CBSE | DEPARTMENT OF SKILL EDUCATION

CURRICULUM FOR SESSION 2021-2022

ARTIFICIAL INTELLIGENCE (SUB. CODE 843)

CLASS – XII

COURSE OVERVIEW:

AI is a discipline in computer science that focuses on developing intelligent machines, machines that can learn and then teach themselves. These machines, then, can process vast amounts of data than humans can, and several times faster. However, AI can go across all disciplines to change the world for the better– from creating new healthcare solutions, to designing hospitals of the future, improving farming and our food supply, helping refugees acclimate to new environments, improving educational resources and access, and even cleaning our oceans, air, and water supply. The potential for humans to improve the world through AI is endless, as long as we know how to use it.

OBJECTIVES OF THE COURSE:

In this course, the students will develop knowledge, skills and values to understand AI and its implications for our society and the world and to use AI to solve authentic problems, now and in the future. The students will engage with a host of multi-media online resources, as well as hands-on activities and sequence of learning experiences.

The following are the main objections of the course:

1. Develop informed citizens with an understanding of AI and the skills to think critically and knowledgeably about the implications of AI for society and the world
2. Develop engaged citizens with a rigorous understanding of how AI can be harnessed to improve life and the world we live in
3. Stimulate interest and prepare students for further study to take up careers as AI scientists and developers to solve complex real world problems

SCHEME OF UNITS

This course is a planned sequence of instructions consisting of units meant for developing employability and vocational competencies of students of Class XI opting for skill subject along with other education subjects. The unit-wise distribution of hours and marks for class XI is as follows:

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ARTIFICIAL INTELLIGENCE (SUBJECT CODE - 843)

Class XII (Session 2021-22)
Total Marks: 100 (Theory - 50 + Practical - 50)

	TERM	UNITS	NO. OF HOURS (Theory + Practical)	MAX. MARKS (Theory + Practical)
PART – A		**Employability Skills**		
	Term I	Unit 1: Communication Skills-IV	10	05
		Unit 2: Self-Management Skills-IV	10	
		Unit 3: ICT Skills-IV	10	
	Term II	Unit 4: Entrepreneurial Skills-IV	15	05
		Unit 5: Green Skills-IV	05	
		Total	**50**	**10**
PART – B		**Subject Specific Skills**		
	Term I	Unit 1: Capstone Project	10	20
		Unit 2: Model Lifecycle	10	
	Term II	Unit 3: Storytelling Through Data	15	20
		Total	**35**	**40**
PART – C		**Student Capstone Project (PRACTICAL)**		
		Student AI project Development & Presentation (Team work): Submission of Project Logbook and Video presentation	30	50
		Total	**30**	**50**
		GRAND TOTAL	**115 Hours**	**100**

DETAILED CURRICULUM/ TOPICS FOR CLASS XII

PART-A: EMPLOYABILITY SKILLS

S. No.	Units	Duration in Hours
1.	Unit 1: Communication Skills-IV	10
2.	Unit 2: Self-management Skills-IV	10
3.	Unit 3: Information and Communication Technology Skills-IV	10
4.	Unit 4: Entrepreneurial Skills-IV	15
5.	Unit 5: Green Skills-IV	05
	TOTAL	**50**

NOTE: **Detailed Curriculum/ Topics to be covered under Part A: Employability Skills can be downloaded from CBSE website**.

Part-B – SUBJECT SPECIFIC SKILLS

- **TERM I:**

Level 3: AI Innovate	• Unit 1: Capstone Project • Unit 2: Model lifecycle (Knowledge)

- **TERM II:**

Level 3: AI Innovate	• Unit 3: Storytelling through data (Critical and Creative thinking Skills)

DETAILED CURRICULUM/ TOPICS

AI Innovate - (Level 3)		

Unit 1:
Capstone
Project
	• Understanding the problem
	• Decomposing the problem through DT framework
	• Analytic Approach
	• Data Requirements
	• Data Collection
	• Modelling approach
	• How to validate model quality
	    ➢ By test-train split
	    ➢ Introduce concept of cross validation
	• Metrics of model quality by simple Maths and examples from small datasets – scaled up to capstone project (Apply)
	    ➢ RMSE- Root Mean Squared Error
	    ➢ MSE – Mean Squared Error
	    ➢ MAPE – Mean Absolute Percent Error
	• Introduction to commonly used algorithms and the science behind them
	• Showcase through a compelling story
		10 hours to complete basic levels.

Unit 2:
Model
lifecycle
(Knowledge)
	• Different aspects of Model
	    ➢ Train, test, validate,
	    ➢ What are hyper parameters
	    ➢ Commonly used platforms to build and run models (Introduction)
	    ➢ Recommended tools
	    ➢ Links to different platforms
	        o Watson
	• Lifecycle of an AI model
	    ➢ Build
	    ➢ Deploy
	    ➢ Retrain
		10 hours to complete basic levels.

AI Innovate - (Level 3)		
Unit 3: Story-telling through data (Critical and Creative thinking Skills)	• The Need for Storytelling 　o Information processing and recalling stories 　o Why is storytelling important? 　o Structure that story! • How to create stories? 　o Begin with a pen-paper approach 　o Dig deeper to identify the sole purpose of your story 　o Use powerful headings 　o Design a Road-Map 　o Conclude with brevity • Ethics of storytelling • Types of Data and Suitable Charts 　o Text [Wordclouds] 　o Mixed [Facet Grids] 　o Numeric [Line Charts/ Bar Charts] 　o Stocks [Candlestick Charts] 　o Geographic [Maps] • Stories During the Steps of Predictive Modeling 　o Data Exploration 　o Feature Visualizing 　o Model Creation 　o Model Comparisons • Best Practices of Storytelling • Reference Material /Online Resources: 　o Analytics Vidhya (https://www.analyticsvidhya.com/blog/2020/05/art-storytelling-analytics-data-science/) 　o Udemy: (https://www.udemy.com/course/tell-a-story-with-data/) 　o Coursera: (https://www.coursera.org/learn/intro-business-analytics) 　o Coursera: (https://www.coursera.org/learn/communicate-with-impact)	15 hours to complete basic levels.
Student Project Work (Practical)	Student capstone project development • Students to form teams and work on developing an AI based project • Resources like the AI Project Guide and AI Project LogBook to be used	30 hours

LIST OF EQUIPMENT/ MATERIALS:

The list given below is suggestive and an exhaustive list should be compiled by the teacher(s) teaching the subject. Only basic tools, equipment and accessories should be procured by the Institution so that the routine tasks can be performed by the students regularly for practice and acquiring adequate practical experience.

- Desktop Computer/ Laptop / Tablet
- Web cam (in case of desktop)
- Scanner
- Projector & Screen
- Printer
- Software: Microsoft Office Applications, Anaconda Navigator, Web Browser (preferably Google Chrome and/or Mozilla Firefox)
- Hub/switch
- Internet

CAREER OPPORTUNITIES:

- Data Scientist
- Data Architect
- ML Engineer
- Data Analyst
- Game Programmer
- Business Intelligence Developer
- Software Engineer – AI
- AI Research Scientist