



Artificial Intelligence Book

Subject Code 417

CBSE (Class 9 and 10)

Mastering Coding, and Artificial Intelligence with
Fun Activities for CBSE Schools



Authored By

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Artificial Intelligence Books (CBSE) Class 9 to 10

Feature	Class 9	Class 10
		
# of Pages	243	266
# of Chapters – Employability Skills	5	5
# of Chapters – Subject Specific Skills	4	7
# of Activities	30	30
CBSE Skill Subject Covered	Class 9 Artificial Intelligence Subject Code 417	Class 10 Artificial Intelligence Subject Code 417
Software and Hardware Used	Windows 10, PictoBlox Python, PictoBlox AI, PictoBlox Machine Learning Environment	Windows 10, PictoBlox Python, PictoBlox AI, PictoBlox Machine Learning Environment, Python Libraries
Competition	Access to Codeavour	Access to Codeavour
Technologies Covered	Employability Skills, Artificial Intelligence, Data Science and Machine Learning	Employability Skills, Artificial Intelligence, Data Science and Machine Learning
Sessions Required	Total 120 – (60 Lab Sessions, 60 Classroom Learning Sessions)	Total 120 – (60 Lab Sessions, 60 Classroom Learning Sessions)
Teacher Resources	Lesson Plan, Lecture Slides (Textual, Images, Video)	
Certification	Yes (15 lab activities)	Yes (15 lab activities)
Book Sections	Part A: Employability Skills Part B: Subject-specific Skills (AI) Part C: Lab Activities Part D: Project Work / Field Visit / Student Portfolio	Part A: Employability Skills Part B: Subject-specific Skills (AI) Part C: Lab Activities Part D: Project Work, CBSE Sample Paper with Answer
TOC for Employability Skills	Unit 1: Communication Skills - 1 Unit 2: Self-Management Skills – 1 Unit 3: ICT Skills – 1 Unit 4: Entrepreneurial Skills – 1 Unit 5: Green Skills – 1	Unit 1: Communication Skills - 2 Unit 2: Self-Management Skills – 2 Unit 3: ICT Skills – 2 Unit 4: Entrepreneurial Skills – 2 Unit 5: Green Skills – 2
TOC for Subject-specific Skills	Unit 1: Introduction to Artificial Intelligence (AI) Unit 2: AI Project Cycle Unit 3: Neural Network Unit 4: Introduction to Python	Unit 1: Introduction to Artificial Intelligence (AI) Unit 2: AI Project Cycle Unit 3: Advance Python Unit 4: Data Science Unit 5: Computer Vision Unit 6: Natural Language Processing Unit 7: Evaluation of AI Models

TOC for Lab Activities	Basics of Programming - 14 AI with PictoBlox - 8 ML with PictoBlox - 8	Advance Python - 18 OpenCV Basics - 4 AI with PictoBlox - 2 ML with PictoBlox - 6
TOC for Project Work	Capstone Project – Codeavour Sample Projects Built by Community	Capstone Project – Codeavour Sample Projects Built by Community Blueprint for Sample Question Paper for Class X (Session 2023-2024) Sample Question Paper for Class X (Session 2023-2024) Marking Scheme for Class X (Session 2023-2024)

FAQs about Class 9 and 10 AI Books

1. How does the content of the Class 9 AI book prepare students for future technological advancements?

The Class 9 AI book introduces foundational concepts of artificial intelligence, setting the stage for understanding future technologies. It covers basic Python programming and neural networks, equipping students with essential skills for future technological environments. The blend of theoretical knowledge and practical exercises ensures that students are not only aware of AI concepts but are also adept at applying them, fostering a mindset ready for continual learning and adaptation in a fast-evolving tech world.

2. In what ways does the Class 10 AI book advance upon the concepts introduced in Class 9?

Building on the Class 9 foundation, the Class 10 book delves into more advanced topics such as data science, computer vision, and natural language processing. This progression ensures a deeper understanding of AI's complex and multi-faceted nature. The inclusion of advanced Python programming and exploration of various AI models prepares students for higher-level AI challenges and applications, aligning their skills with the latest industry standards.

3. What is the role of employability skills in the AI curriculum for these classes?

Employability skills form a core part of the AI curriculum to prepare students for the workforce. These skills, encompassing communication, self-management, and ICT capabilities, are crucial for future professionals. They ensure students are not just technically sound but also possess the soft skills necessary to thrive in collaborative, dynamic work environments. This holistic approach helps in shaping well-rounded individuals who can effectively navigate and contribute to their future workplaces.

4. How do the lab activities in these books contribute to a student's understanding of AI?

Lab activities in these books are designed to reinforce theoretical concepts through practical application. By engaging in hands-on projects, students transition from mere observers to active participants in AI learning. These activities help demystify AI concepts, making abstract ideas tangible and understandable. This experiential learning is crucial in solidifying students' understanding and fostering an experimental and inquisitive approach towards AI.

5. Can you explain the significance of the 'Project Work' section in these AI courses?

The 'Project Work' section is pivotal as it allows students to apply their learned concepts to real-world scenarios. This segment of the curriculum fosters innovation and problem-solving skills. Projects aligned with Sustainable Development Goals instill a sense of responsibility and a broader perspective on how AI can be leveraged for global challenges. This approach nurtures creativity and a sense of purpose in students' AI activities.

6. What makes PictoBlox an effective tool for teaching AI concepts in these courses?

PictoBlox is an effective educational tool due to its user-friendly interface and engaging learning format. It simplifies complex AI concepts, making them accessible to younger learners. The interactive platform allows students to experiment with AI

applications in a guided environment, fostering a deep and intuitive understanding of AI principles and their practical implementations.

7. In what ways do these books integrate modern technological trends into the curriculum?

The AI books are structured to cater to diverse learning preferences. Theoretical lessons provide a solid conceptual framework, while practical activities and lab sessions address experiential learning needs. This combination ensures that all students, regardless of their learning style, can engage with and benefit from the AI curriculum.

8. How are ethical considerations in AI addressed in these books?

Ethical considerations are an integral part of the AI curriculum. The books discuss the implications of AI on privacy, societal norms, and potential biases in AI systems. This inclusion helps develop a generation of AI practitioners who are not only technically proficient but also ethically conscious, ensuring responsible development and use of AI technologies.

9. What is the approach of these books towards fostering creativity and innovation in AI learning?

The curriculum encourages creativity and innovation by providing opportunities for students to engage in project-based learning. These projects challenge students to think creatively, apply their knowledge to new situations, and innovate solutions for real-world problems. This approach fosters a mindset that is not just about learning AI but using it as a tool for creative problem-solving.

10. How do these AI books align with the future job market and career paths in technology?

The curriculum aligns with the future job market by incorporating skills and knowledge that are highly sought after in the tech industry. By focusing on current and emerging AI technologies, the courses prepare students for the evolving demands of tech careers, ensuring they are ready for future challenges and opportunities in the field.

11. Can you elaborate on the role of teacher resources provided with these books?

Teacher resources such as lesson plans and lecture slides play a critical role in effective curriculum delivery. These resources provide a structured framework for educators, ensuring consistency and comprehensiveness in teaching. They also offer guidance and support, enabling teachers to effectively impart AI knowledge and skills to their students.

12. How are the Lab Activities structured in these books?

The lab activities in the Class 9 and 10 AI books are designed to provide hands-on experience and practical application of the concepts taught in the theoretical sections. They are an integral part of the curriculum, bridging the gap between theory and practice.

Class 9 Lab Activities:

- The Class 9 book focuses on introducing the basics of programming, AI with PictoBlox, and machine learning (ML) with PictoBlox.
- Activities involve basic programming exercises in Python, allowing students to understand the fundamental principles of coding.
- The AI and ML activities use PictoBlox, an educational tool, to help students grasp the basics of artificial intelligence and machine learning in an interactive and engaging manner.
- These activities are designed to build a strong foundation in AI, providing essential skills and understanding that are further developed in Class 10.

Class 10 Lab Activities:

- The Class 10 book advances to more complex topics, including advanced Python programming, data science, computer vision, natural language processing (NLP), and more in-depth exploration of AI and ML.
- Lab activities in Class 10 include advanced Python exercises, which delve deeper into programming concepts and their applications in AI.
- The book also introduces OpenCV basics, providing students with hands-on experience in image processing and computer vision.
- Additionally, lab sessions incorporate more sophisticated AI and ML projects using PictoBlox, allowing students to apply their learning to more complex scenarios.

13. Is there a certification provided upon completion?

Yes, upon completion of the courses outlined in the Class 9 and 10 AI books, students are eligible for certification. This certification is predicated on the completion of certain criteria, which typically include the successful completion of lab activities and projects.

- For both Class 9 and 10, the certification is offered after students complete a specified number of lab activities.
- This certification serves as a formal recognition of the skills and knowledge acquired in the field of AI.
- It is particularly valuable for students as it adds to their academic portfolio and can be beneficial for future educational or career opportunities.

14. How many sessions are required for each course?

For both the Class 9 and Class 10 AI courses, a total of 120 sessions are required. These sessions are divided equally between lab sessions and classroom learning sessions.

- **Lab Sessions:** 60 sessions are dedicated to practical lab work. These sessions are crucial for hands-on learning and application of the theoretical concepts learned in the classroom.
- **Classroom Learning Sessions:** The remaining 60 sessions are for classroom learning, where theoretical aspects of AI, including concepts, principles, and theory, are taught.

This balanced approach ensures that students get a comprehensive learning experience, combining theoretical knowledge with practical skills.

15. What CBSE Skill Subject is covered in these books?

Both the Class 9 and Class 10 AI books cover the "Artificial Intelligence" skill subject under the Central Board of Secondary Education (CBSE), with the subject code 417.

- **Class 9 AI Curriculum:** It introduces students to the basics of AI, providing foundational knowledge and skills. The curriculum is designed to make students familiar with the concept of AI and its significance in the modern world.
- **Class 10 AI Curriculum:** This curriculum builds upon the foundation laid in Class 9. It delves deeper into AI, covering more advanced topics and preparing students for higher-level studies or careers in the field of AI.

The inclusion of this subject in the CBSE curriculum reflects the growing importance of AI in today's technological landscape and the need to equip students with the necessary skills and knowledge to navigate this evolving field.

Aligned with
NEP 2020

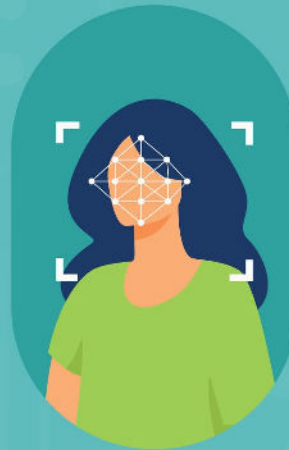
Secondary Stage



ARTIFICIAL INTELLIGENCE

AI in Action with Python: A hands-on Journey

CBSE Subject: 417



Code with
PictoBlox

INCLUDES

- Part A: Employability Skills
- Part B: Subject Specific Skills
- Part C: Lab Activities
- Part D: Project Work

9

Get proficient in Artificial Intelligence by engaging with hands-on activities and applying them to real-world applications.

CBSE AI Curriculum for Class 9 - Artificial Intelligence (Subject Code 417)

Total Marks: 100 (Theory – 50 + Practical 50)

Embracing the future begins with education. The CBSE Class 9 Artificial Intelligence curriculum, under Subject Code 417, is a pioneering step towards integrating advanced technology into secondary education. This curriculum is motivated by the growing significance of AI in our modern world. It aims to prepare students for the future by providing them with the tools and understanding necessary to navigate and contribute to a rapidly evolving technological landscape.

Key Aim of the Course

The core objective of this curriculum is to instil in students an in-depth understanding and appreciation of AI and its significant role in our daily lives. Targeted at Class 9 students, this course aims to prepare them not just academically but also for future career paths in the rapidly evolving tech world. It encompasses a balanced mix of theoretical knowledge and practical skills, especially in Python programming and AI project development.

Salient Features of the Book

The course content is meticulously divided into four parts, each with its unique focus and learning outcomes:

- **Part A: Employability Skills**

This section covers essential skills like communication, self-management, ICT skills, entrepreneurial skills, and green skills. It is designed to enhance students' overall personality and make them ready for future career challenges.

- **Part B: Subject Specific Skills**

Here, the students delve into the core concepts of AI, including an introduction to AI, the AI project cycle, neural networks, and basics of Python programming. This part forms the backbone of the course, offering in-depth knowledge of AI fundamentals.

- **Part C: Practical Work**

Practical application of theoretical knowledge is emphasised in this section. It includes extensive lab activities, focusing on Python programming and machine learning, to enhance students' hands-on experience.

- **Part D: Project Work / Field Visit / Student Portfolio**

Aligned with the Sustainable Development Goals, this segment encourages students to apply their learning in real-world scenarios, fostering a sense of responsibility and innovation.

Role of PictoBlox and Quarky in Enhancing Practical Learning

- **PictoBlox:** PictoBlox is an intuitive and engaging Python platform that simplifies complex AI concepts for students. It uses interactive activities such as image classification, object detection, and natural language processing to make learning AI accessible and enjoyable.
- **Quarky:** Quarky is a robotic tool that offers students a hands-on experience in robotics. It allows students to explore robotic movements, sensor usage, and control systems in a practical setting, thus deepening their understanding of robotics.

Chapter Specific Features

- **Modern Technological Content:** Tailored to match the technological interests of today's students.
- **Activity-Based Learning:** Focus on practical activities for interactive concept understanding.
- **Step-by-Step Guidance:** Detailed instructions for easy understanding of lessons and projects.
- **Challenging Exercises:** MCQ, answered short answer type questions, and higher-order questions to test and enhance topic comprehension.

Our goal is to develop technologically adept and innovative future leaders through this book. We welcome suggestions for its enhancement.

Scheme of Studies for Class 9 – AI Book | CBSE

This course is a planned sequence of instructions consisting of units meant for developing employability and vocational competencies of students of Class IX opting for skill subject along with other education subjects.

The unit-wise distribution of hours and marks for class IX is as follows:

	Units	No of Hours for Theory and Practical	Maximum Marks for Theory and Practical
PART A	Employability Skills		
	Unit 1: Communication Skills - 1*	10	-
	Unit 2: Self-Management Skills – 1	10	3
	Unit 3: ICT Skills – 1	10	3
	Unit 4: Entrepreneurial Skills – 1	15	4
	Unit 5: Green Skills – 1*	05	-
	Total	50	10
PART B	Subject Specific Skills		
	Unit 1: Introduction to Artificial Intelligence (AI)		10
	Unit 2: AI Project Cycle		15
	Unit 3: Neural Network		5
	Unit 4: Introduction to Python		10
	Total		40
PART C	Practical Work		
	Unit 4: Introduction to Python Practical File with Minimum 15 Programs		15
	Practical Examination <ul style="list-style-type: none"> • Simple programs using input and output function • Variables, Arithmetic Operators, Expressions, Data Types • Flow of Control and Conditions • Lists Any 3 Program based on the above topics		15
	Viva Voice		5
	Total		35
PART D	Project Work / Field Visit / Student Portfolio * relate it to Sustainable Development Goals		15
	Total		15
Grand Total		200	100

Note: * marked units are to be assessed through Internal Assessment/ Student Activities. They are not to be assessed in Theory Exams.

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Section 5	Modelling – AI, ML, DL, What is Modelling, Learning Based Approach, Rule Based Approach, Decision Tree, Pixel it Activity	128
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Section 3	Neural Networks Basics – Functionality, Working & Structure of a Neural Network, Type of Neural Networks, Evaluation Metrics	142
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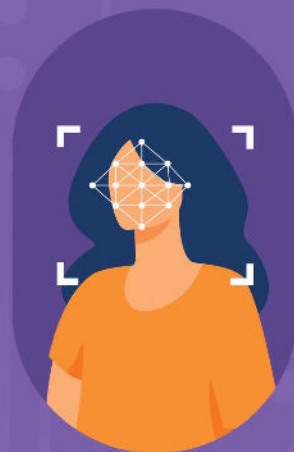
Secondary Stage



ARTIFICIAL INTELLIGENCE

AI in Action with Python: A hands-on Journey

CBSE Subject: 417



Code with
PictoBlox

INCLUDES

- Part A: Employability Skills
- Part B: Subject Specific Skills
- Part C: Lab Activities
- Part D: Project Work and
CBSE Sample Paper

10

Get proficient in Artificial Intelligence by engaging with hands-on activities and applying them to real-world applications.

CBSE AI Curriculum for Class 10 - Artificial Intelligence (Subject Code 417)

Total Marks: 100 (Theory – 50 + Practical 50)

Embracing the future begins with education. The CBSE Class 10 Artificial Intelligence curriculum, under Subject Code 417, is a pioneering step towards integrating advanced technology into secondary education. This curriculum is motivated by the growing significance of AI in our modern world. It aims to prepare students for the future by providing them with the tools and understanding necessary to navigate and contribute to a rapidly evolving technological landscape.

Key Aim of the Course

The core objective of this curriculum is to instil in students an in-depth understanding and appreciation of AI and its significant role in our daily lives. Targeted at Class 10 students, this course aims to prepare them not just academically but also for future career paths in the rapidly evolving tech world. It encompasses a balanced mix of theoretical knowledge and practical skills, especially in Python programming and AI project development.

Salient Features of the Book

The course content is meticulously divided into four parts, each with its unique focus and learning outcomes:

- **Part A: Employability Skills**

This section focuses on key skills needed in the workplace. It covers communication (verbal, non-verbal, and written), self-management including stress and time management, basic information technology skills, entrepreneurship fundamentals, and green skills for sustainable development.

- **Part B: Subject Specific Skills**

This part delves into advanced topics like Artificial Intelligence, covering its basics, ethics, and applications, and explores AI project cycles. It also includes advanced Python programming, data sciences, computer vision, and natural language processing, providing a comprehensive understanding of these cutting-edge fields.

- **Part C: Lab Activities on Python, AI, and ML**

This section consists of practical lab activities to reinforce learning in Python, AI, and Machine Learning. Activities range from basic Python operations to advanced applications in AI and ML, including data handling with Pandas, image processing with OpenCV, and exploring various AI models.

- **Part D: Project Work and Miscellaneous**

The final part of the book is dedicated to project work and additional resources. It includes a capstone project, sample projects, blueprints, and sample question papers for exams, along with their marking schemes and answer keys, providing a complete educational resource for students.

Role of PictoBlox in Enhancing Practical Learning

- **PictoBlox:** PictoBlox is an intuitive and engaging Python platform that simplifies complex AI concepts for students. It uses interactive activities such as image classification, object detection, and natural language processing to make learning AI accessible and enjoyable.

Chapter Specific Features

- **Modern Technological Content:** Tailored to match the technological interests of today's students.
- **Activity-Based Learning:** Focus on practical activities for interactive concept understanding.
- **Step-by-Step Guidance:** Detailed instructions for easy understanding of lessons and projects.
- **Challenging Exercises:** MCQ, answered short answer type questions, and higher-order questions to test and enhance topic comprehension.

Our goal is to develop technologically adept and innovative future leaders through this book. We welcome suggestions for its enhancement.

Scheme of Studies for Class 10 – AI Book | CBSE

This course is a planned sequence of instructions consisting of units meant for developing employability and vocational competencies of students of Class X opting for skill subject along with other education subjects.

The unit-wise distribution of hours and marks for class X is as follows:

	Units	No of Hours for Theory and Practical	Maximum Marks for Theory and Practical
PART A	Employability Skills		
	Unit 1: Communication Skills – II	10	10
	Unit 2: Self-Management Skills – II	10	
	Unit 3: ICT Skills – II	10	
	Unit 4: Entrepreneurial Skills – II	15	
	Unit 5: Green Skills – II	05	
	Total	50	10
PART B	Subject Specific Skills		
	Unit 1: Introduction to Artificial Intelligence (AI)	10	40
	Unit 2: AI Project Cycle	10	
	Unit 3: Advance Python	5	
	Unit 4: Data Science	15	
	Unit 5: Computer Vision	10	
	Unit 6: Natural Language Processing	10	
	Unit 7: Evaluation	10	
	Total	70	40
PART C	Practical Work		
	Practical Work: <ul style="list-style-type: none"> • Unit 3: Advance Python • Unit 4: Data Science • Unit 5: Computer Vision 	60	35
	Practical Examination		
	Viva Voice		
	Total	60	35
PART D	Project Work / Field Visit / Practical File / Student Portfolio	20	15
	Viva Voice		
	Total	20	15
	Grand Total	200	100

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