DAYANANDA SAGAR ACADEMY OF TECHNOLOGY & MANAGEMENT

CURRICULUM

Scheme and Syllabus VII to VIII Semester

Outcome Based Education

(Academic Year 2025-2026)

Department of Artificial Intelligence and Machine Learning

7th & 8th Semester B.E

ABOUT THE INSTITUTE

Dayananda Sagar Academy of Technology and Management- DSATM was established in 2011 with 5 UG Programmes and 1 PG Program, the programmes are approved by All India Council for Technical Education (AICTE) New Delhi, Affiliated to Visvesvaraya Technological University (VTU), Belagavi and DSATM is an autonomous institute from 2023-2024.

The Dayananda Sagar Institutions is one of pioneer institutions in India and abroad with six decades of excellence in Academic and Research. The newer campuses were necessary to accommodate the growing need of the technology and innovation.

DSATM nurtures the students in academic, research, sports, cultural and extracurricular activities.

- Creating an academic environment to nurture and develop competent entrepreneurs, leaders and professionals who are socially sensitive and environmentally conscious.
- Integration of Outcome Based Education and cognitive teaching and learning strategies to enhance learning effectiveness.
- Developing necessary infrastructure to cater to the changing needs of Business and Society.
- Optimum utilization of the infrastructure and resources to achieve excellence in all areas of relevance.
- Adopting learning beyond curriculum through outbound activities and creative assignments.
- Imparting contemporary and emerging techno-managerial skills to keep pace with the changing global trends.
- Facilitating greater Industry-Institute Interaction for skill development and employability enhancement.
- Establishing systems and processes to facilitate research, innovation and entrepreneurship for holistic development of students.
- Implementation of Quality Assurance System in all Institutional processes.

VISION OF THE INSTITUTE

To strive at creating the institution a centre of highest caliber of learning, so as to create an overall intellectual atmosphere with each deriving strength from the other to be the best of engineers, scientists with management & design skills.

MISSION OF THE INSTITUTE

- To serve its region, state, the nation and globally by preparing students to make meaningful contributions in an increasing complex global society challenges.
- To encourage, reflection on and evaluation of emerging needs and priorities with state-of-the-art infrastructure at institution.
- To support research and services establishing enhancements in technical, economic, human and cultural development.
- To establish interdisciplinary centre of excellence, supporting/ promoting student's implementation.
- To increase the number of Doctorate holders to promote research culture on campus.
- To establish IIPC, IPR, EDC, innovation cells with functional MOU's supporting student's quality growth.

QUALITY POLICY

Dayananda Sagar Academy of Technology and Management aims at achieving academic excellence through continuous improvement in all spheres of Technical and Management education. In pursuit of excellence cutting – edge and contemporary skills are imparted to the utmost satisfaction of the students and the concerned stakeholders.

ABOUT THE DEPARTMENT

VISION OF THE DEPARTMENT

To develop high quality engineers with technical knowledge, skills and ethics in the area of Artificial Intelligence and Machine Learning to meet industrial and societal needs.

MISSION OF THE DEPARTMENT

M1: To provide high quality technical education with up-to-date infrastructure and trained human resources to deliver the curriculum effectively in order to impart technical knowledge and skills.

M2 : To collaborate with research institutions to elevate innovative research and development in AI & ML to serve as per society needs.

M3: To train the students with entrepreneurship qualities, multidisciplinary knowledge and latest skill sets as required for industry and research activities.

M4: To Produce creative and technically strong engineers and to research pioneering solutions to global challenges.

M5: To inculcate knowledge in lifelong learning.

PROGRAM EDUCATION OBJECTIVES (PEO'S):

PEO1: Graduates will have the ability to adapt, contribute and innovate new technologies and systems in the key domains of Artificial Intelligence and Machine Learning.

PEO2: Graduates will be able to successfully pursue higher education in reputed institutions with AI Specialization.

PEO3: Graduates will have the ability to explore research areas and produce outstanding contributions in various areas of Artificial Intelligence and Machine Learning.

PEO4: Graduates will be ethically and socially responsible solution providers and entrepreneurs in the field of Computer Science and Engineering with AI/ML Specialization.

PEO5: Engaged in successful professional practices in their chosen discipline

PROGRAM OUTCOMES (PO's)

Engineering Graduates will be able to:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSO's)

PSO 1: Mathematical Informatics Section: To clarify the process of intelligent activities based on rational reasoning by human beings and to create new methods of problem-solving by implementation with computers.

PSO 2: Architecture Section: To establish the techniques for designing hardware and software systems necessary for the development of the next-generation of intelligent information processing systems.

PSO 3: Application Section: To apply the developed techniques to address challenging problems in various real-life applications from biomedical signal and image analysis, systems biology, climate to social and communication networks .

PROPOSEDUGCREDITSTRUCTUREINALIGNMENTWITH VTU

Sl. No	Semester	No. of Credits
1	1st Semester	20
2	2nd Semester	20
3	3rd Semester	21
4	4th Semester	21
5	5th Semester	22
6	6th Semester	22
7	7th Semester	20
8	8th Semester	14
	Total	**160**

PROPOSED UG SCHEME 7th SEM

Sl. No	Course Category	BOS	TD	Teaching Hours/Week					Credits
				Lecture	Tutorial	Practical	Project	Total (Hrs/week)	
				L	T	P	S		
1	IPCC	AIML	AIML	3	-	2	-	5	4
2	PCC	AIML	AIML	3	-	-	-	3	3
3	PEC-3	AIML	AIML	3	-	-	-	3	3
4	OEC-2	AIML	AIML	3	-	-	-	3	3
5	PWP-2	AIML	AIML	-	-	-	14	14	7
6	NCMC	AIML	AIML	1	-	-	-	1	0
				13	**-**	**2**	**14**	**29**	**20**
	AICTE Activity points mandatory								
								Total	**20**

PROPOSED UG SCHEME 8th SEM

Sl. No	Course Category	BOS	TD	Teaching Hours/Week					Credits
				Lecture	Tutorial	Practical	Project	Total (Hrs/week)	
				L	T	P	S		
1	PROJ-3	AIML	AIML	-	-	-	8	8	4
2	INT	AIML	AIML	-	-	-	20	20	10
3				-	-	-	**28**	**28**	**14**
	AICTE Activity points mandatory								
								Total	**14**

Percentage of Mapping– Theory & Practical - Scheme & Syllabus- 7th Semester& 8th Semester

7th Semester

Sl. No	Course Category	Component			
		Theory	Practical	Outreach	YOGA/SPORTS
1	IPCC	60%	40%	--	--
2	PCC	100%	-	--	--
3	PEC-3	100%	--	--	--
4	OEC-2	100%	--	--	--
5	PROJ-2	--	100%	--	--
6	NCMC	--	-	17%	--
	Total Percentage	**60%**	**23%**	**17%**	**--**

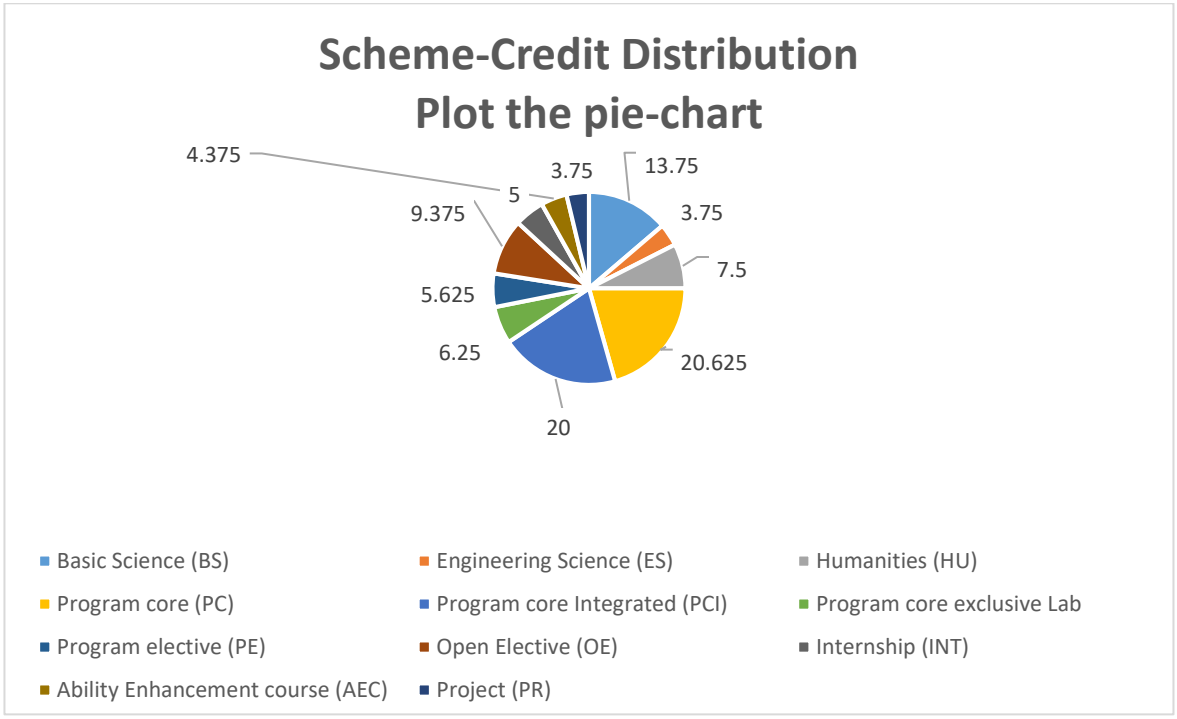
8th Semester

Sl. No	Course Category	Component			
		Theory	**Practical**	**Outreach**	**YOGA/SPORTS**
1	PROJ-3	-	100%	--	--
2	INT	--	100%	--	--
	Total Percentage		**100%**	**--**	**--**

Scheme Distribution

Department of Artificial Intelligence and Machine Learning Engineering

Course Component	Credits	% of Credits
Basic Science (BS)	22	13.75
Engineering Science (ES)	06	3.75
Humanities (HU)	12	7.5
Program core (PC)	33	20.625
Program core Integrated (PCI)	32	20
Program core exclusive Lab	10	6.25
Program elective (PE)	09	5.625
Open Elective (OE)	15	9.375
Internship (INT)	08	5
Ability Enhancement course (AEC)	07	4.375
Project (PR)	06	3.75
Total	**160**	**100**



SEMESTER WISE CREDIT BREAKDOWN FOR B.E. DEGREE CURRICULUM

BATCH 2023-2027

Course Category	Semester								Total Credits
	1st	2nd	3rd	4th	5th	6th	7th	8th	
Basic Sciences (BSC)	8	8	3	3	-	-	-	-	22
Engineering Sciences (ESC)	3	3	-	-	-	-	-	-	06
Humanities, Social Sciences and Management (HSMC)	2	2	1	-	3	3	-	-	11
Ability Enhancement Course (AEC)	1	1	1	1	1	1	1	-	7
Universal Human Values (UHV)	-	-	-	1	-	-	-	-	1
Professional Core Courses (PCC)	3	3	6	6	6	6	3	-	33
Integrated Professional core Course (IPCC)	-	-	8	8	4	4	8	-	32
Professional Elective Course (PEC)	3	3	-	-	3	3	3	-	15
Institutional Open Elective Courses (IOE)	-	-	-	-	3	3	3	-	9
Internship (INT)	-	-	-	-	-	-	-	8	8
Mini Project / Project Work (PW)	-	-	2	2	2	2	2	6	16
Non-credit Mandatory Courses (NCMC)	-	-	-	-	-	-	-	-	-
Total Credits	20	20	21	21	22	22	20	14	160

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Affiliated to VTU
Approved by AICTE
Accredited by NAAC with A+ Grade
6 Programs Accredited by NBA
(CSE, ISE, ECE, EEE, MECH, CIVIL)

Scheme of Teaching and Examinations – 2025
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from 2025-26)

7th SEMESTER: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING (AIML)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration(Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	BAI701	Cloud Computing and AI Deployment	IPCC	AIML	AIML	3	-	2	-	5	4	3	50	50	100
2	BAI702	Data Engineering and MLOps	PCC	AIML	AIML	3	-	-	-	3	3	3	50	50	100
3	BAI703*	Professional Elective Course – 3	PEC-3	AIML	AIML	3	-	-	-	3	3	3	50	50	100
4	BAI704*	Open Elective Course - 2	OEC-2	AIML	AIML	3	-	-	-	3	3	3	50	50	100
5	BAI705	Capstone Project Phase-II	PROJ-2	AIML	AIML	-	-	-	14	14	7	3	100	100	200
6	BIKS706	Indian Knowledge System	NCMC	AIML	AIML	1	-	-	-	1	0	-	100	-	100
** AICTE Activity points mandatory			Total			**13**	**-**	**2**	**14**	**29**	**20**	**15**	**400**	**300**	**700**

7th Semester Professional Elective Course-3

BAI703A	AI in Cybersecurity	**BAI703B**	Edge AI Frameworks

7th Semester OEC course-2

BAI704A	AI in Entrepreneurship and Innovations	**BAI704B**	AI for Sustainability

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Scheme of Teaching and Examinations – 2025
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from 2025-26)

8th SEMESTER: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING (AIML)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration(Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	BAI801	Capstone Project Phase-III	PROJ-3	AIML	AIML	-	-	-	8	8	4	3	50	50	100
2	BINT802	Internship	INT	AIML	AIML	-	-	-	20	20	10	3	100	-	100
** **AICTE Activity points mandatory**					**Total**	-	-	**-**	**28**	**28**	**14**	**6**	**150**	**50**	**200**

IPCC: Integrated Professional Core Course,

PCC: Professional Core Course

PEC: Professional Elective Course

OEC: Open Elective Course

PWP-2: Project Work Phase 2

NCMC: Non-Credit Mandatory Course

L: Lecture, T: Tutorial, P: Practical

S= SDA: Skill Development Activity,

CIE: Continuous Internal Evaluation,

SEE: Semester End Evaluation.

Integrated Professional Core Course (IPCC): Refers to Integrated Professional Core Course Theory Integrated with practicals of the same course. Credit for IPCC can be 04 and its Teaching Learning hours (L:T: P) can be considered as (3:0: 2) or (2:2: 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper.

Non Credit Mandatory Course (NCMC) - National Service Scheme /Physical Education/Yoga: All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE) (Sports and Athletics), and Yoga (YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of degree

Newly introduced subjects in the syllabus

		7TH Semester	8TH Semester
1.	**List of Existing Elective Courses**	-	-
2.	**List of New Existing Elective Courses**	AI in Cyber security AI for Sustainability	**-**
3.	**List of New Industry Aligned Courses**	AI in Entrepreneurship and Innovations Edge AI Frameworks	AI in Security and Privacy

Percentage of Change in the Syllabus

7th Semester						
Sl. No	**Course Code**	**Course Name**	**Topics Added**	**Topics removed**	**Revised in %**	**Justification**
1	BAI701	Cloud Computing and AI Deployment	AutoML, AI deployment	Cloud Security and distributed System.	20	Inline with industry
2	BAI702	Data Engineering and MLOps	-	-	0	-
3	BAI703A	AI in Cybersecurity	AI content are added in all modules	-	50	As per AI trend AI is incorporated in cyber security
	BAI703B	Edge AI Frameworks	Entirely new syllabus	-	100	To equip with practical skills in developing intelligent systems on edge hardware to enhance the industry readiness.
4	BAI704A	AI in Entrepreneurship and Innovations	Entirely new syllabus	-	100	To make students aware about the process of startups
	BAI704A	AI for Sustainability	Entirely new syllabus	-	100	To learn about SDG and sustainability in IT
5	BAI705	Capstone Project Phase-2	-	-	-	-
6	BIKS706	Indian Knowledge System	-	-	-	-
8th Semester						
Sl. No	**Course Code**	**Course Name**	**Topics Added**	**Topics removed**	**Revised in %**	**Justification**
1	BAI801	Capstone Project Phase-3	Entirely new syllabus	-	100	Patent and Publication
2	BINT802	Internship	-	-	-	-

7TH SEMESTER

INTEGRATED PROFESSIONAL CORE COURSE (IPCC)

IPCC Course–Integrated Professional Core Course

Teaching Hours/Week (L: T:P:S)	3:0:2:0
Total Hours of Pedagogy	40 hours Theory + 20 Hours of Practical Classes
Credits:	04
Theory - Each Module	8 Hrs
Practical's	8-10 Programs / Experiments
CIE Marks	50
SEE Marks	50
Total Marks	100
Exam Hours	3
Examination nature (SEE)	Theory

- The theory part of the IPCC shall be evaluated both by CIE and SEE.
- The practical part shall be evaluated by only CIE (no SEE).
- However, questions from the practical part of IPCC shall be included in the SEE question paper.

Integrated Professional Core Course (IPCC) - 4 Credit Course	
	Assessment Details (both CIE and SEE) • The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. • The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). • A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together. **Continuous Internal Evaluation (CIE) for the Theory component of the IPCC (Maximum marks 50)** **Internal Assessment Test (IAT):** • IPCC means practical portion integrated with the theory of the course. • CIE marks for the theory component are 25 marks and that for the practical component is 25 marks. • 25 marks for the theory component are split into 15 marks for two Internal Assessment Tests

(Two Tests, each of 50 Marks with 01-hour 30 minutes' duration, are to be conducted and average of two tests to be reduced to 15 marks) and 10 marks for Two Continuous Comprehensive Assessment(CCA) methods.

- The first Internal test at the end of 40-50% coverage of the syllabus
- The second Internal test after covering 85-90% of the syllabus.
- Scaled-down marks of the sum of two tests and other assessment methods will be CIE marks for the theory component of IPCC (that is for 25 marks).
- The student has to secure 40% of 25 marks to qualify in the CIE of the theory component of IPCC.

The IA test questions are to be framed to map the Course Outcomes (COs), Program Outcomes (POs) and the Revised Blooms Taxonomy (RBT) Levels. Emphasis to be given for Higher order Thinking Skills(HOTS).

Continuous Internal Evaluation (CIE) for the practical component of the IPCC

- On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report, **05 Marks** are for conducting the experiment,**05 Marks for** preparation of the laboratory record, **5 Marks** for conducting Open Ended Experiments Each experiment. Marks of all experiments' write-ups are added to 15 marks.
- The Practical laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for **50 Marks** and scaled down to **5 Marks.**
- The open-ended experiment after completion of all the experiments shall be conducted for 20 marks with a split-up for 5 Marks for writeup, 10 Marks for Execution, and 5 Marks for Viva-Voce.
  Marks for writeup, Execution and Viva-Voce is added and scaled down to 05 marks.
- Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for 25 marks.
- The student has to secure 40% of 25 marks to qualify in the CIE of the practical component of the IPCC.

Semester End Examination (SEE) for IPCC Theory

	SEE will be conducted as per the scheduled timetable, with common question papers for the course (duration 03 hours) • The question paper will have ten questions. Each question is set for 20 marks. • The question paper shall be set for 100 Marks. The medium of the question paper shall be English. **The duration of SEE is 03 hours.** • There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module. The two questions shall be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels. • The students have to answer 5 full questions, selecting one full question from each module. • Marks scored by the student shall be proportionally scaled down to 50 Marks. • The theory portion of the IPCC shall be for both CIE and SEE, whereas the practical portion will have a CIE component only. • Questions mentioned in the SEE paper may include questions from the practical component. **Continuous and Comprehensive Assessment (CCA):** Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be (CCA1+CCA2)/2 and scaled down to **10 Marks**. • CCA1 after 4th week and CCA2 after 9th week. The Assessment will be through rubrics. • CCA as project-based learning, o CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission. o The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report Total score for CCA is **10 Marks** Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks** **Possible Continuous and Comprehensive Assessment (CCA):**

	• Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, • The assessment of these techniques shall be in rubrics. • The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

4 Credits Courses – Integrated Professional Core Course (IPCC)

Assessment Method	Component	Type of Assessments	Syllabus Coverage	Maximum Marks	Average	Reduced Marks	Minimum Passing Marks	Evaluation Details
Total CIE Theory + Practical				**50**	----	----	**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module – 1 to 2.5	50	(50+50) / 2	**15**	6	Average of Two Internal test each of 50 Marks scale down the marks to 15 Marks
		Internal Assessment Test (IAT) - II	Module – 2.5 to 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives / Activity based learning	Considering all the Modules	50	(50+50) / 2	**10**	4	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives/ Activity based learning		50				
	Total CIE Theory					**25**	10	Scale down Marks of IAT and CCA to 25

CIE	**Practical**	Conduction of Experiments	Performance-Continuous Evaluation of each experiment	05	15	Average of all Experiments	15	4	Performance of the Experiment (On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. 20 marks are for conducting the experiment and calculations/observations/output)
			Record	05					
			Observation book	05					
		Practical Test	Write up	15	50	----	05	4	One Internal Practical Test after conduction of all Experiments for 50 Marks
			Execution	25					
			Viva-voce	10					
		Open Ended Experiment	Write up	05	20	----	05	2	One experiment for 20marks. 20 marks reduced to 05 marks
			Execution	10					
			Viva-voce	05					
						Total CIE Practical	**25**	**10**	Scale down Marks of Experiments, Record, Observation, Practical Test and Open-Ended Experiment

SEE		Theory exam	Entire theory syllabus including questions from lab Component in respective Modules	100	----	50	20	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
			CIE + SEE	100	----	----	40	

- The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component.
- The Laboratory Component for the IPCC shall be for CIE only.
- However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.

Note: If few of the 3 Credit Courses are Integrated course type, for such courses the method suggested for 4 Credit IPCC Course shall be followed

Dayananda Sagar Academy of Technology & Management

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Semester	:	**Seventh**				
Course Title	:	**Cloud Computing and AI Deployment**				
Course Code	:	**BAI701**				
Course Type (Theory/Practical/ Integrated)	:	**Integrated**				
Category	:	**IPCC**				
Stream	:	**AIML**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**3:0:2:0**		**SEE**	:	**50**
Total Hours	:	**40T +20 P**		**SEE Duration**	:	**3 Hrs.**
Credits:	:	**4**				

Course Learning Objectives: Students will be taught

Sl.No	Course Objectives
1	To Explain the fundamentals of cloud computing.
2	To Demonstrate the use of AWS services.
3	To apply Docker and Kubernetes in cloud.
4	To analyze AI application deployment process in cloud and Work with Docker and Deploy Applications in Kubernetes.

Teaching-Learning Process

Pedagogy (General Instructions):

These are sample Strategies; which teachers can use to accelerate the attainment of the various course outcomes.

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.

5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2025-26
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2025-26)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	**Introduction to Cloud Computing:** Defining Cloud Computing, Fundamentals of the Cloud, Traditional Data Centers, Cloud Service Models, The Benefits of Cloud, The Different Cloud Providers. Virtual Private Cloud (VPC): What Is a VPC?, Subnets, Internet Gateways, Route Tables and NAT Gateways, Security Groups and NACLs, Create a VPC, Public, and Private Subnet, **Textbook 1 : Chapter 1, Chapter 5**	8
Pedagogy	**Chalk and board, group discussion, ppt, videos**	
2	The AWS Global Infrastructure., What Is Identity and Access Management? A Closer Look at AWS Identity and Access Management (AWS IAM), Creating an IAM User, Group, and Role, IAM Policies and Features, AWS Core Services Overview of Amazon S3, Amazon Elastic Compute Cloud (EC2), Amazon EC2 Components, EC2 Instance Naming Conventions, Instance Types. **Textbook 1 : Chapter 2 – 2.7,Chapter 3 – 3.1-3.4** **Textbook 1 : Chapter 4- 4.1 & Chapter 6 – 6.3-6.6**	8
Pedagogy	**Chalk and board, group discussion, ppt, videos**	
3	A step-by-step approach to developing AI applications, Model evaluation parameters (metrics), Model deployment, Overview of the use case – automated invoice processing (AIP), Designing AIP with AI platform tools on GCP, performing optical character recognition using the Vision API, Storing the invoice with Cloud SQL, Validating the invoice with Cloud Functions, Scheduling the invoice for the payment queue (pub/sub), Notifying the vendor and AP team about the payment completion. **Textbook 2 : Chapter 10**	8

Pedagogy	**Chalk and board, group discussion, ppt, videos**	
4	**The Docker Engine**: Docker Engine-The Deep Dive, Getting rid of LXC, Getting rid of the monolithic Docker daemon, The influence of the Open Container Initiative (OCI),containerd, Starting anewcontainer(example),One huge benefit of this model,How it's implemented on Linux, What's the point of the daemon, Securing client and daemon communication. **Images:**Docker images - The deep dive, Images and containers, Images are usually small, Pulling images, Image naming, Image registries, Image naming and tagging, Images with multiple tags, Filtering the output of docker image ls,Images and layers, Sharing image layers, Pulling images by digest,Multi-architecture images, Deleting Images. **Containers**: Docker containers - The deep dive, Containers vs VMs,The VM tax, Running containers, Starting a simple container, Container processes, Container lifecycle. **Textbook 3: Chapter 5, Chapter 6, Chapter 7.**	**8**
Pedagogy	**Chalk and board, group discussion, ppt, videos**	
5	**Kubernetes principles of operation:** Kubernetes from 40K feet, Control plane and worker nodes, Kubernetes DNS, Packaging apps for Kubernetes, The declarative model and desired state, Pods, Deployments, Service objects and stable networking. **Getting Kubernetes:** Kubernetes playgrounds, Hosted Kubernetes, DIY Kubernetes clusters, Getting Kubernetes to follow along with the examples, Play with Kubernetes, Docker Desktop, Google Kubernetes Engine (GKE),Other installation methods, kubectl. **Textbook 4: Chapter 2, Chapter 3.**	**8**
Pedagogy	**Chalk and board, group discussion, ppt, videos**	

List of Experiments or Programs

Sl. No	Experiments/Programs	COs
1	**Perform the following tasks to demonstrate your understanding of Docker installation and container lifecycle management:** • Install Docker on the lab machine and verify the installation using docker version and docker info • Pull the official alpine and nginx images from Docker Hub • Run a container, list running containers with docker ps, and list all containers including stopped ones with docker ps -a • Stop, start, and remove containers using the appropriate commands	**CO4**
2	**Execute the following tasks to demonstrate your understanding of building and running an application using a Dockerfile.** • Write a minimal web application in Python (Flask) or Node.js that returns a response on port 5000 • Write a Dockerfile for the application using FROM, RUN, COPY, EXPOSE, and CMD	**CO4**

	• Build the image with docker build -t myapp:v1 . and verify it appears in docker images • Tag the image with a version label and run it with port mapping using docker run -d -p 5000:5000 myapp:v1 • Confirm the application is reachable from the host browser or via curl	
3	**Demonstrate the following tasks to demonstrate your understanding of Docker debugging and troubleshooting.** • Run the application from Lab 2 and use docker logs to view its output • Use docker logs -f to follow logs in real time while making requests to the application • Use docker exec -it <name> /bin/bash to open a shell inside the running container and inspect the filesystem and running processes • Introduce a deliberate failure: remove a required environment variable or corrupt a config file, rebuild, and run the broken image • Diagnose the failure using docker logs and docker inspect to read the exit code without entering the container	**CO5**
4	**Perform the following tasks to demonstrate your understanding of persistent data storage in Docker using volumes.** • Run an official postgres:15 or mongo:7 (the latest stable version) container with a named volume attached, a password set via -e, and port 5432 published • Connect to the database using a client (psql/mongoosh or a GUI) and create a table with a few rows of data • Stop the container and remove it with docker rm • Recreate the container pointing to the same named volume and verify that the data from the previous session is still present	**CO4**
5	**Demonstrate the following tasks to demonstrate your understanding of Docker networking using custom bridge networks.** • Create a custom bridge network using docker network create • Run two containers (for example, a web server and a database) attached to that network • Verify that the containers can reach each other by name using ping or curl from inside one container • Run a third container on the default bridge network and confirm it cannot reach the containers on the custom network	**CO5**
6	**Perform the following tasks to demonstrate your understanding of creating and managing a multi-container application using Docker Compose.**	**CO4**

	• Write a docker-compose. yml that defines at least two services: a web application and a database • Use depends on to express the startup dependency between them • Bring the stack up with docker compose up -d and confirm both services are running • Use docker compose logs -f <service> to tail the logs of a single service • Use docker compose exec <service> /bin/sh to inspect a running service • Bring the stack down with docker compose down and verify that containers and the network are removed	
7	**Execute the following tasks to demonstrate your understanding of Kubernetes Pod creation and management.** • Set up a local Kubernetes cluster using Minikube or kind and verify it is healthy with kubectl cluster-info and kubectl get nodes • Write a Pod manifest in YAML for a simple nginx container, applying the correct apiVersion, kind, metadata, and spec structure • Apply the manifest using kubectl apply -f and verify the Pod reaches the Running phase with kubectl get pods • Inspect the Pod in detail using kubectl describe pod and read through the Events section • Delete the Pod using kubectl delete pod and observe that it is not recreated (since there is no controller managing it)	**CO4**
8	**Perform the following tasks to demonstrate your understanding of Kubernetes Deployments and scaling.** • Write a Deployment manifest for the application image built in Lab 2, starting with 2 replicas • Apply the manifest and confirm both Pods are running using kubectl get pods and kubectl get deployments • Scale the Deployment to 5 replicas using kubectl scale and watch the rollout with kubectl rollout status • Delete one Pod manually and observe that the Deployment controller recreates it automatically • Reduce replicas back to 2 and confirm the excess Pods are terminated	**CO4**
	Open ended Programs	
1	**Perform the following tasks to demonstrate your understanding of exposing applications in Kubernetes using Services.** • Write a Service manifest of type NodePort that selects the Pods from the Deployment in Lab 8	**CO5**

	• Apply the manifest and inspect the assigned NodePort using kubectl get svc • Access the application from outside the cluster using the node IP and NodePort • Update the Service selector to use a label that does not match any Pod and observe that traffic stops being routed • Correct the selector and confirm access is restored	
2	**Demonstrate the following tasks to demonstrate your understanding of Kubernetes configuration management, rolling updates, and debugging.** • Create a ConfigMap containing application configuration values and mount it into the Deployment from Lab 8 as environment variables • Update the container image tag in the Deployment manifest to a new version and apply it; observe the rolling update using kubectl rollout status • Introduce a bad image tag (one that does not exist) and apply it; observe the Deployment stall and diagnose the failure using kubectl describe pod to find the ImagePullBackOff error • Roll back to the previous working version using kubectl rollout undo and confirm the application is healthy again • Use kubectl exec -it to open a shell inside a running Pod and verify the ConfigMap values are present as environment variables • Use kubectl logs to read application output and kubectl get events to review the full event history of the failure and recovery	**CO5**

Text Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Cloud Computing with AWS: Everything You Need to Know to be an AWS Cloud Practitioner – by Pravin Mishra,Apress, 2023.
2	Hands-On Artificial Intelligence on Google Cloud Platform, by Anand Deshpande ,Manish Kumar ,Vikram Chaudhari & Published by Packt Publishing Ltd,1st edition
3	Docker Deep Dive: Zero to Docker in a Single Book –By Nigel Poulton,Leanpub / O'Reilly Media-2025
4	The Kubernetes Book by Nigel Poulton,Leanpub / O'Reilly Media-2025

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Productionizing AI: How to Deliver AI B2B Solutions with Cloud and Python, by Jalem Raj Rohit,Apress

Course Outcome: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	Level Indicator
CO1	**Understand** the core concepts of cloud computing, including cloud service models, traditional data centers, major cloud providers, containerization, and the architecture of Docker and Kubernetes.	Understand	L1/L2
CO2	**Apply** AWS services by setting up and securing an AWS account, configuring IAM users and roles, working with Docker and Kubernetes, and deploying applications..	Apply	L3
CO3	**Analyze** the architecture of a Virtual Private Cloud (VPC) by examining subnets, route tables, gateways, and security mechanisms used for network configuration.	Analyze	L4
CO4	**Design** cloud-based solutions using AWS and deploy applications in the cloud.	Design	L5
CO5	**Evaluate** different cloud deployment methods for AI applications and work with Docker and Kubernetes.	Create	L5

Weblinks and Video Lectures (e-Resources)	
1	https://docs.aws.amazon.com/index.html
2	https://aws.amazon.com/documentation-overview/ec2/
3	Lab programs Docker install guide - https://docs.docker.com/engine/install/ubuntu/

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO 3
CO1	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
CO2	1	-	-	-	-	-	-	-	-	-	1	-	-	1	-
CO3	-	1	-	-	-	-	-	1	-	-	1	-	-	-	1
CO4	-	-	2	-	1	-	-	1	1	1	1	-	-	1	-
CO5	-	-	-	1	-	1	-	1	1	1	-	-	1	-	-

CIE- Continuous Internal Evaluation (50 Marks)

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module-2-2.5	Module-2.5-3	Module-4	Module-5		
CO1	6	4	--	--	--	--	10	20%
CO2	4	6	--	--	--	--	10	20%
CO3	--	--	5	5	6	--	10	20%
CO4	--	--	--	--	4	4	10	20%
CO5	--	--	--	--	--	6	10	20%
Total	10	10	5	5	10	10	50	100%

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	5
Understand	5
Apply	10
Analyse	10
Evaluate	10
Design	10

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module-2-2.5	Module-2.5-3	Module-4	Module-5		
CO1	10	-	-	-	-	-	10	20%
CO2	-	10	-	-	-	-	10	20%
CO3	-	-	5	5	-	-	10	20%
CO4	-	-	-	-	10	-	10	20%
CO5	-	-	-	-	-	10	10	20%
Total	10	10	5	5	10	10	50	100%

PROFESSIONAL CORE COURSE (PCC)

PCC Course - Professional Core Course

Teaching Hours/Week (L: T:P:S)	3:0:0:0
Total Hours of Pedagogy	40 hours
Credits:	03
Each Module	8 Hrs
CIE Marks	50
SEE Marks	50
Total Marks	100
Exam Hours	3
Examination nature (SEE)	Theory

3 Credit Course – Professional Core Course (PCC)

Assessment Details (both CIE and SEE)

- The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%.
- The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks).
- A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

Internal Assessment Test (IAT):

- For the Internal Assessment Test component of CIE, there are 25 marks and for Assignment component of the CIE, there are 25 marks. Two Tests, each of 50 Marks with 01-hour 30 minutes' duration, are to be conducted and average of two tests to be reduced to 25 marks
  - The first test will be administered after 40-50% of the syllabus has been covered, and
  - The second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.

- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.
- Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

The IA test questions are to be framed to map the Course Outcomes (COs), Program Outcomes (POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Semester-End Examination:

Theory SEE will be conducted as per the scheduled timetable (duration 03 hours).

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored shall be proportionally reduced to 50 marks.

Continuous and Comprehensive Assessment (CCA):

Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **10 Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is **10 Marks**

Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks**

Possible Continuous and Comprehensive Assessment (CCA):

- Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom,
- The assessment of these techniques shall be in rubrics.
- The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Professional Core Course (PCC) – 3 Credit course – Theory

Assessment Method	Component	Type of Assessments	Syllabus Coverage	Maximum Marks	Average	Reduced Marks	Minimum Passing Marks	Evaluation Details
Total CIE Theory + Practical				**50**	----	----	**20**	
	Theory	Internal Assessment Test (IAT) - II	Module – 1 to 2.5	50	(50+50) / 2	**25**	10	Average of Two Internal test each of 50 Marks scale down the marks to 25
		Internal Assessment Test (IAT) - II	Module – 2.5 to 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives / Activity Based learning	Considering all the Modules	50	(50+50) / 2	**25**	10	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives / Activity Based learning		50				
	Total CIE Theory					**50**	20	Total Marks of IAT and CCA is50

SEE		Theory exam	Entire theory syllabus including questions from lab Component in respective Modules	100	----	50	20	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
			CIE + SEE	100	----	----	40	

DSATM

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**Seventh**				
Course Title	:	**Data Engineering & MLOps**				
Course Code	:	**BAI702**				
Course Type (Theory/Practical/Integrated/Project)	:	**Theory**				
Category	:	**PCC**				
Stream	:	**AIML**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**3:0:0:0**		**SEE**	:	**50**
Total Hours	:	**40T**		**SEE Duration**	:	**3 Hrs.**
Credits	:	**3**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	To introduce the concepts and lifecycle of Data Engineering.
2	To explore principles of data architecture and distributed systems.
3	To familiarize students with MLOps pipelines for scalable ML solutions.
4	To understand model deployment, CI/CD, monitoring, and feedback loops.
5	To ensure governance, reproducibility, and responsible AI compliance.

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.

- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

DSATM

Scheme of Teaching and Examinations for BE Programme -2025-26

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2025-26)

COURSE CURRICULUM

Module No.	Topics	Hours
1	**Data Engineering:** Definition, The Data Engineering Lifecycle, Evolution of the Data Engineer, Data Engineering and Data Science, Data Engineering Skills and Activities, Data Maturity and the Data Engineer, The Background and Skills of a Data Engineer, Business Responsibilities, Technical Responsibilities, The Continuum of Data Engineering Roles, Data Engineers Inside an Organization , Internal-Facing Versus External-Facing Data Engineers, Data Engineers and Other Technical Roles, Data Engineers and Business Leadership. **Data Engineering Lifecycle:** The Data Lifecycle Versus the Data Engineering Lifecycle, Generation: Source Systems, Major Undercurrents Across the Data Engineering Lifecycle **Textbook 1:Chapter 1 (1.1–1.5), Chapter 2 (2.1–2.4)**	8
Pedagogy	**Chalk and talk, PPT, Discussion with real-time examples, Demonstration using modern tools**	
2	**Data Architecture:** Enterprise Architecture Defined, Data Architecture Defined, "Good" Data Architecture, Principles of Good Data Architecture, Major Architecture Concepts, Domains and Services , Distributed Systems, Scalability, and Designing for Failure ,Tight Versus Loose Coupling: Tiers, Monoliths, and Microservices , User Access: Single Versus Multitenant , Event-Driven Architecture , Examples and Types of Data Architecture **Choosing Technologies Across the Data Engineering Lifecycle:** Team Size and Capabilities, Speed to Market, Interoperability, Cost Optimization and Business Value, Total Cost of Ownership Total Opportunity Cost of Ownership, FinOps, Today Versus	8

	the Future: Immutable Versus Transitory Technologies: Hybrid Cloud, Multicloud , Decentralized: Blockchain and the Edge ,Monolith Versus Modular , Serverless Versus Servers, Server Versus Serverless evaluation **Textbook 1:Chapter 3 (3.1–3.7), Chapter 4 (4.1–4.6)**	
Pedagogy	**Chalk and talk, PPT, Discussion with real-time examples, Demonstration using simulation**	
3	MLOps Challenges, MLOps to Mitigate Risk, Risk Assessment, Risk Mitigation, MLOps for Responsible AI,MLOps for Scale. Key MLOps Features: Model Development, Establishing Business Objectives, Data Sources and Exploratory Data Analysis, Feature Engineering and Selection, Training and Evaluation, Reproducibility, Responsible AI, Productionalization and Deployment, Model Deployment Types and Contents, Model Deployment Requirements, Monitoring **Developing Models:** Machine Learning Model, Required Components, Different ML Algorithms, Different MLOps Challenges, Data Exploration, Feature Engineering and Selection, Feature Engineering Techniques, How Feature Selection Impacts MLOps Strategy, Experimentation, Evaluating and Comparing Models, Choosing Evaluation Metrics, Cross Checking Model Behavior, Impact of Responsible AI on Modeling, Version Management and Reproducibility . **Textbook 2: Chapter 1 (1.1–1.3), Chapter 2 (2.1–2.4)**	**8**
Pedagogy	**Chalk and talk, PPT, Discussion with real-time examples, Simulation experiments**	
4	**Preparing for Production:** Runtime Environments, Adaptation from Development to Production Environments, Data Access Before Validation and Launch to Production, Final Thoughts on Runtime Environments, Model Risk Evaluation, The Purpose of Model Validation, The Origins of ML Model Risk, Quality Assurance for Machine Learning. **Deploying to Production:** CI/CD Pipelines, Building ML Artifacts, The Testing Pipeline, Deployment Strategies, Categories of Model Deployment, Considerations When Sending Models to Production, Maintenance in Production, Containerization, Scaling Deployments, Requirements and Challenges. **Textbook 2:Chapter 3 (3.1–3.5), Chapter 4 (4.1–4.4)**	**8**
Pedagogy	**Chalk and talk, PPT, Discussion with real-time examples, Demonstration using modern tools**	

5	**Monitoring and Feedback Loop:** Models Be Retrained, Understanding Model Degradation, Ground Truth Evaluation, Input Drift Detection, Drift Detection in Practice, Example Causes of Data Drift, Input Drift Detection Techniques, The Feedback Loop, Logging, Model Evaluation, Online Evaluation **Model Governance:** Governance the Organization Needs, Matching Governance with Risk Level, Current Regulations Driving MLOps Governance, Pharmaceutical Regulation in the US: GxP Financial Model Risk Management Regulation, GDPR and CCPA Data Privacy Regulations, The New Wave of AI-Specific Regulation, The Emergence of Responsible AI, Key Elements of Responsible AI (Element 1 to Element 5), A Template for MLOps Governance (Step 1 to 8). **Textbook 2:Chapter 5 (5.1–5.4), Chapter 6 (6.1–6.3)**	**8**
Pedagogy	**Chalk and talk, PPT, Discussion with real-time examples, Demonstration using modern tools**	
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	Joe Reis, Matt Housley, Fundamentals of Data Engineering, O'Reilly, 2022
2	Mark Treveil & Dataiku Team, Introducing MLOps, O'Reilly, 2020
Reference Books	
1	https://www.ibm.com/think/topics/data-engineering
2	https://martinfowler.com/articles/microservices.html

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	**Understand** Data Engineering and various roles	Understand	L1/L2
CO2	**Apply** MLOps Features and analyze the challenges in developing and Deploying Machine Learning Models	Apply	L2
CO3	**Analyze** various major architecture concepts of Data engineering.	Analyze	L3
CO4	**Design** CI/CD Pipelines for Deploying Machine Learning Models	Design	L4
CO5	**Evaluate** the need for model governance and MLOps governance	Investigate	L5

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
CO2	1	-	-	-	-	-	-	-	-	-	1	-	-	1	-
CO3	-	1	-	-	-	-	-	1	-	-	1	-	-	-	1
CO4	-	-	2	-	1	-	-	1	1	1	1	-	-	1	-
CO5	-	-	-	1	-	1	-	1	1	1	-	-	1	-	-

Weblinks and Video Lectures (e-Resources)	
1	https://martinfowler.com/articles/microservices.html
2	https://www.coursera.org/specializations/mlops

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory			
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks
Remember	10	10	--	--
Understand	20	10	--	--
Apply	10	20	--	--
Analyze	10	10	--	--
Evaluate	--	--	50	--
Create	--	--	--	50

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	10	10	--	15	--	--	35	70%
CO2	--	--	5	--	5		10	20%
CO3	--	--	--	--		5	5	10%
CO4	--	--	--	--	--	--	--	--
CO5	--	--	--	--	--	--	--	--
Total	10	10	5	15	5	5	50	100%

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	5
Understand	5
Apply	10
Analyse	10
Evaluate	10
Create	10

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	5	5	--	--	--	--	10	20
CO2	5	--	3	2	--	--	10	20
CO3	--	5	3	2	--	--	10	20
CO4	--	--	--	--	5	5	10	20
CO5	--	--	--	--	5	5	10	20
Total	10	10	5	5	10	10	50	20

PROFESSIONAL ELECTIVE COURSE (PEC-3)

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	**:**	**Seventh**				
Course Title	**:**	**AI in Cyber security**				
Course Code	**:**	**BAI703A**				
Course Type (Theory/Practical/ Integrated)	**:**	**Theory**				
Category	**:**	**PEC-1**				
Stream	**:**	**AIML**		**CIE**	**:**	**50**
Teaching hours/ week (L:T:P:S)	**:**	**3:0:0:0**		**SEE**	**:**	**50**
Total Hours	**:**	**40**		**SEE Duration**	**:**	**3 Hrs.**
Credits	**:**	**3**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	To understand the fundamentals of Artificial Intelligence in cybersecurity systems.
2	To Apply machine learning techniques used in cyber defense operations.
3	To Apply and explore deep learning approaches for fraud detection and cyber attack analysis.
4	To Analyse AI-driven intrusion detection and threat intelligence systems.
5	To Analyse security challenges, privacy issues, and future directions of AI-based cybersecurity.

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.

- Ask at least three HOTS (Higher-order Thinking Skills) module-wise questions to promote critical thinking.
- Adopt Problem-Based Learning (PBL), which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve Teaching-Learning Process (TLP).

DSATM

Scheme of Teaching and Examinations for BE Programme -2025-26

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2025-26)

COURSE CURRICULUM

Module No.	Topics	Hours
1	Introduction to cybersecurity. Cyber threats, vulnerabilities, and attacks, Role of Artificial Intelligence in cybersecurity, Principles and paradigms of AI in cyber defense, Cognitive computing technologies Machine learning fundamentals, Data analytics for cybersecurity applications **Text Book 1: Chapter 1 and 2** Practical based learning: • Develop a Python program to perform exploratory data analysis on a cybersecurity dataset and visualize the distribution of normal and attack traffic. Develop a machine learning model using decision tree or logistic regression to classify network traffic as normal or malicious.	8
Pedagogy	**ICT Learning**	
2	Machine learning techniques for cybersecurity, Data preprocessing and feature extraction, Network traffic analysis, Classification algorithms for attack detection, Security analytics and threat monitoring, AI-based cyber defense systems **Text Book 1 Chapter 3** Practical based learning:	8

	• Develop a machine learning–based intrusion detection system using Random Forest or Support Vector Machine to detect network attacks. • Develop a program to perform network anomaly detection using unsupervised learning techniques such as K-Means clustering or Isolation Forest.	
Pedagogy	**ICT Learning**	
3	Financial cybercrime and fraud detection, Credit card fraud detection systems, Deep neural networks for anomaly detection, Transaction behavior analysis, Fraud detection performance metrics **Text Book 1 Chapter 4** Practical based learning: • Develop a machine learning model to detect fraudulent credit card transactions using classification algorithms. • Develop a deep learning model using neural networks to identify fraudulent financial transactions from a transaction dataset.	**8**
Pedagogy	**ICT Learning**	
4	Intrusion Detection Systems (IDS), Malware detection using AI, Intelligent security monitoring systems, Advanced Persistent Threats (APT), Cybersecurity kill chain model, AI-based cyber defense strategies **Text Book 1 Chapter 5 and 6** Practical based learning: • Develop a machine learning model to classify malware samples and benign files using cybersecurity datasets. • Develop a neural network–based intrusion detection system to identify cyber attacks in network traffic data.	**8**
Pedagogy	**ICT Learning**	
5	Adversarial attacks on AI models, Security vulnerabilities in AI systems, AI-enabled authentication systems, Biometric security mechanisms, Privacy and ethical issues in AI cybersecurity, Future trends in AI-driven cyber defence.	**8**

	Text Book 1 Chapter 7,8 and 9 Practical based learning: • Develop a program to demonstrate adversarial attacks on a machine learning classifier and analyze its vulnerability. • Develop a machine learning–based biometric authentication system for user identity verification.	
Pedagogy	**ICT Learning**	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	Artificial Intelligence in Cyber Security: Theories and Applications is a 2023 Springer Publisher: Springer Cham (2023)Series: Intelligent Systems Reference Library, Vol. 240, ISBN: 978-3-031-28581-3 (eBook)
2	Artificial Intelligence for Cybersecurity Michele Stamp, Giuseppe Visaggio, Fabio Mercaldo, Fabio Di Troia, Springer Nature, 2020, ISBN: 978-3-030-60136-9
Reference Books	
1	Practical AI for Cybersecurity Ravi Das Auerbach Publications (CRC Press / Taylor & Francis) 2021
2	Hands-On Artificial Intelligence for Cybersecurity, Alessandro Parisi Packt Publishing Limited

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	Explain the fundamentals of AI and its role in cybersecurity systems	**Understand**	**L1/L2**
CO2	Apply machine learning techniques for cyber threat detection	**Apply**	**L3**
CO3	Analyze deep learning models used in fraud detection systems	**Analyze**	**L4**

CO4	Design AI-based systems for detecting advanced cyber attacks	**Design**	**L5**
CO5	Evaluate security vulnerabilities and ethical challenges in AI-driven cybersecurity	**Create**	**L6**

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	–	1	–	–	–	–	–	–	–	–	–	1	-	-	-
CO2	3	3	1	2	3	–	–	–	–	–	–	2	-	-	-
CO3	2	3	1	2	3	–	–	–	–	–	–	2	-	-	-
CO4	2	3	3	2	3	–	–	–	1	1	–	2	-	2	-
CO5	1	2	–	1	–	2	–	3	1	–	–	2	-	-	2

Weblinks and Video Lectures (e-Resources)	
1	https://stanford.edu/~shervine/teaching/cs-229/
2	https://learn.microsoft.com/en-us/training/
3	https://www.kaggle.com/learn
4	https://ocw.mit.edu

CIE- Continuous Internal Evaluation (50 Marks)

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test -1			Test -2				
	Module-1	Module-2	Module-2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	10	10		15			35	70%
CO2			5		5		10	20%
CO3						5	5	10%
CO4							--	--

CO5							--	--
Total	10	10	5	15	5	5	50	100%

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	10
Understand	10
Apply	15
Analyse	15
Evaluate	-
Design	-

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	5	5				10	20
CO2	5		5			10	20
CO3		5	5			10	20
CO4				5	5	10	20
CO5				5	5	10	20
Total	10	10	10	10	10	50	20

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**Seventh**				
Course Title	:	**Edge AI Frameworks**				
Course Code	:	**BAI703B**				
Course Type (Theory/Practical/Integrated/Project)	:	**Theory**				
Category	:	**PEC-1**				
Stream	:	**AIML**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**3:0:0:0**		**SEE**	:	**50**
Total Hours	:	**40T**		**SEE Duration**	:	**3Hrs.**
Credits	:	**3**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	To explain the fundamentals of Edge AI, edge computing architecture, and embedded AI systems.
2	To apply model optimization techniques such as quantization, pruning, and compression for efficient Edge AI deployment.
3	To analyze hardware platforms and embedded systems used for deploying AI models on edge devices.
4	To design and deploy AI models using Edge AI frameworks and tools.
5	To create and evaluate real-world Edge AI applications in domains such as IoT, smart cities, healthcare, and autonomous systems.

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.

- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

DSATM

Scheme of Teaching and Examinations for BE Programme -2025-26

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2025-26)

COURSE CURRICULUM

Module No.	Topics	Hours
1	**A Brief Introduction to Edge AI:** Defining key terms, why do we need Edge AI? **Edge AI in the Real World:** Common Use Cases for Edge AI, Types of Applications, Building Applications Responsibly **The Hardware of Edge AI:** Sensors, Signals and Sources of Data, Processors for Edge AI **Textbook 1: Chapters 1, 2, 3**	8
Pedagogy	**ICT Based Learning**	
2	**Algorithms for Edge AI:** Feature Engineering, Artificial Intelligence Algorithms **Tools and Expertise:** Building a team for AI at the Edge, Tools of the Trade **Understanding and Framing Problems:** The Edge AI Workflow, Do I need Edge AI?, Determining Feasibility **Textbook 1: Chapters 4, 5, 6**	8
Pedagogy	**ICT Based Learning**	
3	**How to Build a Dataset:** What does a Dataset Look Like?, The Ideal Dataset, Dataset and Domain Expertise, Data, Ethics and Responsible AI, Data Centric Machine Learning, Estimating Data Requirements, Getting Your Hands on Data, Storing and Retrieving Data, Ensuring Data Quality, Preparing Data, Building a Dataset over Time **Designing Edge AI Applications:** Product and Experience Design, Architectural Design, Accounting for Choices in Design **Textbook 1: Chapters 7, 8**	8

Pedagogy	**ICT Based Learning**	
4	**Developing Edge AI Applications:** An Iterative Workflow for Edge AI Development **Evaluating, Deploying, and Supporting Edge AI Applications:** Evaluating Edge AI Systems, Deploying Edge AI Applications, Supporting Edge AI Applications **Textbook 1: Chapters 9, 10**	**8**
Pedagogy	ICT Based Learning	
5	**Use Case: Wildlife Monitoring** **Use Case: Food Quality Assurance** **Use Case: Consumer Products** **Problem Exploration, Solution Exploration, Goal Setting, Solution Design, Dataset Gathering, DSP and Machine Learning Workflow, Testing the Model, Deployment, Iterate and Feedback Loops, AI for Good** **Textbook 1: Chapters 11, 12, 13**	**8**
Pedagogy	**ICT Based Learning**	
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	AI at the Edge: Solving Real-World Problems with Embedded Machine Learning by Daniel Situnayake and Jenny Plunkett, O'Reilly Media
2	TinyML: Machine Learning with TensorFlow Lite on Arduino and Ultra-Low-Power Microcontrollers by Pete

	Warden and Daniel Situnayake, O'Reilly Media, 2019.
Reference Books	
1	Deep Learning by Ian Goodfellow, Yoshua Bengio, Aaron Courville – MIT Press
2	Designing Machine Learning Systems An Iterative Process for Production-Ready Applications by Chip Huyen - O'Reilly Media
3	Designing Machine Learning Systems by Chip Huyen - O'Reilly Media

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	To explain the fundamentals of Edge AI, edge computing architecture, and embedded AI systems.	Understand	L1/L2
CO2	To apply model optimization techniques such as quantization, pruning, and compression for efficient Edge AI deployment.	Apply	L3
CO3	To analyze hardware platforms and embedded systems used for deploying AI models on edge devices.	Analyze	L4
CO4	To design and deploy AI models using Edge AI frameworks and tools.	Design	L5
CO1	To explain the fundamentals of Edge AI, edge computing architecture, and embedded AI systems.	Understand	L1/L2

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	**-**
CO2	**3**	-	-	-	-	-	-	-	-	-	-	-	**-**	**1**	**-**
CO3	-	**3**		-	-	-	-	-	-	-	-	-	-	**-**	**2**
	-	-	**3**		**1**	-	-	-	**2**	**2**	**1**	-	**-**	**2**	**-**

CO4															
CO5	-	-	-	**3**	-	-	-	-	**2**	**2**	-	-	**1**	**-**	**-**

Weblinks and Video Lectures (e-Resources)	
1	https://www.simplilearn.com/tutorials/data-science-tutorial/what-is-data-science
2	https://www.youtube.com/watch?v=N6BghzuFLIg
3	https://www.coursera.org/lecture/what-is-datascience/fundamentals-of-data-science-tPgFU

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	**Theory**			
	Continuous Assessment Tests (IAT)		**Continuous Comprehensive Assessment (CCA)**	
	IAT-1	**IAT-2**	**CCA-1**	**CCA-2**
	50 Marks	**50 Marks**	**50 Marks**	**50 Marks**
Remember	10	5	**-**	**-**
Understand	10	5	**-**	**-**
Apply	15	20	**-**	**-**
Analyze	15	20	20	10
Evaluate	-	-	15	20
Create	-	-	15	20

CIE Course Assessment Plan

CO's	**Marks Distribution**						**Total Marks**	**Weightage**
	Test-1			**Test-2**				
	Module-1	**Module-2**	**Module 2 to 2.5**	**Module-2.5 to 3**	**Module-4**	**Module-5**		
CO1	**4**	**3**	**3**	**-**	**-**	**-**	**10**	**20%**
CO2	**6**	**6**	**-**	**2**	**-**	**-**	**14**	**30%**
CO3	**-**	**-**	**3**	**2**	**4**	**4**	**13**	**24%**
CO4	**-**	**-**	**-**	**-**	**4**	**3**	**07**	**14%**
CO5	**-**	**-**	**-**	**-**	**3**	**3**	**06**	**12%**

Total	10	9	6	4	11	10	50	100%

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	12
Understand	13
Apply	15
Analyse	10
Evaluate	--
Create	--

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	3	2	3	-	2	2	12	24%
CO2	3	3	-	3	2	2	13	26%
CO3	--	--	5	-	5	5	15	30%
CO4	--	--	-	1	2	2	5	10%
CO5	--	--	-	-	2	3	5	10%
Total	6	5	8	4	13	14	50	100%

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**Seventh**				
Course Title	:	**AI in Entrepreneurship & Innovation**				
Course Code	:	**BAI704A**				
Course Type (Theory/Practical/Integrated/Project)	:	**Theory**				
Category	:	**OEC-2**				
Stream	:	**AIML**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**3:0:0:0**		**SEE**	:	**50**
Total Hours	:	**40T**		**SEE Duration**	:	**3 Hrs.**
Credits	:	**3**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	**Understand** the fundamental concepts of Artificial Intelligence and their relevance to entrepreneurship and innovation.
2	**Apply** how AI technologies enable new business models and innovative solutions across industries.
3	**Analyze** the role of AI in identifying market opportunities and improving decision-making in startups
4	**Illustrate** ethical, social, and economic implications of adopting AI in entrepreneurial ventures
5	Encourage students to develop innovative ideas and AI-based solutions for real-world business problems.

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.

- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

DSATM

Scheme of Teaching and Examinations for BE Programme -2025-26

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2025-26)

COURSE CURRICULUM

Module No.	Topics	Hours
1	The Role and Promise of Entrepreneurship: Entrepreneurship in Context, Economics and the Firm, Creative Destruction, Innovation and Technology, The Technology Entrepreneur, Spotlight on Facebook. Opportunities: Types of Opportunities, Market Engagement and Design Thinking, Types and Sources of Innovation, Trends and Convergence, Opportunity Evaluation, Spotlight on Solazyme **TextBook 1: Chapter 1 (Page 1-21), Chapter 2 (Page 25-46)**	8
Pedagogy	**ICT Based Learning**	
2	DBI Contributions to Digital Strategic Revolution, Understand DBI, Intelligent Business Innovation: Signals and Drivers, Making It Happen—Overcoming Hurdles, Known Opportunities to New Opportunities, Opportunities Created by Technologies, Intelligent Business Innovation Life Cycle, Intelligent Business Innovation Matrix, Identifying the Need of IBI. Digital Culture, Digital Collaboration and Digital Culture, Rationality and Digital Maturity, Going Ahead with Digital Maturity with Digital Technologies, Digital Transformation and Maturity, Explainability and Digital Maturity, Returns on Investment and Digital Maturity **Textbook 2: Chapter 1 (Page 1-19), Chapter 2 (Page 21-33)**	8
Pedagogy	**ICT Based Learning**	
3	Digital Innovation Strategies: Introduction, Digital Innovation Strategy, Digital Innovation Strategy—Case Study, Understand Digital Innovation to Build Learning	8

	Organization in Digital Era, Digital Innovation Strategy to Deliver Value Objectives of Digital Innovation Strategy, Selection of Right Technologies, Use of Right Data, Knowledge Innovation, Digital Innovation Strategy—Technology Building Blocks Technology Landscape for Competitive Edge: Transformation and Innovation, Strategic Embarkation, Intelligent Business Innovation—Role of AI Intelligence and Agent Types **TextBook 2: Chapter 3 (Page 37-54), Chapter 4 (Page 55-72)**	
Pedagogy	**ICT Based Learning**	
4	Digital and Intelligent Collaboration: On the Path of Embedding Artificial Intelligence into Business, Artificial Intelligence and Collaboration, Meeting Room Collaboration to Digital and Intelligent Collaboration Information Retrieval and Intelligent Digital Collaboration, Question Answering and Virtual Collaboration, Cross-Organizational, Cross-Border Collaboration, Working from Home and More Intelligent Business Transformation Through Co-working, Workforce Automation Increasing Role of AI in Work that Humans Can and Cannot Do: Emergence of Computers in Work that Humans Performed, Impact of Internet, Social Media, and the Era of Big Data, AI-Driven Automation, Challenges to AI-Driven Workforce Automation **TextBook 2: Chapter 5 (Page 73-88), Chapter 6 (Page 89-109)**	**8**
Pedagogy	ICT Based Learning	
5	Intelligent Technologies: Generative AI and Enterprise LLM: Intelligent Digital Evolution, Advanced Learning Technologies, AI and Machine Learning, Types of Machine Learning and Addressing Business Needs, Intelligent Recommendation and Transformation in Product Navigation Space, Cloud and Edge Computing in Digital Transformation, Edge Computing, Creative Collaborative Learning, Generative Paradigm and Enterprise LLM, Challenges for GenAI-Based Systems, Technological Side Effects and Ethical Concerns. Digital Innovation Leadership Sustainable Business Through Digital Innovation, Innovation Light Bulb, Data-Driven Insights: Extracting Value from Big Data	**8**

	to Transform Business, Ecosystem and Platform Dynamics, AI and Automation as Core Drivers, Sustainability and Social Responsibility, Technological Convergence **Textbook 2: Chapter 7 (Page 105-125), Chapter 8 (Page 127-143)**	
Pedagogy	**ICT Based Learning**	
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	Thomas H. Byers, Richard C. Dorf, Andrew J. Nelson Technology Ventures: From Idea To Enterprise McGrawHill 4th edition
2	Parag Kulkarni, Jay Rajasekera, Bidyut Baran Chaudhuri AI Empowered, Digital Business Innovation Springer series Edition
Reference Books	
1	Tom Taulli Artificial Intelligence Basics: A Non-Technical Introduction Apress 2019
2	Doug Rose Artificial Intelligence for Business McGraw-Hill 2020
3	Doug Hudgeon and Richard Nichol Machine Learning for Business

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	**Understand** the fundamental concepts of Artificial Intelligence, entrepreneurship, and innovation	Remember/ Understand	L1/L2
CO2	**Apply** AI tools and techniques to identify business opportunities and solve entrepreneurial problems.	Apply	L3
CO3	**Analyze** the impact of AI technologies on business models, innovation strategies, and startup ecosystems	Analyze	L4
CO4	**Evaluate** the feasibility and ethical implications of implementing AI solutions in entrepreneurial ventures.	Design	L5
CO5	**Design and develop** innovative AI-based business ideas or solutions to address real-world challenges.	Create/ Investigate	L6

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	3	-	-	-	-
CO3	-	-	3	-	-	-	-	-	-	-	3	-	-	-	-
CO4	-	-	-	3	-	2	-	2	-	2	3	3	-	2	-
CO5	-	-	-	-	2	-	-	-	2	2	3	-	-	-	2

Weblinks and Video Lectures (e-Resources)	
1	https://www.youtube.com/watch?v=1N3oqYhzHv4
2	https://www.youtube.com/watch?v=RWgW-CgdIk0

Bloom's Category	Theory			
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks
Remember	10	5	-	-
Understand	10	5	-	-
Apply	15	20	-	-
Analyze	15	20	20	10
Evaluate	-	-	15	20
Create	-	-	15	20

CIE- Continuous Internal Evaluation (50 Marks)

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	10	10		15			35	70%
CO2			5		5		10	20%
CO3						5	5	10%
CO4							--	--
CO5							--	--
Total	10	10	5	15	5	5	50	100%

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	5
Understand	5
Apply	10
Analyse	10
Evaluate	10
Create	10

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	3	2	3	-	2	2	12	24%
CO2	3	3	-	3	2	2	13	26%
CO3	--	--	5	-	5	5	15	30%
CO4	--	--	-	1	2	2	5	10%
CO5	--	--	-	-	2	3	5	10%
Total	6	5	8	4	13	14	50	100%

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**Seventh**				
Course Title	:	**AI in Sustainability**				
Course Code	:	**BAI704B**				
Course Type (Theory/Practical/Integrated/Project)	:	**Theory**				
Category	:	**OEC-2**				
Stream	:	**AIML**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**3:0:0:0**		**SEE**	:	**50**
Total Hours	:	**40T**		**SEE Duration**	:	**3 Hrs.**
Credits	:	**3**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	To understand the principles of sustainability and the challenges of environmental management.
2	To apply Artificial Intelligence in addressing energy efficiency, resource optimization, and environmental monitoring.
3	To analyze the impact of AI technologies on sustainable development and decision-making.
4	To explore methods for designing green computing and sustainable IT systems.
5	To investigate mechanical monitoring techniques, vibration analysis, fault detection, and predictive maintenance in engineering systems.

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.

- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

DSATM

Scheme of Teaching and Examinations for BE Programme -2025-26

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2025-26)

COURSE CURRICULUM

Module No.	Topics	Hours
1	Introduction to Sustainability and AI: Concept of sustainability, environmental challenges, Sustainable Development Goals (SDGs), role of Artificial Intelligence in sustainability, overview of AI technologies. **(T1: Chapter 1 pp. 1–16 and Chapter 2 pp. 34–60, T2: Chapter 1 pp. 3–20)**	8
Pedagogy	**ICT Based Learning**	
2	**AI for Energy and Resource Management**: AI applications in energy management, renewable energy forecasting, smart grids, resource optimization using AI, intelligent systems for efficient resource utilization. **(T1: Chapter 2 pp. 34–60 and Chapter 18 pp. 695–720, T2: Chapter 5 pp. 145–170)**	8
Pedagogy	**ICT Based Learning**	
3	**AI for Environmental Monitoring:** AI applications in environmental monitoring, climate prediction, remote sensing and satellite data analysis, biodiversity monitoring, pollution and waste management. **(T1: Chapter 20 pp. 725–750, T2: Chapter 6 pp. 171–195)**	8
Pedagogy	**ICT Based Learning**	
4	**Sustainable Computing and Green AI:** Green computing concepts, energy-efficient computing systems, sustainable data centers, carbon footprint of AI models, techniques for reducing energy consumption in computing. **(T2: Chapter 4 pp. 110–135 and Chapter 5 pp. 145–170)**	8
Pedagogy	ICT Based Learning	

5	**Mechanical Monitoring / Condition Monitoring:** Fundamentals of mechanical condition monitoring, vibration analysis, causes of machine faults (imbalance, misalignment, bearing wear, rotor bow), instrumentation and sensors for monitoring, spectral and signal analysis for fault detection, trend monitoring, predictive maintenance techniques. **(T3: Chapter 4 pp. 93–108; T4: Chapter 3 pp. 27–54 and Chapter 5 pp. 75–96)**	**8**
Pedagogy	**ICT Based Learning**	
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, Pearson.
2	San Murugesan, Green IT: Sustainable Strategies and Applications, Wiley.
3	A. R. Mohanty, Machinery Condition Monitoring: Principles and Practices, CRC Press
4	Juan Carlos A. Jauregui Correa & Alejandro A. Lozano Guzman, Mechanical Vibrations and Condition Monitoring, Elsevier
Reference Books	
1	Virginia Dignum, Responsible Artificial Intelligence, Springer.
2	National Academies of Sciences, Artificial Intelligence and Environmental Sustainability.

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	**Ability to understand** the fundamental concepts of sustainability and the role of Artificial Intelligence in sustainable development.	Remember/ Understand	L1/L2
CO2	**Capability to apply** AI techniques to improve energy efficiency, resource	Apply	L3
CO3	**Capability to analyze** AI applications in environmental monitoring, climate prediction, and sustainable systems.	Analyze	L4
CO4	**Ability to design** sustainable computing solutions using green computing and AI techniques.	Design	L5
CO5	**Capability to investigate** innovative AI-based approaches for addressing real-world sustainability challenges.	Create/ Investigate	L6

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	2	3	-	-	-	-	2	-	-	-
CO2	3	3	2	-	3	-	3	-	-	-	-	2	-	-	-
CO3	2	3	2	2	-	2	3	-	-	-	-	2	-	-	-
CO4	3	2	3	-	3	-	3	-	-	-	-	2	-	2	-
CO5	2	2	-	-	-	2	3	3	-	2	-	3	-	-	2

Weblinks and Video Lectures (e-Resources)	
1	https://sdgs.un.org
2	https://nptel.ac.in

3	https://ai.google/education

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory			
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks
Remember	10	5	-	-
Understand	10	5	-	-
Apply	15	20	-	-
Analyze	15	20	20	10
Evaluate	-	-	15	20
Create	-	-	15	20

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	10	10		15			35	70%
CO2			5		5		10	20%
CO3						5	5	10%
CO4							--	--
CO5							--	--
Total	10	10	5	15	5	5	50	100%

SEE- Semester End Examination (50 Marks)

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	3	2	3	-	2	2	12	24%
CO2	3	3	-	3	2	2	13	26%
CO3	--	--	5	-	5	5	15	30%
CO4	--	--	-	1	2	2	5	10%
CO5	--	--	-	-	2	3	5	10%
Total	6	5	8	4	13	14	50	100%

SEE Course Plan

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	5
Understand	5
Apply	10
Analyse	10
Evaluate	10
Create	10

Subject Identified for Project Based Learning

Semester	7th
Subject Identified for PBL	Project Work Phase 2
Prerequisite	Proposed Model Implementation Requirements
Justification for the selected subject	Designed to bridge the gap between theoretical knowledge and practical application. Necessary for producing industry-ready graduates with critical thinking, technical expertise, and real-world problem-solving skills.
List of possible projects	1.Projects that address the Society related Problems 2.Projects that incorporate Argentic AI Methods

Signature of the Guide **Signature of HOD**

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	**:**	**Seventh**				
Course Title	**:**	**Capstone Project Phase - 2**				
Course Code	**:**	**BAI705**				
Course Type (Theory/Practical/Integrated/Project)	**:**	**Project**				
Category	**:**	**PROJ-2**				
Stream	**:**	**AIML**		**CIE**	**:**	**100**
Teaching hours/ week (L:T:P:S)	**:**	**0:0:0:14**		**SEE**	**:**	**100**
Total Hours	**:**	**14 Project**		**SEE Duration**	**:**	**3 Hrs.**
Credits	**:**	**7**				

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**

DSATM

Scheme of Teaching and Examinations for BE Programme -2025-26

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2025-26)

COURSE CURRICULUM

Course objectives:

- Recall and explain fundamental facts, definitions, and theories related to the project area
- Apply theoretical knowledge to real-world scenarios or practical problems within the project domain.
- Critically Analyze complex concepts or systems into their constituent parts for deeper understanding.
- Critically assess the effectiveness of methodologies, techniques, or solutions employed in the project
- Develop innovative solutions or proposals by combining different elements or approaches within the project domain.

Course outcomes:

At the end of the course the student will be able to:

- Ability to Understand fundamental facts, definitions, and theories related to the project area
- Ability to Apply theoretical knowledge to real-world scenarios or practical problems within the project domain.
- Ability to Analyze complex concepts or systems into their constituent parts for deeper understanding.
- Ability to Evaluate the effectiveness of methodologies, techniques, or solutions employed in the project
- Ability to Develop innovative solutions or proposals by combining different elements or approaches within the project domain.

2

CIE procedure for Project Work Phase - 2:

Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide. The CIE marks awarded for the project work, shall be based on the evaluation of the project work Report, project presentation skill, and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

Interdisciplinary: Continuous Internal Evaluation shall be group-wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable. The CIE marks awarded for the project work, shall be based on the evaluation of project work Report, project presentation skill, and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates. SEE procedure for Project Work: SEE for project work will be conducted by the two examiners appointed by the University. The SEE marks awarded for the project work shall be based on the evaluation of project work Report, project presentation skill, and question and answer session in the ratio 50:25:25..■	

Project Phase –II

Phase - II of an undergraduate engineering project, with a focus on implementation, testing, and final project delivery, is a critical stage in the project lifecycle. This phase typically follows the initial planning and design stages and involves bringing the project to life. Begin building the prototype or system based on the detailed design specifications. This involves coding, assembling hardware components, or implementing the necessary software. Implement features incrementally, allowing for regular testing and feedback. This iterative approach helps in identifying and addressing issues early in the implementation process.Test individual components or modules of the system in isolation to ensure they function correctly and meet the design specifications. Combine different modules or components and test their interactions to ensure they work seamlessly together.Test the entire system to ensure it meets the overall project requirements and functions as intended.Optimize the system for better performance, efficiency, and responsiveness based on the testing feedback.

Project Report to reflect any changes made during the implementation and testing phases. The final phase - II report should be drafted according to the university guidelines. A journal paper should be publihsed at the end of the project.

Figure : - Process to monitor Phase –II of Student projects

Review -1:

The focus of review - 1 is to check the system design andsoftware specifications status of the project and justify the developed algorithm.

Group No.	Sl. No	Name	USN	System Design (10 M)	Presentation (5M)	Q/A (5M)	Total (20M)
	1						
	2						
	3						
	4						

Review -2:

The agenda of the review – 2 will be project demonstration, draft copy of technical paper and to incorporation of the changes that were suggested in review– 1.

Group No.	Sl. No	Name	USN	Technical Paper (10)M	Draft Report (10 M)	Demo (10M)	Q/A (10M)	Total (40M)
	1							
	2							
	3							
	4							

Review -3:

If the group clears the review 2 then it can take review 3 based on the committee decision. The suggested corrections in review 2 will be checked in review 3. At review 3 the group should give the final project demo, submit the Phase – II report and published journal paper.

Group No.	Sl. No	Name	USN	Published Paper (10 M)	Final Report (10 M)	Final Demo (10M)	Q/A (10M)	Total (40M)
	1							
	2							
	3							
	4							

Marks Distribution:

CIE will be conducted for 100 marks. First 20 marks is for review 1, 40 marks for review 2. Second 40 marks will be for review 3. SEE 100 marks for the project shall be awarded (based on the quality of report and presentation skill, participation in the question and answer session) as per the University norms by the VTU appointed examiners.

Project Phase – II Rubrics				
CIE				**SEE**
Review 1 (A)	Review 2 (B)	Review 3 (C)	Total (A+B+C)	SEE will be evaluated for 100 marks
20	40	40	100	100

Note: Students those miss the review schedule will be evaluated for 5 marks lesser.

Semester	:	**Seventh**				
Course Title	:	**Indian knowledge systems**				
Course Code	:	**BIKS706**				
Course Type (Theory/Practical/Integrated/Project)	:	**Theory**				
Category	:	**IKS**				
Stream	:	**AIML**		**CIE**	:	**100**
Teaching hours/ week (L:T:P:S)	:	**1:0:0:0**		**SEE**	:	**-**
Total Hours	:	**15 Hrs**		**SEE Duration**	:	**-**
Credits	:	**0**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	To facilitate the students with the concepts of Indian traditional knowledge and to make them understand the Importance of roots of knowledge system
2	To make the students understand the traditional knowledge and analyse it and apply it to their day-to-day life

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2024-25)

COURSE CURRICULUM

Module No.	Topics	Hours
1	**Introduction to Indian Knowledge Systems (IKS):** Overview, Vedic Corpus, Philosophy, Character scope and importance, traditional knowledge vis-a-vis indigenous knowledge, traditional knowledge vs. western knowledge.	5
Pedagogy	**ICT Based Learning**	
2	**Traditional Knowledge in Humanities and Sciences:** Linguistics, Number and measurements- Mathematics, Chemistry, Physics, Art, Astronomy, Astrology, Crafts and Trade in India and Engineering and Technology	5
Pedagogy	**ICT Based Learning**	
3	**Traditional Knowledge in Professional domain:** Town planning and architecture Construction, Health, wellness and Psychology-Medicine, Agriculture, Governance and public administration, United Nations Sustainable development goals.	5
Pedagogy	**ICT Based Learning**	
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem-solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

Text Books

Sl. No.	Title of the Book/Name of the author/Name of the publisher/Edition and Year
1	Introduction to Indian Knowledge System- concepts and applications, B Mahadevan, Vinayak Rajat Bhat, Nagendra Pavana R N, 2022, PHI Learning Private Ltd, ISBN-978-93- 91818-21-0
2	Traditional Knowledge System in India, Amit Jha, 2009, Atlantic Publishers and Distributors (P) Ltd., ISBN-13: 978-8126912230,

Reference Books	
1	Knowledge Traditions and Practices of India, Kapil Kapoor, Avadesh Kumar Singh, Vol. 1, 2005, DK Print World (P) Ltd., ISBN 81-246-0334,

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	**Understand** the concept of the Indian Knowledge System and its	**Remember/**	**L1/L2**
CO2	Appreciate the need and importance of protecting traditional knowledge.	**Apply**	**L3**
CO3	Recognize the relevance of Traditional knowledge in different domains. .	**Analyze**	**L4**
CO4	Establish the significance of Indian Knowledge systems in the contemporary world.	**Design**	**L5**

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	3	-	-	-	1	-	-	-
CO2	-	-	-	-	-	2	-	-	-	-	-	-	-	1	-
CO3	-	-	2	2	-	-	-	-	-	-	-	-	-	-	1
CO4	-	-	-	-	-	3	2	-	-	-	-	-	-	1	-

Weblinks and Video Lectures (e-Resources)	
1	https://www.youtube.com/watch?v=LZP1StpYEPM
2	http://nptel.ac.in/courses/121106003/

CIE- Continuous Internal Evaluation (100 Marks)

ASSESSMENT AND EVALUATION PATTERN	
WEIGHTAGE	**100% (CIE)**
Quiz-I Quiz-II	Each quiz is evaluated for 10 marks adding up Quiz-II to **20 Marks.**
THEORY COURSE - (Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating)	
Test – I Test – II	Each test will be conducted for **25 Marks** adding upto **50 marks.** Final test marks will be reduced to **40 Marks**
EXPERIENTIAL LEARNING	**40**
Case Study-based Teaching-Learning	
Sector wise study & consolidation (viz., Engg. Semiconductor Design, Healthcare & Pharmaceutical, FMCG, Automobile, Aerospace and IT/ ITeS)	----
Video based seminar (4-5 minutes per student)	----
Maximum Marks for the Theory	----
Practical	----
Total Marks for the Course	**100**

8th SEMESTER

CAPSTONE PROJECT
PHASE-3 (PROJ)

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**Eight**				
Course Title	:	**Capstone Project Phase-3**				
Course Code	:	**BAI801**				
Course Type (Theory/Practical/Integrated/Project)	:	**Patent & Publication**				
Category	:	**PROJ**				
Stream	:	**AIML**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**0:0:0:8**		**SEE**	:	**50**
Total Hours	:	**8 Hrs**		**SEE Duration**	:	**3Hrs**
Credits	:	**4**				