

# " EXIN BCS Artificial Intelligence Foundation"

## Course Introduction

### 1. Introduction to Artificial Intelligence

#### 1.1 Core AI Concepts and Definitions

- Human Intelligence
- Artificial Intelligence
- Machine Learning
- The Scientific Method

#### 1.2 Historical Development of AI

- Dartmouth Conference (1956)
- Asilomar Principles
- AI Winters
- Big Data and the Internet of Things (IoT)
- Rise of Large Language Models (LLMs)

#### 1.3 Types of Artificial Intelligence

- Narrow (Weak) AI
- General (Strong) AI
- Real-World Examples and Use Cases

#### 1.4 Impact of AI on Society

- Ethical Principles
- Social Impact
- Economic Impact
- Environmental Impact
- UN Sustainable Development Goals (SDGs)
- EU AI Act (2024)

#### 1.5 Sustainability and Environmental Considerations

- Green IT Initiatives
- Energy-Efficient Data Centers
- Sustainable Supply Chains
- Algorithm Selection

- Low-Code / No-Code Approaches
  - Environmental Impact Monitoring and Reporting
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## 2. Ethical and Legal Considerations in AI

### 2.1 Ethical Concerns in AI

- Ethics vs Law
- Bias, Fairness, and Discrimination
- Privacy and Data Protection
- Employment and Economic Impact
- Autonomous Systems and Liability

### 2.2 Guiding Principles for Ethical AI

- UK AI Principles
- Transparency and Explainability
- Accountability and Governance
- Contestability and Redress
- AI Governance Structures

### 2.3 Addressing Ethical Challenges in AI Projects

- Ethical Threats and Conflicts
- Bias Mitigation Strategies
- Openness and Transparency
- Trustworthiness and Explainability

### 2.4 Regulation and Standards for AI

- Need for Regulation
- AI Regulatory Landscape
- UK GDPR and Data Protection Act 2018
- International Standards (ISO, NIST)
- Risks of Unregulated AI

### 2.5 Risk Management in AI

- Risk Concepts and Definitions
- Risk Analysis Techniques (SWOT, PESTLE, Cynefin)
- AI-Related Regulations and Standards
- Risk Mitigation Strategies

- Ownership and Accountability
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### 3. Enablers of Artificial Intelligence

#### 3.1 Common Applications of AI

- Human-Compatible AI
- Wearables
- Edge AI
- Internet of Things (IoT)
- Generative AI Tools
- Autonomous Vehicles

#### 3.2 Robotics and Automation

- Definition of Robotics
- Intelligent vs Non-Intelligent Robots
- Types of Robots
- Robotic Process Automation (RPA)

#### 3.3 Machine Learning Fundamentals

- Machine Learning Concepts
- Neural Networks
- Deep Learning
- Large Language Models (LLMs)

#### 3.4 Core Machine Learning Concepts

- Prediction
- Classification
- Clustering
- Object Recognition
- Recommendation Systems

#### 3.5 Learning Approaches

- Supervised Learning
  - Unsupervised Learning
  - Semi-Supervised Learning
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## 4. Data in Artificial Intelligence

### 4.1 Key Data Concepts

- Big Data
- Data Visualization
- Structured, Semi-Structured, and Unstructured Data

### 4.2 Data Quality and Its Importance

- Accuracy
- Completeness
- Uniqueness
- Consistency
- Timeliness
- Impact of Poor-Quality Data

### 4.3 Data Risks and Mitigation

- Bias and Fairness
- Misinformation
- Legal and Processing Restrictions
- Regulatory Compliance
- Scientific Method in AI

### 4.4 Big Data Usage

- Storage and Processing
- User Understanding
- Process Improvement
- Experience Optimization

### 4.5 Data Visualization Techniques

- Written and Verbal
- Visual and Auditory
- Dashboards and Infographics
- Virtual and Augmented Reality

### 4.6 Generative AI Concepts

- Generative AI
- Large Language Models (LLMs)

## 4.7 Use of Generative AI

- Training on Large Datasets
- Prompt Engineering
- Natural Language Processing (NLP)
- Image Generation

## 4.8 Training AI Using Data

- Machine Learning Lifecycle
  - Data Selection and Preparation
  - Model Training and Testing
  - Continuous Learning and Review
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# 5. Using AI in Your Organization

## 5.1 Identifying AI Opportunities

- Automation
- Repetitive Tasks
- Content Creation

## 5.2 AI Business Case Development

- Business Case Structure
- Cost-Benefit Analysis
- Risk and Impact Assessment

## 5.3 Stakeholder Identification and Management

- Stakeholder Definition
- Power-Interest Grid
- Stakeholder Wheel

## 5.4 Project Management Approaches

- Agile
- Waterfall
- Hybrid

## 5.5 Risks, Costs, and Benefits

- Risk Analysis and Ownership
- Risk Appetite and Strategies
- Financial and Socio-Economic Impact
- Triple Bottom Line

## 5.6 AI Governance

- Compliance
  - Risk Management
  - Lifecycle Governance (Manage, Monitor, Govern)
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## 6. Future Planning and Societal Impact

### 6.1 AI Roles and Career Opportunities

- AI-Specific Roles
- Evolving Traditional Roles

### 6.2 Real-World Applications of AI

- Marketing
- Healthcare
- Finance
- Transportation
- Education
- Manufacturing
- Entertainment
- IT

### 6.3 Future of AI and Societal Impact

- Benefits and Challenges
- Environmental and Economic Impact
- Emerging Trends and Advancements

### 6.4 Consciousness and Ethical AI

- Human Consciousness
- Artificial Consciousness
- Technological Singularity

- Ethical Implications of Conscious AI