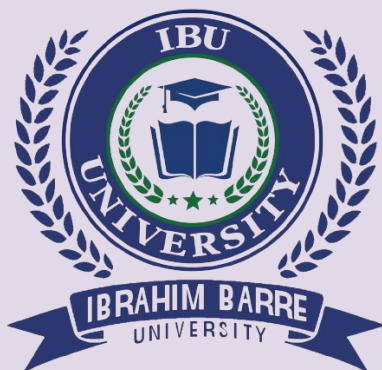# COMPUTER SCIENCE
BACHELOR OF SCIENCE (B.S)

IBRAHIM BARRE UNIVERSITY

FACULTY OF COMPUTER SCIENCE

PROGRAM DURATION

The Faculty of Computer Science at Ibraahim Bare University provides a four-year degree program that prepares students for success in the technology industry.

IBRAHIM BARE UNIVERSITY

Ibraahim Bare University is a prestigious university offering high-quality education, particularly through the Faculty of Computer Science. This faculty provides fundamental knowledge and skills in computer science, helping students become professionals in the rapidly evolving technology sector.

PROGRAMME OBJECTIVES

The Bachelor of Science in Computer Science program aims to educate and develop students in strong theoretical and practical foundations of Computer Science to enable them to excel in the workplace and to be lifelong learners. It is designed to equip students with capabilities for creating and inventing new technological solutions that solve the most pressing problems, particularly in the developing world context. The programme is designed to address the diverse needs of multiple stakeholders by focusing on Computer Science skills required to succeed in the 21st century. Specifically, the objectives of the programme are to:

Develop professionals with theoretical and practical skills in Computer Science

Strengthen institutional capacity and building in Computer Science in tertiary institutions, the private and public sector

Build capacity with a practical orientation needed to link up the Computer Science sector with Government and Industry under the broader perspective of Information and Communication Technology (ICT)

PROGRAM LEARNING OUTCOMES

Graduates of the BSc. Computer Science will be trained with the following learning outcomes. At the end of this program, graduates of the BSc. Computer Science should be able to have theoretical and practical skills in Computer Science

Have the capacity as ICT professionals in Computer Science to meet needs in tertiary institutions, the private and public sector

Have the capacity with a practical orientation needed to link up the Computer Science sector with Government and Industry under the broader perspective of Information and Communication Technology (ICT)

MISSION

The mission of the Faculty of Computer Science is to provide students with a high-quality education in computer science based on current market needs and international standards. Our focus is on developing essential skills in programming, data structures, algorithms, operating systems, databases, and computer networks, enabling students to have deep knowledge in these core areas. We aim to prepare students to become professionals ready to meet the challenges of modern technology.

VISION

The vision is to become the premier institution for computer science education, preparing students to be leaders and specialists in technology progress. We want to raise educational and research standards and create a brighter future in technology.

OBJECTIVES

Provide High-Quality Education: To provide students with fundamental knowledge and abilities in computer science. Encourage research and innovation in emerging technologies. Professional Training: Provide opportunities for hands-on training and real-world projects. Improve Career Opportunities: To provide students with the abilities required to succeed in the IT and computer science job markets. Strengthen Industry Links: Collaborate with technology businesses and research groups to provide students with job and internship opportunities.

GOALS

To Foster Excellence in Computer Science Education: Our goal is to provide a comprehensive and cutting-edge education in Computer Science, focusing on key areas such as Software Development, Databases, Networking, and other essential topics that prepare students for the ever-evolving tech world. To Empower Students for Career Success: We aim to equip students with the necessary skills, knowledge, and hands-on experience to excel in the IT and technology sectors, ensuring they are ready to meet the demands of a dynamic job market. To Inspire Innovation Through Research: We strive to cultivate a culture of research and creativity by encouraging students and faculty to actively engage in innovations and groundbreaking research in areas like artificial intelligence, machine learning, cybersecurity, and cloud computing. To Drive Technological Advancements: Our mission is to inspire and support students in developing innovative ideas and solutions that contribute to the advancement of technology, enabling them to lead and shape the future of the digital world.

Programme Specification

Programme Summary Information	
1	Course Titles	BSc Computer Science
2	Course Code	CS-IBU-2025
3	Awarding Institution	Ibrahim Barre University
4	Program Duration	4 years

5	Faculty of Computer Science - Program Description

The Faculty of Computer Science at Ibraahim Bare University (IBU) is dedicated to offering an innovative and comprehensive academic program designed to prepare students for the dynamic and evolving field of information technology.

Our mission is to provide a high-quality education that fosters both theoretical knowledge and practical skills in computer science, equipping students with the tools to succeed in a wide array of IT-related careers.

Program Overview

The Computer Science program focuses on building a strong foundation in computer science principles and practices. Students will engage with core topics such as programming, software development, computer networks, databases, artificial intelligence, cybersecurity, and systems analysis. The curriculum emphasizes hands-on learning through laboratory work, projects, and internships, allowing students to develop real-world problem-solving skills.

Key Learning Outcomes

Graduates of the Computer Science program will:

1. **Develop proficiency in programming languages** such as Python, Java, and others to build software applications.
2. **Gain expertise in algorithms and data structures**, ensuring effective problem-solving and system optimization.
3. **Understand computer architecture and systems**, including operating systems and networking protocols.
4. **Design and manage databases**, leveraging database management systems like MySQL, Oracle, and SQL Server.
5. **Understand artificial intelligence** and machine learning techniques and their applications.
6. **Master the principles of cybersecurity** to protect systems and data in an increasingly connected world.
7. **Apply knowledge of software engineering principles** to develop, test, and maintain software products.

Career Opportunities

Graduates of the Computer Science program will be well-equipped to pursue a wide variety of career paths, including:

- ❖ Software Developer
- ❖ Network Administrator
- ❖ Data Analyst
- ❖ Cybersecurity Specialist
- ❖ IT Consultant
- ❖ Systems Architect
- ❖ Database Administrator
- ❖ Artificial Intelligence Engineer

Program Structure

The program is structured to ensure a comprehensive learning experience, with core and elective courses that allow students to specialize in areas such as:

- ❖ Software Engineering
- ❖ Computer Networks
- ❖ Data Science and Analytics
- ❖ Artificial Intelligence and Machine Learning
- ❖ Information Systems and Security

Why Choose Ibraahim Bare University's Faculty of Computer Science?

- ❖ **Expert Faculty**: Our faculty members are experienced professionals with advanced degrees and real-world expertise in computer science.
- ❖ **State-of-the-Art Facilities**: The University provides students with access to modern computer labs, high-speed internet, and software tools.
- ❖ **Industry Connections**: Students have the opportunity to connect with industry professionals through internships, career fairs, and collaborations.
- ❖ **Global Certifications**: Our program prepares students for global IT certifications, including CCNA, Network+, and Security+

6	Course Learning Outcomes

The BSc Computer Science program at Ibraahim Bare University equips students with the knowledge, skills, and abilities required to excel in the field of computer science. Upon completing the program, graduates will be able to:

Knowledge and Understanding

- ❖ Demonstrate a deep understanding of core computer science concepts, including algorithms, data structures, programming languages, and computer architecture.
- ❖ Explain the principles of operating systems, database management systems, and computer networks.
- ❖ Analyze the ethical, legal, and social impacts of computing technologies on society.

Cognitive Skills

- ❖ Develop innovative solutions to complex computing problems using logical reasoning and critical thinking.
- ❖ Apply algorithmic and computational techniques to design and analyze software systems.
- ❖ Synthesize information from multiple disciplines to address IT challenges and propose effective solutions.

Practical Skills

- ❖ Design, develop, and debug software applications using modern programming languages and tools.
- ❖ Configure, manage and troubleshoot computer networks and systems.
- ❖ Create and maintain secure and efficient databases for storing and managing large datasets.
- ❖ Implement cybersecurity measures to protect systems and information against digital threats.

Transferable Skills

- ❖ Communicate technical concepts effectively to both technical and non-technical audiences.
- ❖ Collaborate within multidisciplinary teams to deliver IT projects.
- ❖ Demonstrate lifelong learning abilities to stay updated with emerging technologies and practices in the IT field.
- ❖ Utilize project management skills to plan, execute, and deliver IT solutions within specified timeframes.

7	Course Requirements

In order to complete this program a student must successfully complete all the following

CORE modules (totaling 496 credits):

Year 1: Fundamentals

Semester	Course Code	Course Name	Contact Hours /Week	Semester Total Hours
1	CS101	Introduction to Computer Science	2	32
	CS102	Python Programming	3	48
	CS103	Introduction to Linux	3	48
	CS104	Pre-Calculus	3	48
	CS105	English Grammar and Vocabulary	3	48
	CS106	Islamic	2	32
	CS107	MS-Office Application	3	48
2	CS108	Networking Fundamentals	2	32
	CS109	Web Design I	2	32
	CS110	Discrete Mathematics I	2	32
	CS111	Somali	3	48
	CS112	English Academic Writing Skills	3	48

Year 2: Core Systems and Development

In order to complete this program a student must successfully complete all the following CORE modules (totalling 416 credits): ,

Semester	Course Code	Course Name	Contact Hours /Week	Semester Total Hours
3	CS201	Advanced Networking	3	48
	CS202	Web Design II	2	32
	CS203	Fundamentals of Database Systems	2	32
	CS204	English Communication Skills	3	48
	CS205	Discrete Mathematics II	2	32
4	CS206	Digital Logic Design	3	48
	CS207	Windows Server Administrator	3	48
	CS208	Multimedia Systems	2	32
	CS209	English Reading Skills	3	48
	CS210	Linear Algebra	3	48

Year 3: Advanced Knowledge and Applications

In order to complete this program a student must successfully complete all the following CORE modules (totalling 432 credits):

Semester	Course Code	Course Name	Contact Hours /Week	Semester Total Hours
5	CS301	Programming in Java	3	48
	CS302	Introduction to Artificial Intelligence	3	48
	CS303	PHP Programming	3	48
	CS304	Research Methodology	3	48
	CS305	Probability and Statistics	3	48
6	CS306	Machine Learning	3	48
	CS307	Data Structures and Algorithms	3	48
	CS308	Mobile App Development	3	48
	CS309	Cybersecurity Principles	3	48

Year 4: Specialization and Projects

In order to complete this program a student must successfully complete all the following CORE modules (totalling 336 credits):

Semester	Course Code	Course Name	Contact Hours/ Week	Semester Total Hours
7	CS401	Oracle Database Administration	3	48
	CS402	Principles of Information Security	3	48
	CS403	Civic And Ethical Education	3	48
	CS404	Capstone Project I	3	48
8	CS405	Advanced Mobile Application Development	3	48
	CS406	Capstone Project II	3	48
	CS407	Seminar in Emerging Trends	3	48

Year 1						
Semester						
1	Introduction to Computer Science	Python Programming	Introduction to Linux	Pre-Calculus	English Grammar and Vocabulary	Islamic	MS-Office Application
2	Networking Fundamentals	Web Design I	Discrete Mathematics I	Somali	English Academic Writing Skills		

Year 2						
Semester						
1	Advanced Networking	Web Design II	Fundamentals of Database Systems	English Communication Skills	Discrete Mathematics II		
2	Digital Logic Design	Windows Server Administrator	Multimedia Systems	English Reading Skills		Linear Algebra	

Year 3						
Semester						
1	Programming in Java	Introduction to Artificial Intelligence	PHP Programming	Research Methodology		Probability and Statistics	
2	Data Structures and Algorithms	Mobile App Development	Cybersecurity Principles	Machine Learning			

Year 4						
Semester						
1	Oracle Database Administration	Principles of Information Security	Civic And Ethical Education	Capstone Project I			
2	Advanced Mobile Application Development	Seminar in Emerging Trends	Capstone Project II				

No	Course Name
ELECTIVE COURSES	
1.	Principles of Management
2.	Public speaking and Communication Skills
3.	Introduction to Cloud Computing
4.	Internet of Things (IoT)
5.	Robotics and Automation
6.	Bioinformatic
7.	Augmented Reality and Virtual Reality