

CISmate ChatBot Knowledge Base

1. General Information About the Computer Information Systems (CIS) Major

1.1 Overview

The Bachelor of Science in Computer Information Systems (CIS) at the University of Jordan prepares students to design, analyze, build, and manage modern information systems that support the operations of organizations in both the public and private sectors. The program bridges computing technology with business processes, training students to become professionals who understand both the technical and organizational sides of information systems.

CIS focuses on enabling students to use technology to solve real-world problems, improve efficiency, support decision-making, and help organizations operate intelligently in a rapidly evolving digital environment.

1.2 Vision & Mission

Vision

To be a leading academic program that contributes to technological, economic, and social development through excellence in education, learning, and research in the field of Computer Information Systems.

Mission

To provide an outstanding educational environment that fosters creativity, innovation, and practical skills. The program equips students with the knowledge and competencies needed to design, develop, and manage information systems that serve organizations effectively across different sectors.

1.3 What Makes CIS Unique?

CIS stands at the intersection of technology and business, offering a balanced blend of:

Technical Foundations

- Programming and software development
- Database design and management
- Information security and networks
- Web and mobile systems
- Data analysis and cloud technologies

Business & Organizational Understanding

- Business process modeling
- Project management
- Systems planning and evaluation
- Understanding how information systems support organizational goals

1.4 Skills Students Gain

By completing the CIS program, students develop the ability to:

- Analyze problems and design efficient technological solutions
- Build and manage information systems across their full lifecycle
- Work with databases, SQL, and secure data management practices
- Develop software applications for web, mobile, and enterprise environments
- Communicate technical ideas to non-technical audiences
- Understand IT infrastructure, operations, and digital transformation
- Apply analytical thinking to decision-making and process improvement

1.5 Career Opportunities

Graduates of the CIS program can pursue roles such as:

- Software Developer / Programmer
- Database Administrator
- Systems Analyst
- IT Project Coordinator
- Business Analyst
- Full-Stack Web Developer
- Mobile App Developer
- Cybersecurity Analyst
- IT Support & Systems Technician
- Data Analyst (entry-level)

1.6 Accreditation & Program Quality

The CIS program at the University of Jordan is internationally accredited by ABET, ensuring that the curriculum meets high global standards and aligns with industry expectations. This accreditation reflects the program's dedication to quality, continuous improvement, and the preparation of graduates who are ready for both local and global job markets.

1.7 Why Study CIS at KASIT?

- Strong reputation as one of Jordan's leading IT schools
- Curriculum aligned with real industry needs
- Emphasis on hands-on learning, projects, and practical skills
- Courses covering both foundational computing and advanced modern topics
- Highly qualified faculty and up-to-date laboratories
- Excellent employment opportunities in the Jordanian and regional markets

2. Study Plan Structure (University of Jordan – B.Sc. in Computer Information Systems)

2.1 Program Duration

The Bachelor of Science in Computer Information Systems at the University of Jordan is structured as a four-year program, normally completed over eight semesters. The plan is flexible, allowing students to finish earlier or extend their study period depending on course load and academic performance.

2.2 Total Credit Hours

To graduate, students must successfully complete 132 credit hours, divided into four main categories:

1. University Requirements
2. Faculty (KASIT) Requirements
3. Major Requirements (Compulsory + Electives)
4. Free Electives

This distribution ensures a balanced education combining general knowledge, foundational computing, and specialized CIS content.

2.3 Detailed Credit Hour Distribution

1. University Requirements

These courses provide broad academic skills and foundational cultural knowledge required for all UJ students.

Typical breakdown:

- Compulsory University Requirements: ~27 credit hours
- Elective University Requirements: ~6 credit hours

2. Faculty (KASIT) Requirements

These are core IT and computing courses required for all students across KASIT majors. They provide essential computational, mathematical, and technical foundations.

- Total: ~24 credit hours

3. Major Requirements – Computer Information Systems

A. Major Compulsory Courses

These courses form the academic backbone of the CIS specialization. They cover areas such as programming, databases, systems analysis, networks, algorithms, cybersecurity, web development, cloud fundamentals, and IT infrastructure.

- Total: ~63 credit hours

B. Major Elective Courses

Students personalize their degree by choosing specialized topics such as:

- Mobile application development
- Advanced database systems
- Machine learning fundamentals
- Information security
- Enterprise systems
- Cloud computing
- Human-computer interaction

- Total: ~12 credit hours

4. Free Electives

Students may take 6 credit hours from any faculty at the University of Jordan, allowing them to explore areas outside computing and broaden their academic perspective.

2.4 Recommended Semester-by-Semester Progression

Year 1 – Foundations

- Introduction to programming
- Introduction to information systems
- Basic mathematics
- Communication skills
- University general requirements
- IT fundamentals

Year 2 – Core Knowledge

- Object-oriented programming
- Web technologies
- Databases I
- Discrete structures
- Probability & statistics
- Faculty requirement courses

Year 3 – Intermediate & Applied Topics

- Systems analysis and design
- Operating systems
- Databases II
- Computer networks
- IT infrastructure
- Major electives begin

Year 4 – Advanced Topics & Capstone

- Advanced CIS electives
- IT project management
- Graduation Project (Senior Project)

- Remaining major and free electives

2.5 Prerequisite & Academic Progression Rules

- Many CIS courses have strict prerequisite chains (e.g., Programming → OOP → Data Structures → Algorithms).
- Students must complete required lower-level courses before advancing.
- Some courses may be taken concurrently when designated as “corequisites”.
- The Graduation Project is restricted to final-year students who have completed essential CIS core courses.
- The study plan encourages taking faculty and university requirements early to reduce scheduling conflicts later.

2.6 Purpose of the Study Plan Structure

The structured progression ensures that students:

- Gain strong computing fundamentals early
- Acquire specialized CIS knowledge in upper-level courses
- Develop practical and project-based experience
- Prepare for careers in software development, database systems, IT management, and information systems analysis

3. CIS Course Catalog

This section provides an organized overview of the courses within the Computer Information Systems (CIS) program at the University of Jordan.

Compulsory courses include full details because they are the core of the program and commonly asked about.

Elective courses are written in a compact format to keep the catalog clean and efficient for retrieval.

3.1 College Requirements (Foundational Courses)

These courses form the shared technical foundation across KASIT majors.

- Introduction to Programming (1941102) – 3 credit hours

Summary: Foundations of problem solving, algorithms, data types, functions, and debugging.

- Fundamentals of Information Technology (1904101) – 3 credit hours

Summary: Overview of hardware, software, OS basics, networking, and cybersecurity.

- Discrete Mathematics (1901101) – 3 credit hours

Summary: Logic, sets, combinatorics, graph theory, and proof techniques.

- Data Structures (1901242) – 3 credit hours

Summary: Lists, trees, recursion, hashing, graphs, and complexity analysis.

- Database Management Systems (1902224) – 3 credit hours

Summary: SQL, ER modeling, normalization, transactions, indexing, and ACID.

- Web Applications Development (1904120) – 3 credit hours

Summary: Web front-end/back-end, REST APIs, authentication, deployment.

- Linear Algebra for Computational Sciences (1915101) – 3 credit hours

Summary: Matrices, linear systems, eigenvalues, and applications in ML and graphics.

3.2 Major Compulsory Courses (Full Detail)

These courses form the core of the CIS specialization.

Information Systems and Applications (1902225) – 3 credit hours

Summary: Business processes, enterprise systems, decision support, and how IT supports organizational goals.

Software Engineering (1902372) – 3 credit hours

Summary: SDLC, requirements, design, testing, documentation, agile, DevOps, project work.

Operating Systems (1901473) – 3 credit hours

Summary: Processes, threads, synchronization, memory management, file systems, virtualization.

Computer Networks (1901363) – 3 credit hours

Summary: TCP/IP stack, routing, switching, addressing, security fundamentals, configuration.

Advanced Java Programming (1902214) – 3 credit hours

Summary: Streams, lambdas, concurrency, networking, testing, I/O, modular application design.

Artificial Intelligence (1905320) – 3 credit hours

Summary: Search, knowledge representation, reasoning, ML basics, intelligent systems.

Systems Analysis and Design (1902474) – 3 credit hours

Summary: Requirements, UML/BPMN, system modeling, design, analysis, validation.

Advanced Software Engineering (1902472) – 3 credit hours

Summary: Architecture, microservices, scalability, refactoring, CI/CD, design patterns.

Human Computer Interaction (1902353) – 3 credit hours

Summary: UX principles, prototyping, accessibility, usability testing, interaction patterns.

Project Management (1902478) – 3 credit hours

Summary: Planning, scheduling, budgeting, risk, procurement, stakeholder management.

Employment Readiness I/II/III (1902490, 1902491, 1902492)

Summary: Professional skills, communication, teamwork, tooling, real-world project cycles.

Seminar – Road to Software Industry (1902390)

Summary: Career development, industry practices, portfolio building.

Health Information Management (1902226)

Summary: Health data governance, interoperability, coding standards, privacy and quality.

Health Informatics (1902325)

Summary: EHR systems, HL7/FHIR standards, data analytics for clinical decisions.

Health Information Security and Privacy (1902384)

Summary: Access control, encryption, auditing, compliance, legal/ethical frameworks.

Healthcare Database Administration (1902328)

Summary: High-availability databases, backup/recovery, interoperability, auditing.

Mobile Development Frameworks (1902310)

Summary: Cross-platform frameworks, UI/UX patterns, device APIs, state management.

Geographical Information Systems (1902459)

Summary: Spatial data, projections, GIS software, mapping, geoprocessing.

Digital Image Processing (1902454)

Summary: Image acquisition, filtering, segmentation, features, computer vision basics.

Emerging Trends & Technologies in Health Informatics (1902329)

Summary: Telehealth, IoMT, wearables, AI diagnostics, regulatory impacts.

3.3 Major Elective Courses (Compact Format)

- Web Server Programming (1904253) – 3 credits: Server-side frameworks, routing, APIs.
- Intelligent Information Systems (1902327) – 3 credits: AI-driven decision support.
- DevOps (1902382) – 3 credits: CI/CD, containers, monitoring.
- Game Development (1902481) – 3 credits: Engines, physics, prototyping.
- Multimedia (1902351) – 3 credits: Audio/video processing & interactive media.

- Computer Assisted Learning (1902355) – 3 credits: EdTech systems and design.
- Computer Graphics (1901359) – 3 credits: Rendering, shaders, transformations.
- Healthcare Cloud Computing (1902369) – 3 credits: Cloud, compliance, deployment.
- Machine Learning & Neural Networks (1915370) – 3 credits: ML training and evaluation.
- Database Technologies & Applications (1902324) – 3 credits: NoSQL, scaling, optimization.
- UI/UX Design (1902380) – 3 credits: Design systems, prototyping, accessibility.
- Business Process Re-engineering (1902381) – 3 credits: Process modeling & automation.
- Information & Knowledge Management (1902326) – 3 credits: Data organization & collaboration.
- Security of Web Applications (1911351) – 3 credits: OWASP, secure coding, testing.
- Internet of Things (1905430) – 3 credits: Embedded devices, sensors, connectivity.
- Virtual Reality (1905453) – 3 credits: Immersive systems, interaction, performance.
- e-Payment Systems (1904487) – 3 credits: Digital payments, wallets, integration.
- Digital Speech Processing (1905382) – 3 credits: Speech features, recognition, synthesis.
- IS Audit & Quality Assurance (1902479) – 3 credits: Controls, risk, compliance.
- Special Topics (1902494) – 3 credits: Advanced rotating subject.
- Data Mining (1905222) – 3 credits: Classification, clustering, evaluation.
- Advanced AI Programming (1905310) – 3 credits: Scalable ML/AI pipelines.
- Natural Language Processing (1905380) – 3 credits: NLP, text models, sequence labeling.

4. Faculty Members

The Computer Information Systems (CIS) Department at the University of Jordan has a group of academic and administrative staff who teach courses, supervise projects and training, conduct research, and support students throughout their studies.

This section provides structured information about CIS faculty and key contacts so that an academic assistant chatbot can answer questions about **who they are, what they do, and how to contact them**.

4.1 Overview of the CIS Department Faculty

Faculty members in the CIS Department include professors, associate professors, assistant professors, and lecturers/teachers. They are responsible for:

- Teaching undergraduate courses and labs.
- Supervising graduation projects and internships.
- Conducting research in different areas of Computer Information Systems.
- Providing academic advising and guidance to students.

The chatbot can use this information to explain faculty roles and to direct students to the right type of staff member for specific issues (such as a course question, a graduation project, or an administrative request).

4.2 Key Contacts in the CIS Department

This subsection lists the most important contact persons for CIS students: the **Head of Department** and the **Department Secretary**.

- **Head of the Computer Information Systems Department**
 - **Name:** Dr. Rana M. M. Yousef [KAIIST+1](#)
 - **Role:** Chairman (Head) of the Computer Information Systems Department.
 - **Official Email:** rana.yousef@ju.edu.jo [KAIIST](#)
 - **Phone (through the university switchboard):** +962 6 5355000, Extension 22610. [KAIIST](#)
- **CIS Department Secretary**
 - **Name:** Ms. Ayat Al-Ghazawi [KAIIST](#)

- **Role:** Secretary of the Computer Information Systems Department.
- **Official Email:** CIS@ju.edu.jo (listed as CIS[at]ju.edu.jo on the official website). [KAIIST+1](#)
- **Phone (through the university switchboard):** +962 6 5355000, Extension 22610. [KAIIST](#)

Common Questions about Key Contacts

- **Question:** Who is the head of the Computer Information Systems Department?
Answer: The head of the Computer Information Systems Department is **Dr. Rana M. M. Yousef**.
- **Question:** What is the email of the head of the CIS Department?
Answer: The official email of the head of the CIS Department, Dr. Rana M. M. Yousef, is rana.yousef@ju.edu.jo.
- **Question:** Who is the CIS Department secretary?
Answer: The CIS Department secretary is **Ms. Ayat Al-Ghazawi**.
- **Question:** What is the email of the CIS Department secretary?
Answer: The official email of the CIS Department secretary, Ms. Ayat Al-Ghazawi, is CIS@ju.edu.jo.

These explicit question–answer pairs are included so that a chatbot using retrieval-augmented generation can easily match student questions to accurate answers.

4.3 CIS Academic Staff (Names and Ranks)

This subsection lists the academic staff of the Computer Information Systems Department, grouped by rank. This allows the chatbot to answer questions such as “Who are the CIS professors?” or “Who are the assistant professors in CIS?”.

Note: Staff membership and ranks may change over time. The official source of truth is the CIS department page on the University of Jordan website.

Professors – Computer Information Systems

- **Dr. Moh'd Belal Al-Zoubi** – Professor, Computer Information Systems. [KAIIST](#)
- **Dr. Bassam Hasan Hammo** – Professor, Computer Information Systems. [KAIIST](#)
- **Dr. Amjad Hudaib** – Professor, Computer Information Systems. [KAIIST](#)
- **Dr. Thair Hamtini** – Professor, Computer Information Systems. [KAIIST](#)

- **Dr. Rana M. M. Yousef** – Professor, Computer Information Systems (also Head of the CIS Department). [KAIIST+1](#)

Associate Professors – Computer Information Systems

- **Dr. Mousa Tawfiq Al-Akhras** – Associate Professor, Computer Information Systems. [KAIIST](#)
- **Dr. Mohammad Abushariah** – Associate Professor, Computer Information Systems. [KAIIST](#)
- **Dr. Marwan Al-Tawil** – Associate Professor, Computer Information Systems. [KAIIST](#)
- **Dr. Huda Karajeh** – Associate Professor, Computer Information Systems. [KAIIST](#)
- **Dr. Hamad Iqab Alsawalqah** – Associate Professor, Computer Information Systems. [KAIIST](#)
- **Dr. Salsabeel Fayiz Alfalah** – Associate Professor, Computer Information Systems. [KAIIST](#)
- **Dr. Esra Alzaghouli** – Associate Professor, Computer Information Systems. [KAIIST](#)

Assistant Professors – Computer Information Systems

- **Dr. Reem Al Fayed** – Assistant Professor, Computer Information Systems. [KAIIST](#)
- **Dr. Abdelbaset Jamal Assaf** – Assistant Professor, Computer Information Systems. [KAIIST](#)

Teachers / Lecturers – Computer Information Systems

- **Aseel Al-Anani** – Teacher, Computer Information Systems. [KAIIST](#)
- **Rola Ismail Al-Khaled** – Teacher, Computer Information Systems. [KAIIST](#)
- **Dr. Tahani Salah Al-Khatib** – Teacher, Computer Information Systems. [KAIIST](#)
- **Lama Rajab Abdel-Majeed** – Teacher, Computer Information Systems. [KAIIST](#)
- **Hiba Ali Mohammad** – Teacher, Computer Information Systems. [KAIIST](#)
- **Tamara Al-marabeh** – Teacher, Computer Information Systems. [KAIIST](#)
- **Wala'a Qutechate** – Teacher, Computer Information Systems. [KAIIST](#)
- **Yousef Majdalawi** – Teacher, Computer Information Systems. [KAIIST](#)

Example Questions the Chatbot Can Answer Using This List

- **Question:** Who are the professors in the CIS Department at the University of Jordan?
Answer: The professors in the CIS Department include Dr. Moh'd Belal Al-Zoubi, Dr. Bassam Hasan Hammo, Dr. Amjad Hudaib, Dr. Thair Hamtini, and Dr. Rana M. M. Yousef.
 - **Question:** Who are the associate professors in CIS?
Answer: The associate professors in CIS include Dr. Mousa Tawfiq Al-Akhras, Dr. Mohammad Abushariah, Dr. Marwan Al-Tawil, Dr. Huda Karajeh, Dr. Hamad Iqab Alsawalqah, Dr. Salsabeel Fayiz Alfalah, and Dr. Esra Alzaghouli.
 - **Question:** Who are the assistant professors in CIS?
Answer: The assistant professors in CIS include Dr. Reem Al Fayez and Dr. Abdelbaset Jamal Assaf.
 - **Question:** Who are the CIS teachers (lecturers)?
Answer: CIS teachers include Aseel Al-Anani, Rola Ismail Al-Khaled, Dr. Tahani Salah Al-Khatib, Lama Rajab Abdel-Majeed, Hiba Ali Mohammad, Tamara Al-marabeh, Wala'a Qutechate, and Yousef Majdalawi.
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4.4 How to Contact CIS Faculty and Staff

Students are expected to communicate with faculty and staff in a **formal and respectful** way.

- **Official Email**
 - All CIS faculty and staff have an official University of Jordan email address, typically ending with @ju.edu.jo.
 - When sending an email, students should include:
 - Full name.
 - University ID.
 - Course name and section (if relevant).
 - A clear, short subject line.
 - Example:
 - "Subject: Question about CIS Database 1 – Section 2"
- **Office Hours**

- Instructors usually announce their office hours at the beginning of each semester.
- During office hours, students can visit to ask about lectures, assignments, exams, or general academic advice.
- **E-Learning and Online Platforms**
 - Some instructors use e-learning platforms (such as Moodle or Microsoft Teams) to post announcements, assignments, and exam information.
 - Students should check these platforms regularly and follow each instructor's preferred communication method.

Example Questions the Chatbot Can Answer

- **Question:** How should I contact a CIS instructor?
Answer: You should contact your CIS instructor using their official university email, write a clear subject line, include your full name, university ID, and course information, and use polite and formal language.
 - **Question:** How can I contact the CIS Department secretary?
Answer: You can contact the CIS Department secretary, Ms. Ayat Al-Ghazawi, by email at **CIS@ju.edu.jo** or by phone through the university switchboard at +962 6 5355000, Extension 22610.
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4.5 How the Chatbot Uses Faculty Information

The information in this section is written so that an academic assistant chatbot can:

- Identify **who** holds key roles (such as the Head of Department and the CIS secretary).
- List **CIS academic staff by rank** (professor, associate professor, assistant professor, teacher).
- Answer questions about **who teaches in the CIS Department**.
- Provide **contact information** for key administrative contacts.
- Explain how students should **properly communicate** with faculty and staff.

5. Frequently Asked Questions (FAQ)

Below are the most common questions asked by CIS students at the University of Jordan. Answers are concise, accurate, and retrieval-friendly.

5.1 General Department Questions

Q: Where is the CIS Department located?

A: In the King Abdullah II School for Information Technology (KASIT) building.

Q: Who is the Head of the CIS Department?

A: Dr. Rana M. M. Yousef.

Q: Who is the CIS Department secretary?

A: Ms. Ayat Al-Ghazawi.

Q: What is the secretary's email?

A: CIS@ju.edu.jo.

Q: How do I contact CIS instructors?

A: Email them using your official name, student ID, course/section, and a clear subject line.

Q: Do instructors have office hours?

A: Yes. They are announced at the beginning of the semester.

5.2 Courses, Registration & Prerequisites

Q: How many credit hours are required to graduate?

A: 132 credit hours.

Q: Can I register for a course without completing its prerequisite?

A: No. CIS courses follow strict prerequisite chains.

Q: What happens if I fail a prerequisite course?

A: You must retake and pass it before taking any dependent course.

Q: Can I take a lab without its corresponding lecture?

A: No, unless the department explicitly allows it.

Q: Can I take more than 18 credit hours in a semester?

A: Only if your GPA meets the overload rules and you receive approval.

Q: Can I take electives from other IT majors?

A: Yes, if prerequisites are met and they are allowed by the department.

Q: Can I finish my degree earlier than 4 years?

A: Yes. With summer semesters or heavier course loads.

5.3 Programming & Study Plan Progression

Q: What is the programming course order?

A:

1. Introduction to Programming
2. Object-Oriented Programming
3. Data Structures
4. Advanced programming / Software Engineering courses

Q: When should I take Operating Systems and Networks?

A: Usually in Year 3 after Data Structures and core programming.

Q: Is it recommended to take OS, Networks, and Database II together?

A: No. This combination is heavy unless required.

Q: Which courses should I take in my first year?

A: University requirements, IT fundamentals, and introductory programming/math.

5.4 Graduation Project (Project 1 & 2)

Q: What is the difference between Graduation Project 1 and 2?

A:

- **Project 1:** Topic selection, proposal, analysis, diagrams, system design, initial prototype.
- **Project 2:** Full implementation, testing, final documentation, and project defense.

Q: Can I take Graduation Project 1 alone?

A: Yes, but you must get approval from the person responsible for enrollment.

Q: Can I take the Graduation Project early?

A: No. It is restricted to final-year students who have completed core CIS courses.

Q: How many students are usually in a project team?

A: Typically 2–3 students. Solo teams need approval.

Q: Who assigns the Graduation Project supervisor?

A: Students usually choose a supervisor, but the department must approve it.

Q: Can I change my project topic?

A: Yes, if approved by your supervisor and done within the allowed timeframe.

5.5 Internship Requirements

Q: How many internship hours are required?

A: Typically 90 hours.

Q: Do I need to finish the internship before Project 2?

A: Yes. The internship must be completed before or within the period leading to the Exit Semester.

Q: Can I do my training early?

A: Yes, but completing core programming and DB courses first is recommended.

Q: What documents are needed for the internship?

A: Acceptance letter, training evaluation, and a final report.

Q: Where can I complete the internship?

A: IT companies, banks, telecom firms, software houses, government institutions, or approved entities.

5.6 Exit Semester Requirements

Q: What is the Exit Semester?

A: The final semester before graduation where all capstone requirements are completed.

Q: What must I take in the Exit Semester?

A:

1. Graduation Project 2
2. Training Course (linked to the 90-hour internship)
3. Employment Readiness III

All **three must be taken together** in the same semester.

Q: Can I take Project 2 without the Training or Employment Readiness?

A: No. These three components are linked and must be taken together.

Q: What if I already completed my 90 internship hours earlier?

A: You must still **register** for the Training Course during the Exit Semester.

Q: Can I have university/free electives in the Exit Semester?

A: Yes. As long as the capstone components are in the same term.

5.7 Academic Policies

Q: What is the attendance policy?

A: Exceeding the allowed absence limit may result in automatic denial of the course.

Q: What happens if I miss an exam?

A: Only students with valid, official excuses are allowed a makeup exam.

Q: How is grading usually structured?

A: Depends on the instructor; the final exam typically carries the highest weight.

Q: What is an incomplete grade (I)?

A: Given when a student's performance was satisfactory but unfinished due to a valid reason.

Q: Can I withdraw from a course?

A: Yes. A "W" will appear on your transcript but does not impact GPA.

5.8 Department Procedures & Communication

Q: How fast do instructors usually reply to emails?

A: Within 24–48 hours on working days.

Q: Can I visit instructors outside office hours?

A: Only by prior arrangement.

Q: Where are announcements and assignments posted?

A: Usually on Moodle or Microsoft Teams.

Q: What if two required courses overlap in schedule?

A: Contact the department. They may open new sections or offer alternatives.

Q: How long does graduation processing take?

A: Several weeks after completing all requirements.

5.9 Electives, Tracks & Study Advice

Q: Which electives are good for software development?

A: DevOps, Advanced Software Engineering, Web Server Programming, UI/UX.

Q: Which electives are good for AI/ML?

A: Machine Learning, NLP, Data Mining, Intelligent Information Systems.

Q: How many electives should I take in my final year?

A: Usually 3–4 electives.

5.10 Student-Life FAQs

Q: Is the CIS major difficult?

A: It can be challenging, but consistent practice makes it manageable.

Q: What laptop specs are recommended?

A: 8–16 GB RAM, SSD, and a modern CPU.

Q: Are summer semesters easier?

A: Not necessarily; they are shorter and more intensive.

Q: Can I change my major?

A: Yes, if you meet the university transfer requirements.

Q: Do free electives affect GPA?

A: Yes. All graded courses count toward your GPA.

Got you Abdulrahman — here is the **clean, perfectly formatted “Prerequisite Chain Map” section** written **exactly for your chatbot PDF**, with clean headings and bullet points, **no technical chunking**, ready to paste directly inside your document.

No JSON, no code — just a polished academic section.



Prerequisite Chain Map (CIS Department – Official Structure)

The following section presents a **complete, accurate prerequisite map** for all CIS courses. It is organized by category to help students understand course dependencies, progression paths, and recommended sequencing throughout the degree.

● 1. Core Programming & Software Development

- **Introduction to Programming (1941102)**

Prerequisite: None

- **Object Oriented Programming (1902110)**

Prerequisite: Introduction to Programming (1941102)

- **Data Structures (1901242)**

Prerequisite: Object Oriented Programming (1902110)

- **Advanced Java Programming (1902214)**

Prerequisite: Object Oriented Programming (1902110)

- **Software Engineering (1902372)**

Prerequisite: Database Management Systems (1902224)

- **Advanced Software Engineering (1902472)**

Prerequisite: Software Engineering (1902372)

- **Systems Analysis and Design (1902474)**

Prerequisite: Software Engineering (1902372)

- **2. Database & Data-Driven Courses**

- **Database Management Systems (1902224)**

Prerequisite: Data Structures (1901242)

- **Database Technologies and Applications (1902324)**

Prerequisite: Database Management Systems (1902224)

- **Healthcare Database Administration (1902328)**

Prerequisites:

- Health Information Management (1902226)
- Database Management Systems (1902224)

- **Data Mining (1905222)**

Prerequisites:

- Database Management Systems (1902224)
- Linear Algebra (1915101)

- **Intelligent Information Systems (1902327)**

Prerequisites:

- Information Systems and Applications (1902225)
- Artificial Intelligence (1905320)

3. Web, Front-End & Back-End Development

- **Web Applications Development (1904120)**

Prerequisite: Introduction to Programming (1941102)

- **Web Server Programming (1904253)**

Prerequisite: Web Applications Development (1904120)

- **User Interface and UX Design (1902380)**

Prerequisite: Human Computer Interaction (1902353)

- **Multimedia (1902351)**

Prerequisites:

- Data Structures (1901242)
 - Linear Algebra (1915101)
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4. Networks, Security & Infrastructure

- **Computer Networks (1901363)**

Prerequisite: None

- **Operating Systems (1901473)**

Prerequisite: Data Structures (1901242)

- **Security of Web Applications (1911351)**

Prerequisites:

- Database Management Systems (1902224)
- Web Applications Development (1904120)

- **Health Information Security & Privacy (1902384)**

Prerequisite: Health Information Management (1902226)

5. Health Informatics

- **Health Information Management (1902226)**

Prerequisite: Information Systems and Applications (1902225)

- **Health Informatics (1902325)**

Prerequisites:

- Health Information Management (1902226)
- Principles of Statistics (0301131)

- **Emerging Trends in Health Informatics (1902329)**

Prerequisite: Health Information Management (1902226)

- **Healthcare Cloud Computing (1902369)**

Prerequisites:

- Health Information Management (1902226)
 - Computer Networks (1901363)
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- **6. Artificial Intelligence & Data Science**

- **Artificial Intelligence (1905320)**

Prerequisite: Data Structures (1901242)

- **Machine Learning & Neural Networks (1915370)**

Prerequisite: Theory of Algorithms (1901341)

- **Natural Language Processing (1905380)**

Prerequisite: Artificial Intelligence (1905320)

- **Advanced AI Programming (1905310)**

Prerequisite: Advanced Java Programming (1902214)

- **7. Mobile, Multimedia, Graphics & Electives**

- **Mobile Development Frameworks (1902310)**

Prerequisites:

- Web Applications Development (1904120)
- Advanced Java Programming (1902214)

- **Game Development (1902481)**

Prerequisite: Advanced Java Programming (1902214)

- **Digital Image Processing (1902454)**

Prerequisite: Advanced Java Programming (1902214)

- **Computer Graphics (1901359)**

Prerequisite: Data Structures (1901242)

- **Digital Speech Processing (1905382)**

Prerequisite: Artificial Intelligence (1905320)

8. Information Systems & Business Courses

- **Information Systems and Applications (1902225)**

Prerequisite: Fundamentals of IT (1904101)

- **Business Process Re-engineering (1902381)**

Prerequisite: Information Systems and Applications (1902225)

- **Information & Knowledge Management (1902326)**

Prerequisite: Information Systems and Applications (1902225)

- **Certified Software (1902458)**

Prerequisite: Advanced Java Programming (1902214)

- **IT Entrepreneurship & Innovation (1902383)**

Prerequisite: Database Management Systems (1902224)

- **e-Payment Systems (1904487)**

Prerequisite: Health Information Security & Privacy (1902384)

9. GIS & Spatial Systems

- **Geographical Information Systems (1902459)**

Prerequisites:

- Advanced Java Programming (1902214)
 - Information Systems and Applications (1902225)
-

10. Professional Development & Exit Semester

- **Employment Readiness 1 (1902490)**

Prerequisite: None

- **Employment Readiness 2 (1902491)**

Prerequisite: Employment Readiness 1 (1902490)

- **Employment Readiness 3 (1902492)**

Prerequisite: Employment Readiness 2 (1902491)

- **Internship & Professional Certification (1902493)**

Prerequisite: Employment Readiness 2 (1902491)

11. Seminars & Miscellaneous

- **Seminar – Road to Software Industry (1902390)**

Prerequisite: None

- **Special Topics (1902494)**

Prerequisite: Information Systems and Applications (1902225)

- **Computer Ethics and Documentation (1902203)**

Prerequisite: None

Great — here is **Section 7: Graduation Project**, written in the *exact same tone, structure, and style* as the rest of your chatbot PDF.

Fully **vector-friendly, clean, non-technical**, and ready to paste directly into your document.

7. Graduation Project (Project 1 & Project 2)

The Graduation Project is the capstone requirement of the CIS program. It is completed over **two consecutive courses**—Project 1 and Project 2—and represents the student's final demonstration of technical, analytical, and professional skills.

This section explains the purpose, structure, requirements, rules, and common questions related to the Graduation Project so that the chatbot can guide students accurately.

7.1 Purpose of the Graduation Project

The Graduation Project is designed to help students:

- Apply concepts learned throughout the CIS curriculum
- Work on real-world problems and produce practical solutions
- Demonstrate skills in analysis, design, development, and documentation
- Collaborate effectively as a team
- Prepare for industry expectations and professional roles

It serves as the final academic milestone before entering the job market.

7.2 Structure of the Graduation Project

Project 1 (Proposal & Design Phase)

In this phase, students focus on planning and designing their system. Typical activities include:

- Selecting a suitable project topic
- Conducting background research
- Identifying the problem and objectives
- Writing the project proposal
- Performing requirements analysis
- Creating diagrams (UML, ERD, system architecture)
- Designing the initial prototype or interface concepts

Project 1 focuses on *thinking, planning, and designing* rather than full implementation.

Project 2 (Implementation & Delivery Phase)

This phase builds directly on Project 1. Students complete the full system and prepare it for evaluation.

Activities include:

- Complete system implementation
- Testing (unit, integration, system testing)
- Finalizing documentation
- Preparing the project presentation
- Demonstrating the system in a formal evaluation session

Project 2 focuses on *building, refining, and presenting* the final system.

7.3 Enrollment Requirements

To enroll in the Graduation Project, students must meet the following conditions:

- Be in the **final academic year**
- Have completed key CIS core courses (programming, databases, systems analysis, etc.)
- Have completed or be completing the required elective and major courses
- Project 1 must be taken **before** Project 2
- Project 2 **cannot** be taken alone without the Exit Semester components (Training Course + Employment Readiness III)

The department may have semester-specific instructions that must also be followed.

7.4 Project Topic Selection

Students may propose topics from areas such as:

- Software systems

- Web and mobile applications
- Data-driven and analytic systems
- Information systems for organizations
- Cloud-based or integrated solutions
- Specialized domains such as health informatics or AI

A good topic should be:

- Feasible within one semester of work per phase
 - Technically aligned with CIS coursework
 - Clearly beneficial or problem-solving in nature
 - Approved by the supervisor and department
-

7.5 Supervisor Role

Each team is assigned or allowed to choose a faculty supervisor. Supervisors:

- Guide students in planning and implementation
- Approve project proposals
- Monitor progress through weekly or scheduled meetings
- Provide feedback on documentation and design
- Evaluate performance across both phases

Students are expected to maintain regular communication and meet deadlines set by the supervisor.

7.6 Group Size

The typical group size is:

- **2–3 students per team**

Solo projects are allowed only in exceptional cases and require special approval.

7.7 Documentation Requirements

Both Project 1 and Project 2 require formal documentation, which usually includes:

Project 1 Documentation

- Proposal
- Problem statement
- Requirements specification
- UML diagrams
- Initial design
- Preliminary prototype

Project 2 Documentation

- Updated requirements & diagrams
- Full design and implementation details
- Testing results
- User manual
- Final project report

Documentation must be clear, accurate, and follow department guidelines.

7.8 Evaluation & Grading

Evaluation typically includes:

- Supervisor assessment
- Committee presentation
- Quality of documentation
- System functionality
- Innovation and effort
- Team collaboration

The final defense in Project 2 is a major component of the grade.

7.9 Common Chatbot Questions (FAQ)

Q: What is the difference between Project 1 and Project 2?

A:

- Project 1 focuses on proposal, analysis, and design.
 - Project 2 focuses on implementation, testing, and final defense.
-

Q: Can I take Project 2 without finishing Project 1?

A: No. Project 1 is a mandatory prerequisite.

Q: Can I take the Graduation Project early?

A: No. It is restricted to final-year students who have completed essential CIS courses.

Q: Who assigns the project supervisor?

A: Students typically choose their supervisor, but final approval comes from the department.

Q: Can I change my project topic?

A: Yes, but only with approval and within the allowed timeframe.

Q: How long does the project take?

A: One full academic year (one semester for each phase).

Here you go Abdulrahman — **the full, clean, updated Section 8** with the corrected rule that the Training Course is part of the Exit Semester and **cannot** be taken alone.

Paste this directly into your chatbot PDF.

8. Internship Requirements (Training Course - 90 Hours)

The internship is a mandatory component of the CIS degree at the University of Jordan. It provides students with real-world experience in professional IT environments and prepares them for the job market.

This section explains the purpose, rules, documents, timeline, and common questions related to the internship so the chatbot can guide students accurately.

8.1 Purpose of the Internship

The internship aims to:

- Expose students to real IT work environments
- Strengthen technical and professional skills
- Provide practical experience that complements academic learning
- Develop communication, teamwork, and problem-solving abilities
- Help students understand industry expectations
- Build a foundation for future employment

It is an essential step toward transitioning from academic study to industry.

8.2 Required Training Hours

CIS students must complete:

✓ 90 hours of practical training

These hours must be completed at an **approved organization** that offers IT-related work.

Common internship locations include:

- Software companies
- Banks and financial institutions
- Telecom companies
- Government IT departments
- Tech startups
- IT service providers

- Cybersecurity, database, or cloud teams

Any training site must be approved by the department before starting.

8.3 When Can Students Start the Internship?

Students may begin the actual 90 training hours anytime **after completing core CIS courses**, such as:

- Programming fundamentals
- Object-oriented programming
- Data structures
- Databases
- Web development

However:

- Training hours may be completed early
 - **But the Training Course itself is taken ONLY in the Exit Semester**
-

8.4 Training Course (Part of the Exit Semester – Cannot Be Taken Alone)

The Training Course is an academic requirement linked tightly to the Exit Semester.

It **cannot** be taken by itself.

During the Exit Semester, students must register for the following three courses **together as a mandatory package**:

1. **Graduation Project 2**
2. **Training Course (Internship)**
3. **Employment Readiness III**

Even if a student completed the 90 training hours earlier:

- The Training Course still **must** be taken in the Exit Semester
- It cannot be taken alone or in a different semester

This rule ensures that all capstone requirements are completed in one coordinated period.

8.5 Required Documents

Students must submit the following:

1. Acceptance Letter

A formal letter from the company confirming the student's training placement.

2. Training Evaluation Form

Completed by the company at the end of the training, assessing the student's performance.

3. Final Training Report

Prepared by the student, describing:

- Training tasks and responsibilities
- Skills learned
- Technologies used
- Hours completed
- Reflections on the experience

The department may provide a template or specific guidelines.

8.6 Responsibilities During Training

Students are expected to:

- Attend regularly and follow professional conduct
- Obey company rules and working hours
- Complete tasks responsibly
- Demonstrate teamwork, punctuality, and communication skills
- Keep a record of training hours if required
- Notify the department of any issues

8.7 Evaluation

Training evaluation typically considers:

- Company's performance evaluation
- Quality of the final training report
- Completion of all required documents
- Confirmation of 90 training hours
- Supervisor's assessment

Failure to complete any requirement may delay graduation.

8.8 Common Chatbot Questions (FAQ)

Q: How many internship hours do I need?

A: You must complete 90 hours of practical training.

Q: When do I take the Training Course?

A: Only in the Exit Semester, together with Project 2 and Employment Readiness III.

Q: Can I take the Training Course alone?

A: No. It cannot be taken by itself and is part of a required 3-course package.

Q: What if I already completed my 90 hours earlier?

A: You still register for the Training Course during the Exit Semester.

Q: Can I train at any company?

A: The company must be IT-related and approved by the department.

Q: What documents are required?

A: Acceptance letter, evaluation form, and final report.

Q: Can I do my internship outside Jordan?

A: Yes, if the organization is approved and meets the requirements.

9. Academic Policies

Academic policies in the CIS program ensure fairness, consistency, and smooth academic progress for all students.

This section summarizes the most important rules related to attendance, exams, grading, withdrawal, communication, and academic integrity so the chatbot can provide clear and accurate answers.

9.1 Attendance Policy

- Students must attend lectures and labs regularly.
- Exceeding the university's absence limit results in **automatic denial (DN)** for the course.
- Excused absences require official documentation (medical report, official letter, etc.).
- Instructors may track attendance through systems or manual records.

Common chatbot questions:

Q: What happens if I exceed the absence limit?

A: You receive a DN and cannot complete the course.

9.2 Exam Policies

- Missing a midterm or final exam requires a **valid official excuse** approved by the department.
- Make-up exams are offered only after approval.
- Cheating or misconduct during exams results in disciplinary action according to university regulations.
- Instructors must announce exam dates in advance and follow the academic calendar.

Common chatbot questions:

Q: Can I get a make-up exam if I miss the final?

A: Only with an approved official excuse.

9.3 Grading Policies

- Final grades follow the University of Jordan grading scale.
- The final exam typically has the highest weight in the course grade.
- Continuous assessment (assignments, quizzes, labs, projects) varies by instructor.
- Grade appeals must follow the university's official process and timeline.

Common chatbot questions:

Q: How is my final grade calculated?

A: It depends on the instructor's distribution, but the final exam usually carries the most weight.

9.4 Course Withdrawal (W)

- Students may withdraw from a course within the official withdrawal period.
- A "W" appears on the transcript but **does not affect GPA**.
- Courses may not be withdrawn from after the deadline unless special approval is granted.

Common chatbot questions:

Q: Does a W affect my GPA?

A: No, it does not.

9.5 Incomplete Grade (I)

- Given only when the student's performance was satisfactory but incomplete due to a **valid reason**.
- Students must complete the remaining work within the allowed period set by the university.
- If not completed, the "I" may convert to a failing grade.

Common chatbot questions:

Q: When can I receive an incomplete grade?

A: Only when you have a valid excuse and have completed most course requirements.

9.6 Academic Integrity

- Plagiarism, cheating, copying assignments, or unauthorized collaboration violate university rules.
- Disciplinary measures may include failing the course, academic probation, or further penalties.
- Students must follow ethical and professional standards in all academic work.

9.7 Communication & Conduct

- Students must use formal, respectful language when contacting instructors or staff.
- Emails should include:
 - Full name

- University ID
 - Course name and section
 - Clear subject line
 - Students should check Moodle/Teams regularly for announcements.
 - Instructors typically respond within 24–48 hours on working days.
-

9.8 Course Load & Overload Policies

- Standard load is around 15–18 credit hours per semester.
 - Overload (more than 18 hours) requires GPA-based approval.
 - Students on academic probation have restrictions on maximum allowed credit hours.
-

9.9 Graduation Requirements

- Completion of all 132 credit hours.
 - Completion of Graduation Project 1 and 2.
 - Completion of 90-hour internship and Exit Semester components.
 - Clearing all university financial and administrative obligations.
-

10. Advising Tips & Recommended Academic Paths

This section provides practical advising guidelines for CIS students at the University of Jordan.

It helps students plan their semesters, choose suitable course combinations, and avoid common mistakes in the study plan.

10.1 General Academic Advice

- Follow the official CIS study plan as closely as possible.
- Complete core programming and mathematics courses early.
- Do not delay key CIS core courses such as Programming, OOP, Data Structures, and Database 1.
- Balance difficult technical courses with lighter university or faculty requirements.
- Use summer semesters only if you can handle fast-paced courses.
- Always check prerequisites before registering each semester.

- Monitor your GPA and avoid academic probation to keep course load flexibility.

Common questions this section can answer:

- “How should I plan my CIS semesters?”
 - “Which courses are priorities?”
 - “What mistakes should I avoid in my schedule?”
-

10.2 Recommended Course Load per Semester

- Typical load in regular semesters: **15–18 credit hours**.
- Typical load in summer semesters: **6–9 credit hours**, depending on course difficulty.

Good practice:

- Combine **1–2 difficult courses** with **easier or theoretical courses**.
- Avoid a semester full of programming-heavy and project-based courses.

Examples of **high-difficulty** or heavy courses:

- Data Structures
 - Algorithms
 - Operating Systems
 - Computer Networks
 - Database 2
 - Advanced Java Programming
 - Data Mining / AI electives
 - Graduation Project 2
-

10.3 Courses to Take Early (High Priority)

The following courses unlock many advanced subjects and should be taken as early as possible:

- Introduction to Programming

- Object Oriented Programming
- Data Structures
- Database Management Systems (DB1)
- Web Applications Development

Finishing these early allows students to register for:

- Software Engineering
 - Systems Analysis and Design
 - Operating Systems
 - Computer Networks
 - Advanced Java Programming
 - Many CIS electives (web, AI, cloud, security, mobile, etc.)
-

10.4 Heavy Course Combinations to Avoid

Students are advised **not** to take the following combinations in the same semester unless absolutely necessary:

- Operating Systems + Computer Networks + Database 2
- Advanced Java Programming + Operating Systems + Systems Analysis and Design
- Data Mining + Artificial Intelligence + Theory of Algorithms
- Multiple programming-intensive electives in a single semester

Reason:

These courses require significant time for projects, labs, assignments, and exam preparation, which increases stress and risk of low grades.

10.5 Recommended Progression by Year

Year 1 – Foundations

- Introduction to Programming
- Fundamentals of Information Technology

- Discrete Mathematics and other math foundations
- University compulsory and elective requirements

Goal: build general academic skills and basic programming ability.

Year 2 – Core Technical Skills

- Object Oriented Programming
- Data Structures
- Web Applications Development
- Database Management Systems (DB1)
- Probability and Statistics
- Remaining faculty (KASIT) requirements

Goal: complete the core programming and data courses needed for advanced CIS subjects.

Year 3 – Intermediate and Applied Topics

- Operating Systems
- Computer Networks
- Software Engineering
- Systems Analysis and Design
- Database 2 or another core CIS course
- Start taking major electives related to your target career path

Goal: develop strong system-level knowledge and project experience.

Year 4 – Specialization and Capstone

- Advanced CIS electives (AI, web, mobile, cloud, security, business IS)
- Graduation Project 1 and 2
- Training Course (internship)

- Employment Readiness courses

Goal: finalize degree requirements and prepare for employment or postgraduate study.

10.6 Elective Recommendations by Career Path

Software Development / Full-Stack

- Advanced Software Engineering
- Web Server Programming
- DevOps
- UI/UX Design
- Mobile Development Frameworks

Artificial Intelligence / Data Science

- Machine Learning and Neural Networks
- Natural Language Processing
- Data Mining
- Intelligent Information Systems
- Advanced AI Programming

Cybersecurity and Infrastructure

- Security of Web Applications
- Health Information Security and Privacy
- Computer Networks (core)
- Healthcare Cloud Computing

Business / Systems Analysis

- Business Process Re-engineering
- Information and Knowledge Management
- Intelligent Information Systems

These suggestions help students choose electives that match their preferred career direction.

10.7 Exit Semester Planning

The Exit Semester is the final semester where capstone requirements are completed.

The following three components must be taken together as a package:

1. Graduation Project 2
2. Training Course (linked to the 90-hour internship)
3. Employment Readiness III

Key advising points:

- Do not leave many difficult technical courses to the same semester as Graduation Project 2.
 - It is recommended to finish most electives and core CIS courses **before** the Exit Semester.
 - The 90 training hours can be completed earlier, but the Training Course itself is registered only in the Exit Semester.
-

10.8 Common Advising Mistakes to Avoid

- Delaying Introduction to Programming or OOP.
 - Delaying Data Structures, DB1, or Web Development to late semesters.
 - Registering several heavy technical courses in the same semester.
 - Taking Graduation Project 1 without having sufficient technical background.
 - Waiting too long to search for an internship placement.
 - Ignoring department announcements on Moodle or Microsoft Teams.
-

10.9 Quick FAQ for Advising

Q: Which courses should I prioritize at the beginning of the program?

A: Prioritize Programming, Math, Fundamentals of IT, and other core KASIT requirements.

Q: Which courses unlock the largest number of advanced topics?

A: Object Oriented Programming, Data Structures, Database 1, and Web Development.

Q: Is it safe to take Operating Systems, Networks, and Database 2 together?

A: It is not recommended except in special cases, because all three are heavy technical courses.

Q: When should I take Graduation Project 1?

A: Usually near the end of Year 3 or at the beginning of Year 4, after completing most core CIS subjects.

Q: How do I choose electives that fit my career goals?

A: Select electives based on your target area: software development, AI/data, security, cloud, or business IS, using the lists provided in Section 10.6.

11. Glossary of CIS & IT Terms (Final Version)

This glossary defines key technical, academic, and career-related terms used in the CIS program and the IT industry.

11.1 Academic & University Terms

Academic Advisor

A faculty member who guides students on course selection and graduation planning.

Attendance (DN)

If a student exceeds the allowed absence limit, they receive a DN and fail the course.

Corequisite

A course that must be taken at the same time as another course.

Credit Hours

The weight or size of a course, typically 3 credit hours.

Elective Course

A course chosen by the student from a list of options.

Exit Semester

The final semester including Project 2, Training Course, and Employment Readiness III.

GPA (Grade Point Average)

A numeric measure of academic performance.

Incomplete Grade (I)

Temporary grade given when the student has a valid excuse to finish remaining work later.

Prerequisite

A course that must be passed before taking a more advanced course.

Study Plan

The structured list of all courses required for graduation.

Transcript

Official document listing all courses taken and grades received.

11.2 Programming & Software Terms

Algorithm

Step-by-step procedure for solving a problem.

API (Application Programming Interface)

Allows one software system to communicate with another.

Array

A data structure that stores a list of items in order.

Back-End

Server-side logic, databases, authentication, and system operations.

Code Refactoring

Improving code structure without changing functionality.

Compiler

Translates code into machine-readable instructions.

Framework

A reusable platform for building software (e.g., Spring Boot, Flutter).

Front-End

User interface and visual components of applications.

IDE (Integrated Development Environment)

Software used for writing and debugging code (IntelliJ, VS Code).

Object-Oriented Programming (OOP)

Programming model based on objects, classes, and inheritance.

Software Development Lifecycle (SDLC)

Stages of building software: requirements → design → coding → testing → deployment.

Version Control (Git)

Tracks changes to code over time.

11.3 Databases, Data, & Analytics

Database Management System (DBMS)

Software for storing and managing data (MySQL, PostgreSQL).

Data Structures

Ways of organizing data (lists, trees, graphs, hashing).

Data Warehouse

Central system for storing structured data for analytics.

Data Pipeline

Series of steps that move and process data from source to destination.

ETL (Extract, Transform, Load)

Process of preparing and loading data into a warehouse.

Indexing

Database technique for faster searching.

SQL (Structured Query Language)

Language used to interact with databases.

11.4 Networking, Security & Infrastructure

Authentication

Verifying the identity of a user or system.

Authorization

Permission defining what a user can access.

Cloud Computing

Using remote servers (AWS, Azure, GCP) instead of local machines.

Firewall

Security system that controls network traffic.

IP Address

Unique address identifying a device on a network.

Virtual Machine (VM)

Software-based computer running inside another computer.

VPN (Virtual Private Network)

Secure encrypted network connection.

11.5 Artificial Intelligence & Machine Learning

Artificial Intelligence (AI)

Systems that perform tasks requiring human-like intelligence.

Machine Learning (ML)

AI that learns patterns from data.

Deep Learning

ML based on neural networks with many layers.

Natural Language Processing (NLP)

AI that understands and processes human language.

Training Data

Data used to teach a model how to make predictions.

11.6 Web, UI/UX & Mobile Development

Responsive Design

Website layout that adapts to screen size.

REST API

API style using HTTP methods (GET, POST, etc.).

UI (User Interface)

Visual design of screens, buttons, and elements.

UX (User Experience)

How a user feels and interacts with a system.

Cross-Platform Development

Building one app that runs on many devices (e.g., Flutter).

11.7 Project, Business, & Systems Terms

Business Analyst

Analyzes business needs and defines system requirements.

ERP (Enterprise Resource Planning)

Large integrated systems used by organizations (SAP, Oracle, Dynamics).

Project Scope

Defines what a project will include and exclude.

Stakeholder

Person or group affected by the project.

Use Case

Describes user interactions with a system.

11.8 Cloud, DevOps & Infrastructure Terms

CI/CD (Continuous Integration / Continuous Deployment)

Automated processes for testing and deploying software.

Container

Lightweight isolated environment (e.g., Docker).

Load Balancer

Distributes traffic across multiple servers.

Monitoring

Tracking system performance, logs, and health.

11.9 IT Career Roles (Short Definitions)

Software Developer

Builds applications and writes code.

Full-Stack Developer

Works on both front-end and back-end.

Mobile Developer

Creates mobile apps for iOS/Android.

DevOps Engineer

Manages deployment, pipelines, and automation.

Database Administrator (DBA)

Manages databases, performance, and backups.

Data Analyst

Examines data to produce insights and reports.

Data Engineer

Builds data pipelines and warehouses.

Cybersecurity Analyst

Protects systems from cyber threats.

Cloud Engineer

Builds and maintains cloud infrastructure.

Systems Analyst

Analyzes problems and designs system solutions.

IT Support Specialist

Assists users with technical issues.

Network Engineer

Designs and maintains network systems.

UI/UX Designer

Creates user interfaces and designs user experiences.

Scrum Master

Facilitates Agile development processes.

Product Manager

Defines product vision, features, and roadmap.

ERP Consultant

Implements enterprise systems for organizations.

11.10 General Technology Terms

Bug

An error or flaw in a software system.

Deployment

Releasing software for real use.

Open Source

Software with publicly available source code.

Server

Machine or software that provides services to other devices.

Virtualization

Running multiple virtual systems on one physical machine.