

Program outline

Bachelor of Science in Computer Science

Last updated in May 2025

Key notes

Program outline document:

- Is a reference for UAE universities. Universities can also submit their own outline as part of “New program approval” service.
- Is subject to future revisions to ensure alignment with emerging trends.
- will specify general education courses according to CAA guidelines, requirements of local authorities, and international accrediting bodies.

Overview:

Core Courses	66-87 Cr. Hr.
Electives	24-30 Cr. Hr.
Practical Experience & Projects	9-12 Cr. Hr.
Total	120-130 Cr. Hr.

I. Core Courses

Course	Credit Hours
Mathematics & Statistics	15-21
Discrete Mathematics	3-6
Calculus	3-6
Linear Algebra	3
Probability & Statistics	3
Computational Mathematics	3
Computer Science Core	36-51
Programming	6-9
Data Structures & Algorithms	3-6
Computer Organization & Architecture	3-6
Operating Systems	3
Networks & Security	6-9
Databases and Data Management	3-6
Software Engineering	3
Theory of Computation	3
Artificial Intelligence & Machine Learning	3
Human-Computer Interaction	3
Professional Practice	15
English Composition & Communication	6
Professional Ethics in Technology	3
Project Management	3
Entrepreneurship in Technology	3

II. Electives

Electives enable students to specialize in advanced topics, such as Data Science, Artificial Intelligence, Software Engineering, and Cybersecurity	24-30
Sample Courses & Concentrations	Credit Hours
General Electives	6-9
Blockchain and Cryptocurrency	3
Introduction to Quantum Computing	3
Computational Biology	3

Advanced Algorithms	3
Concentration 1: Artificial Intelligence & Machine Learning	
Deep Learning & Neural Networks	3
Advanced Machine Learning	3
Robotics and Computer Vision	3
Reinforcement Learning	3
AI in Cloud Computing	3
AI Ethics and Bias	3
Concentration 2: Cybersecurity	
Introduction to Cybersecurity	3
Cryptography and Network Security	3
Ethical Hacking and Penetration Testing	3
Digital Forensics	3
Cybersecurity Policy and Compliance	3
Concentration 3: Data Science and Analytics	
Statistical Data Analysis	3
Big Data Processing with Hadoop	3
Data Mining and Predictive Analytics	3-6
Advanced Visualization Techniques	3
Cloud Data Solutions	3
Concentration 4: Software Engineering	
Advanced Software Engineering	3
Agile Development and Scrum	3
Cloud Computing and Microservices	3
DevOps and Continuous Integration	3
Enterprise Software Solutions	3
Concentration 5: Computer Graphics and Animation	
Introduction to Computer Graphics	3
3D Modeling and Animation	3
Rendering Techniques	3
Game Design and Interactive Graphics	3
Advanced Animation and Visual Effects	3
Virtual Reality (VR) and Augmented Reality (AR)	3



Digital Image Processing	3
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III. Practical Experience & Projects

Suggested experience & projects	Credit Hours
Work placement: 16+ weeks industry work placement	3-6
Capstone Project: Final year, two-semester project	6