

SEVERN BUSINESS COLLEGE

SBC Level 6 Graduate Diploma in Artificial Intelligence

Course Handbook

Qualification
SBC Level 6 Graduate Diploma in Artificial Intelligence

Level
6

Guided Learning Hours
480

Total Qualification Time Hours
1200

Credit Value
120

Qualification Objective
The Graduate Diploma in Artificial Intelligence (AI) is a comprehensive program designed to provide learners with the necessary knowledge and skills in the field of AI. The course explores core AI concepts, techniques, and applications across diverse industries. It includes practical experience with machine learning, natural language processing, data analytics, and intelligent systems design, equipping students to pursue careers in AI and related fields. Upon completion, graduates will be capable of developing AI solutions, critically analyzing problems, and contributing to innovations in technology.

Assessment
Assessment is through practical assignments, with no exams - to more accurately reflect the real working environment.

Unit Structure of the Qualification
Level 6 Graduate Diploma in Artificial Intelligence (120 credits):

Units	Unit level	Unit credit
Introduction to Artificial Intelligence	6	20
Machine Learning Fundamentals	6	20
Natural Language Processing	6	20
Data Analytics and AI	6	20
Intelligent Systems Design	6	20
Advanced AI Techniques	6	20

Assessment Grades

Marks Ranges	Marking Criteria
Pass	All learning outcomes are achieved. All assessment criteria are met.
Fail	All learning outcomes are not achieved. All assessment criteria are not met.
No Marks	Plagiarism

UNIT SPECIFICATIONS

Unit Title
Introduction to Artificial Intelligence

Level
6

Guided Learning Hours
80

Learning Time Hours
200

Credit Value
20

Learning Outcomes and Assessment Criteria
The learning outcomes describe the abilities that learners will possess after they have completed the unit. The assessment criteria provide a list of achievements sufficient to demonstrate that a learner has met the learning outcomes.

Learning Outcome	Assessment Criteria

To achieve this unit a learner must:	*Assessment of this outcome will require a learner to demonstrate that they can:*
1. Understand the fundamentals of AI.	1.1 Define AI and explain its significance in modern computing. 1.2 Describe the history and evolution of AI technologies. 1.3 Identify and categorize the different types of AI systems. 1.4 Discuss the relationship between AI, machine learning, and deep learning.
2. Demonstrate an understanding of AI applications.	2.1 Identify the key areas where AI is applied (e.g., healthcare, finance, robotics). 2.2 Discuss case studies of AI applications in various industries. 2.3 Evaluate the benefits and challenges of implementing AI in real-world applications. 2.4 Analyze ethical issues related to AI applications.
3. Apply basic AI concepts to simple problems.	3.1 Solve a basic problem using a rule-based system. 3.2 Develop a simple AI system based on search algorithms. 3.3 Apply decision trees for problem-solving in AI tasks. 3.4 Implement an introductory AI model using a high-level programming language.
4. Communicate AI concepts effectively.	4.1 Prepare and deliver a presentation on a basic AI topic. 4.2 Write a clear report explaining the design of a simple AI system. 4.3 Use diagrams to explain AI algorithms. 4.4 Engage in discussions on AI developments in both technical and non-technical terms.

UNIT SPECIFICATIONS

Unit Title
Machine Learning Fundamentals

Level
6

Guided Learning Hours
80

Learning Time Hours
200

Credit Value
20

Learning Outcomes and Assessment Criteria
The learning outcomes describe the abilities that learners will possess after they have completed the unit. The assessment criteria provide a list of achievements sufficient to demonstrate that a learner has met the learning outcomes.

Learning Outcome *To achieve this unit a learner must:*	**Assessment Criteria** *Assessment of this outcome will require a learner to demonstrate that they can:*
1. Understand the basics of machine learning (ML).	1.1 Define machine learning and describe its types (supervised, unsupervised, reinforcement). 1.2 Explain the role of data in machine learning processes. 1.3 Identify common ML algorithms and their uses. 1.4 Discuss the importance of data pre-processing in ML tasks.
2. Implement simple machine learning algorithms.	2.1 Implement a linear regression model using a programming language. 2.2 Develop a classification model using a decision tree. 2.3 Build a clustering algorithm using K-means. 2.4 Train and evaluate machine learning models on sample datasets.
3. Evaluate machine learning models and results.	3.1 Explain how to split data into training and test sets. 3.2 Use performance metrics (e.g., accuracy, precision, recall) to evaluate models. 3.3 Identify overfitting and underfitting in machine learning models. 3..4 Apply techniques such as cross-validation for model evaluation.
4. Analyze the ethical implications of machine learning.	4.1 Discuss the biases inherent in machine learning models. 4.2 Examine the ethical considerations of data privacy in ML. 4.3 Evaluate the fairness of ML algorithms in different demographic groups. 4.4 Suggest measures to mitigate bias in ML systems.

UNIT SPECIFICATIONS

Unit Title
Natural Language Processing

Level
6

Guided Learning Hours
80

Learning Time Hours
200

Credit Value
20

Learning Outcomes and Assessment Criteria
The learning outcomes describe the abilities that learners will possess after they have completed the unit. The assessment criteria provide a list of achievements sufficient to demonstrate that a learner has met the learning outcomes.

Learning Outcome *To achieve this unit a learner must:*	**Assessment Criteria** *Assessment of this outcome will require a learner to demonstrate that they can:*
1. Understand the basics of natural language processing (NLP).	1.1 Define NLP and its role in AI applications. 1.2 Identify common NLP tasks (e.g., sentiment analysis, named entity recognition). 1.3 Explain the challenges of working with human language in NLP. 1.4 Describe NLP pipelines and their components.
2. Implement NLP tasks using relevant tools.	2.1 Perform tokenization and text preprocessing using an NLP library. 2.2 Apply part-of-speech tagging and syntactic parsing. 2.3 Implement sentiment analysis on a text corpus. 2.4 Build a named entity recognition system using NLP techniques.
3. Analyze and evaluate NLP models.	3.1 Evaluate the performance of NLP models using precision, recall, and F1 score. 3.2 Discuss the role of word embeddings in NLP. 3.3 Analyze the effectiveness of different NLP algorithms for specific tasks. 3.4 Implement a simple NLP model for text classification.
4. Discuss ethical and societal issues in NLP.	4.1 Identify ethical concerns in the use of NLP technologies. 4.2 Evaluate issues related to misinformation and bias in NLP. 4.3 Discuss the impact of NLP on privacy and security. 4.4 Suggest guidelines for responsible use of NLP in various industries.

UNIT SPECIFICATIONS

Unit Title
Data Analytics and AI

Level
6

Guided Learning Hours
80

Learning Time Hours
200

Credit Value
20

Learning Outcomes and Assessment Criteria

The learning outcomes describe the abilities that learners will possess after they have completed the unit. The assessment criteria provide a list of achievements sufficient to demonstrate that a learner has met the learning outcomes.

Learning Outcome *To achieve this unit a learner must:*	**Assessment Criteria** *Assessment of this outcome will require a learner to demonstrate that they can:*
1. Understand the relationship between AI and data analytics.	1.1 Define data analytics and its role in AI. 1.2 Discuss types of data analytics (descriptive, predictive, prescriptive). 1.3 Identify key data preprocessing steps in AI applications. 1.4 Explain how big data influences AI decision-making processes.
2. Apply data analysis techniques using AI tools.	2.1 Perform data cleaning and preprocessing tasks. 2.2 Use AI tools to analyze and visualize data trends. 2.3 Apply statistical methods to extract insights from datasets. 2.4 Build a predictive model using machine learning techniques.
3. Evaluate the impact of data analytics on decision-making.	3.1 Analyze the role of data analytics in business intelligence. 3.2 Discuss the use of AI-driven analytics in decision-making. 3.3 Assess the potential of AI for automating data analysis processes. 3.4 Evaluate the challenges of implementing AI in data analytics.
4. Understand the ethical concerns in data analytics.	4.1 Identify ethical issues in data collection and analysis. 4.2 Discuss the implications of data privacy and security in AI systems. 4.3 Evaluate the risks of using biased data in AI models. 4.4 Propose best practices for ensuring ethical AI data analytics.

UNIT SPECIFICATIONS

Unit Title
Intelligent Systems Design

Level
6

Guided Learning Hours
80

Learning Time Hours
200

Credit Value
20

Learning Outcomes and Assessment Criteria
The learning outcomes describe the abilities that learners will possess after they have completed the unit. The assessment criteria provide a list of achievements sufficient to demonstrate that a learner has met the learning outcomes.

Learning Outcome *To achieve this unit a learner must:*	**Assessment Criteria** *Assessment of this outcome will require a learner to demonstrate that they can:*
1. Understand the design principles of intelligent systems.	1.1 Define intelligent systems and their components. 1.2 Explain the different approaches to building intelligent systems. 1.3 Discuss the role of AI in decision support systems. 1.4 Analyze the requirements for creating autonomous systems.
2. Design and implement an intelligent system.	2.1 Identify the problem to be solved by the intelligent system. 2.2 Develop a system using rule-based or machine learning techniques. 2.3 Implement sensors and actuators in an autonomous system. 2.4 Create a user interface for interacting with the intelligent system.
3. Test and evaluate intelligent systems.	3.1 Design a test plan for the intelligent system. 3.2 Test the system's performance and reliability. 3.3 Use debugging and optimization techniques for system improvements. 3.4 Evaluate the system’s ability to adapt to different scenarios.
4. Discuss the ethical and social implications of intelligent systems.	4.1 Discuss the implications of AI in autonomous decision-making. 4.2 Evaluate the ethical concerns related to intelligent systems in society. 4.3 Propose solutions to prevent misuse of autonomous systems. 4.4 Assess the potential social impact of widespread intelligent systems.

UNIT SPECIFICATIONS

Unit Title
Advanced AI Techniques

Level
6

Guided Learning Hours
80

Learning Time Hours
200

Credit Value
20

Learning Outcomes and Assessment Criteria
The learning outcomes describe the abilities that learners will possess after they have completed the unit. The assessment criteria provide a list of achievements sufficient to demonstrate that a learner has met the learning outcomes.

Learning Outcome *To achieve this unit a learner must:*	**Assessment Criteria** *Assessment of this outcome will require a learner to demonstrate that they can:*
1. Explore advanced AI methodologies.	1.1 Discuss the role of deep learning in AI applications. 1.2 Explain reinforcement learning and its applications. 1.3 Identify the components of a neural network. 1.4 Evaluate the advantages of using generative models in AI.
2. Implement deep learning models.	2.1 Develop a simple neural network model for classification. 2.2 Train a deep learning model using convolutional neural networks (CNNs). 2.3 Implement a recurrent neural network (RNN) for time-series analysis. 2.4 Optimize a deep learning model using gradient descent techniques.
3. Apply advanced AI techniques to real-world problems.	3.1 Solve an AI problem using reinforcement learning. 3.2 Apply generative adversarial networks (GANs) to generate realistic images. 3.3 Implement a recommendation system using deep learning. 3.4 Develop an AI-based solution to a business or healthcare problem.
4. Address challenges and future directions in AI research.	4.1 Discuss the current limitations of deep learning and reinforcement learning. 4.2 Evaluate emerging trends in AI research and development. 4.3 Propose potential future advancements in AI technologies. 4.4 Critically assess the societal impact of future AI developments.