** Open Elective Course, **PEC:** Professional Elective Course. **PROJ:** Project work, **INT:** Industry Internship / Research Internship / Rural Internship

Note: VII and VIII semesters of IV years of the program

Swapping Facility

- Institutions can swap VII and VIII Semester Scheme of Teaching and Examinations to accommodate **research internships/ industry internships/Rural Internship** after the VI semester.
- Credits earned for the courses of VII and VIII Semester Scheme of Teaching and Examinations shall be counted against the corresponding semesters whether VII or VIII semester is completed during the beginning of IV year or later part of IV year of the program.

Elucidation:

At the beginning of IV years of the program i.e., after VI semester, VII semester classwork and VIII semester **Research Internship /Industrial Internship / Rural Internship** shall be permitted to be operated simultaneously by the University so that students have ample opportunity for an internship. In other words, a good percentage of the class shall attend VII semester classwork and a similar percentage of others shall attend to Research Internship or Industrial Internship or Rural Internship.

Research/Industrial /Rural Internship shall be carried out at an Industry, NGO, MSME, Innovation center, Incubation centre, Start-up, centre of Excellence (CoE), Study Centre established in the parent institute and /or at reputed research organizations/institutes.

The mandatory Research internship /Industry internship / Rural Internship is for 14 to 20 weeks. The internship shall be considered as a head of passing and shall be considered for the award of a degree. Those, who do not take up/complete the internship shall be declared to fail and shall have to complete it during the subsequent University examination after satisfying the internship requirements.

Research internship: A research internship is intended to offer the flavor of current research going on in the research field. It helps students get familiarized with the field and imparts the skill required for carrying out research.

Industry internship: Is an extended period of work experience undertaken by students to supplement their degree for professional development. It also helps them learn to overcome unexpected obstacles and successfully navigate organizations, perspectives, and cultures. Dealing with contingencies helps students recognize, appreciate, and adapt to organizational realities by tempering their knowledge with practical constraints.

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The faculty coordinator or mentor has to monitor the student's internship progress and interact with them to guide for the successful completion of the internship.

The students are permitted to carry out the internship anywhere in India or abroad. University shall not bear any expenses incurred in respect of the internship.

With the consent of the internal guide and Principal of the Institution, students shall be allowed to carry out the internship at their hometown (**within or outside the state or abroad**), provided favorable facilities are available for the internship and the student remains regularly in contact with the internal guide. **University shall not bear any cost involved in carrying out the internship by students.** However, students can receive any financial assistance extended by the organization.

Professional Elective /Open Elective Course: These are ONLINE courses suggested by the respective Board of Studies. Details of these courses shall be made available for students on the VTU web portal.



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VI SEMESTER(A)

VI SEMESTER (A)														
Sl. No	Course	Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits	
					Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks		
					L	T	P	S						
1	IPCC	BAML24601	Natural Language Processing	TD: AIML PSB: AIML	3	0	2		03	50	50	100	4	
2	PCC	BAML24602	Deep Learning Principles & Practices	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3	
3	PCC	BAML24603	Microcontroller	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3	
4	PEC	BAML24604x	Professional Elective Course-II	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3	
5	OEC	BAML24605x	Open Elective Course-I	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3	
6	PROJ	BAMLP24606	Project Phase-I	TD: AIML PSB: AIML	0	0	4		03	100	--	100	2	
7	PCCL	BAMLL24607	Deep Learning Lab	TD: AIML PSB: AIML	0	0	2		03	50	50	100	1	
8	AEC/SDC	BAML24657x	Ability Enhancement Course/Skill Development Course-VI	TD: AIML PSB: AIML	If the course is offered as a Theory				01	50	50	100	1	
					1	0	0							
					If course is offered as a practical				02					
					0	0	2							
9	IKS	BNSK24608	Indian Knowledge System	Any Department	1	0	0		01	100	--	100	0	
10	MC	BPEK24659	National Service Scheme (NSS)	NSS coordinator	0	0	2	--	---	100	---	100	0	
		BYOK24659	Physical Education (PE) (Sports and Athletics)	Physical Education Director										
		BLAK24659	Yoga	Yoga Teacher										
		BIKS24659	Liberal Arts	Prominent NGO										
Total									650	350	1000	20		

Professional Elective Course-II			
BAML24604A	Parallel & Distributed Computing	BAML24604C	Large Language Model
BAML24604B	Cryptography	BAML24604D	Augment Reality and VirtualReality
Open Elective Course-I			
BAML24605A	Next-Gen Database Technology using MongoDB	BAML24605C	Introduction to Machine Learning
BAML24605B	Foundation of Data Science	BAML24605D	JavaScript Programming
Ability Enhancement Course / Skill Development Course-VI			
BAML24657A	AI Tools, frameworks & its Application -II	BAML24657C	Business Intelligence using PowerBI
BAML24657B	Explainable AI	BAML24657D	Generative AI



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VII and VIII semesters for the candidate those who seek an internship with project work (A)

Sl. No	Course	Course Code	Course Title	Teaching Department (TD) and Question	Teaching Hours /Week				Examination				Credits
					Theory Lect	Tutorial	Practical/	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	IPCC	BAML24701	Image Analytics with Computer Vision /To be completed in 5 th /6 th semester	TD: AIML PSB: AIML	3	0	2		03	50	50	100	4
2	IPCC	BAML24702	Advance Natural Language Processing /To be completed in 5 th /6 th semester	TD: AIML PSB: AIML	3	0	2		03	50	50	100	4
3	PCC	BAML24703	Quantum Computing / To be completed in the 6 th semester	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
4	PEC	BAML24704x	Professional Elective Course/Online III	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
5	OEC	BAML24705x	Open Elective Courses/Online II	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
1	PEC	BAML24801x	Professional Elective (MOOC Courses) IV	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
2	PEC	BAML24802x	Professional Elective (MOOC Courses) V	TD: AIML PSB: AIML	3	0	0		03	50	50	100	3
3	INT	BAML24803	Internship (Industry/Research) (02 semesters)	TD: AIML PSB: AIML	0	0	12		03	100	100	200	10
4	PROJ	BAMLP24804	Major Project II - outcome of training	TD: AIML PSB: AIML	0	0	14		03	100	100	200	7
										550	550	1100	40

Professional Elective Course-III			
BAML24704A	Data Mining & Data warehousing	BAML24704C	Reinforcement Learning
BAML24704B	Data Security & Privacy	BAML24704D	Robotics
Open Elective Course-II			
BAML24705A	Python Libraries for AI&ML	BAML24705C	Introduction to Sensor and IoT
BAML24705B	Web designing Tools & Frameworks	BAML24705D	Information Security

Professional Elective Course (Online courses)-IV			
BAML24801A	High Performance Computing	BAML24801C	Edge AI
BAML24801B	Block Chain	BAML24801D	Fault & Predictive Analysis
Professional Elective Course (Online courses)-V			
BAML24802A	Business Intelligence	BAML24802C	Introduction to Robotics.
BAML24802B	Soft Computing	BAML24802D	Human Computer Interaction