



1.0 Faculty of Computing and Informatics

1.0.1 Brief History of Faculty of Computing and Informatics

The faculty of computing and informatics, located at Amoud University main campus, five kilometers from Borama town center, was established on September 15th, 2009. The faculty admitted 33 students in the bachelor of information technology programme the same year and graduated 24 of the cohort in August 2012. The faculty then mounted diploma in information technology (DIT) on March 1st, 2014; bachelor of business information technology (BBI) on September 15th, 2012; bachelor of software engineering (BSE) on September 15th, 2018 and bachelor of electronics and telecommunication engineering (ETE) on September 15th, 2019. By 2020 the faculty had graduated 650 students from various programmes, out of which 463 (71%) are males and the rest 187 (29%) are females. The ETE programme was later transferred to Faculty of Engineering as of March 2023. Three additional programmes were then mounted on September 15th, 2023 namely Bachelor Data Science (BDS), Bachelor of Cyber Security (BCS) and Bachelor of Information Systems (BIS). The current enrolment is 878: 603 (69%) males and 275 (31%) females. The faculty is well established to offer all its range of programmes.

The faculty has three (3) functional and well equipped computer laboratories fitted with overhead digital projectors and personal computers. In addition, the faculty has an engineering and computational laboratory, with state-of-the-art telecommunications equipment, including transport nodes, data packet routers, voice over IP gears, and a cluster of Linux workstations for protocols development and testing, that provides extensive facilities for research in telecommunications, microelectronics, and computer science. The telecommunication laboratory has training kits for fiber optics, antennas, microwaves, among other areas. Students attend extended industrial attachment training periods to gain experience get exposed to the real equipment used various fields of specialization of computing and informatics.

There is free WiFi 24/7 on campus internet connections in all computer laboratories and surrounding areas hosted by two local internet service providers, with a total of 20 Mbps download and 20 Mbps upload internet speeds. The main university library has an array of information materials for further reading, and several electronic books and reference materials are also available through Amoud University Google classroom suite. The faculty has a well balanced team of highly competent local and non-local staff, trained locally and abroad. The teaching staff is readily available to help students as needs arise. Each programme is allocated sufficient time and with efficient management, the faculty ensures that students complete their courses on time. Furthermore, the faculty works in partnership with other institutions, government units and other organizations in areas of common interest including research, project facilitation, training and capacity development.

1.0.2 Statements of Purposes for Faculty of Computing and Informatics

1.0.2.1 Our Vision

To become a leading institution of higher learning of good international repute providing home-grown, real-time and research-based solutions to the myriad problems encountered in Computing and, Information Communication and Technology areas and to be the regional electronic hub for fostering peace and development, through enhanced communication.

1.0.2.2 Our Mission

To respond positively to evolving socio-economic needs by designing and implementing computing and informatics education programmes that produce graduates with knowledge, skills and competencies to discern problems and design software solutions that reflect and contextualize diversity at all levels.

1.0.2.3 Our Objectives

The objectives of faculty of computing and informatics are:

1. To churn out highly qualified professionals whose knowledge base and grasp of computing and informatics are unmatched locally and beyond.
2. To produce techno-savvy graduates capable of matching the challenges of this fast dynamic digital age, who can create job opportunities for themselves and for others by applying the global multifaceted world of computing and informatics concepts.
3. To spearhead academic research and publication in the horn of Africa region by both staff and students at the faculty, and application of the proposed solutions from such research activities to help solve the myriad range of computing and information communication and technology problems facing the horn of Africa and the international community at large.

1.0.2.4 Our Core Values

In everything we do, and at all times, we shall always be guided by four (4) core values:

1. **Distinction:** We do everything with excellence, to the best of our ability.
2. **Integrity:** We hold ourselves upright, honest and accountable at all times.
3. **Self-discipline:** We are committed to excellence in our work with minimum or no supervision, whether individually or in groups, and whether or outside the faculty.
4. **Character:** We carry ourselves with charisma and amiable personality in all situations.

1.0.3 Functions and Responsibilities of Faculty of Computing and Informatics.

1.0.3.1 Functions of Faculty of Computing and Informatics

It is the function of faculty of computing and informatics to:

1. Recruit an academically talented student body from diverse economic, racial and ethnic backgrounds; attract and retain an active, culturally and academically diverse faculty of the highest caliber, skilled in the scholarship of teaching, discovery, application and integration.
2. Enhance the quality of life through research and creative activities.
3. Be a catalyst in finding solutions to social, economic and cultural challenges facing society, by dissemination and application of results from its basic and applied research.
4. Promote close working ties with its graduates, for mutual benefit.
5. Promote inter campus visits, projects, sports, competitions and academic challenges.

1.0.3.2 Responsibilities of Faculty of Computing and Informatics

It shall be the responsibility of the faculty of computing and informatics to:

1. Influence the development and implementation of computing solutions in Somaliland and beyond through collaboration with the relevant government bodies and other non-state actors.
2. Transform ICT practice by producing competent graduates who may lend their expertise to existing firms, lead research firms in IT solutions and also back up startups that value integration of computing and informatics in their business models.
3. Influence and aid in the implementation of sustainable development goals through digitization and automation of government projects and programs.
4. Revolutionize education system within the university and beyond, through automation of academic and examination processes and procedures, and offer practical solutions and user support including through distance and online learning and development of university management systems modules.

5. Revolutionize the working environment by offering alternative options of working away from office through the internet by providing technical support to different sectors and actors of the economy.

1.0.4 Programmes Summary

The degree of bachelor of information technology (BIT) provides a theoretical and practical foundation in Information Technology. Students pursuing the degree will major in two main areas: database management systems and web systems. Other basic areas are programming and systems development, networking and data communications, and multimedia systems. The programme emphasizes application of professional and ethical principles and quality assurance and security in all facets of information technology. The programme is provided through coursework, examinations and project. Students enrolled in the programme will cover 52 courses: 7 foundational courses, 30 core and 15 specialty courses in a period of 8 semesters in 4 academic years. A student shall be eligible for graduation after accumulating 158 credit units, including at least 300 hours of industrial internship.

The bachelor of business information technology (BBI) programme provides training in information technology and computing skills for developing and implementing sophisticated business-related computer systems; with practical application of computing to business problem-solving. The need for multi-skilled human resource to handle both information technology management and business administration is still unmatched and so is the demand for multi-pronged techno-savvy system developers, network managers and administrative business managers. This bachelor of business information technology programme is designed to produce information technology professionals who are equipped with business tools and whose orientation is in management. The programme builds students' capacity to critically analyze, design, implement and manage information technologies with a focus on overall business productivity and strategic objectives. The programme is provided through coursework, examinations and project. Students enrolled in this programme shall cover 53 courses: 7 foundational courses, 30 core and 15 specialty courses in a period of 8 semesters in 4 years. A student shall be eligible for graduation after accumulating 161 credit units, including at least 300 hours of industrial internship.

The bachelor of software engineering (BSE) programme provides project rich learning experiences to prospective software engineers to be successful in the rapidly evolving computing field. Graduates of this programme should be persons who can identify, formulate and solve complex problems by applying principles of computing, engineering, science and mathematics. They should apply engineering designs to produce solutions that meet specific needs in contexts of health, safety, and welfare as well as cultural, social, environmental, and economic contexts in the global arena. The programme is provided through coursework, examinations and project. Students enrolled in this programme shall cover 53 courses: 7 foundational courses, 30 core and 12 specialty courses in a period of 8 semesters in 4 years. A student shall be eligible for graduation after accumulating 161 credit units, including at least 300 hours of industrial internship.

The degree of bachelor of Data Science (BDS) requires effective integration of a domain to provide data and a context for its exploration, statistics, and computer science. Domain experts understand their data and perhaps know what they can expect to learn from the data. They want tools and techniques to get the job done. They need to know enough about the tools and techniques to be confident that the results will be reliable. First, statisticians bring expertise in "data analysis, data collection, modeling, and inference." Statistical models "describe, predict, and explain processes". Secondly, computer scientists bring methods for dependable storage, for protecting privacy, and the integrity of the data. They bring expertise in applying high performance computing and networked systems for efficient computation. Thirdly, algorithms

for machine learning and deep learning techniques allow results that go beyond direct analysis of the existing data and offer opportunities for discovery that may not be anticipated by the data owners. Computer Science offers tools for the analysis of data of all types, whether numeric, text, image, sound, or complex combinations of basic data types. Each component of the Data Science environment: the domain that provides the data; statistics and mathematics for analysis, modeling, and inference; and computer science for data access, management, protection, as well as effective processing in modern computer architectures, is essential. Amoud University BDS programme therefore is interdisciplinary and has effectively integrated the three components to produce meaningful results. The programme is provided through coursework, examinations and project. Students enrolled in the programme will cover 52 courses: 7 foundational courses, 30 core and 15 specialty courses in a period of 8 semesters in 4 academic years. A student shall be eligible for graduation after accumulating 158 credit units, including at least 300 hours of industrial internship and capstone project.

The bachelor of cyber security (BCS) programme is aimed at preparing professionals, who will gain skills in the principles of cyber security, security of data networks, penetration testing and risk management. Graduates will be able to apply fundamental security principles and formal security models to solve problems in cyber security; develop, maintain and implement information security policies; and communicate effectively with internal and external stakeholders about cyber security issues. This degree prepares individuals to become security analysts, network defenders, and computer incident responders with coursework that gives them a comprehensive understanding of information management and security processes. The programme is provided through coursework, examinations and project. Students enrolled in this programme shall cover 50 courses: 7 foundational courses, 26 core (major) and 17 specialty courses in a period of 8 semesters in 4 years. A student shall be eligible for graduation after accumulating 152 credit units, including at least 300 hours of industrial internship.

The bachelor of information systems (BIS) programme is aimed at preparing professionals, who will gain fundamental and applied knowledge in informatics engineering and develop the skills required for the secure analysis, design, structuring and maintenance of information systems. This degree prepares individuals to develop applications, implement databases, maintain networks, and create websites with security as the focal point. It provides not only grounding in the principles of safeguarding digital data, but also a practical skill set immediately applicable in the real world, where companies can no longer afford to ignore cyber security threats. The programme is provided through coursework, examinations and project. Students enrolled in this programme shall cover 51 courses: 7 foundational courses, 18 core (major) and 25 specialty courses in a period of 8 semesters in 4 years. A student shall be eligible for graduation after accumulating 155 credit units, including at least 300 hours of industrial internship.

1. BACHELOR OF INFORMATION TECHNOLOGY

1.1 Bachelor of Information Technology

1.1.1 Programme Background and Rationale

The bachelor of information technology programme is designed to produce computing graduates with strong technical knowledge to function effectively as database programmers, web developers, and IT support persons with a strong foundation for continued career growth. The programme brings together conceptual knowledge, problem solving, and independent critical thinking skills that are needed by information technology professionals. The growth of IT sector in Somaliland over the last decade and the emergence of global knowledge economy in the horn of Africa region and beyond require highly-skilled multidisciplinary IT professionals knowledgeable on new methods, tools and innovation systems. Amoud University through this programme is positioning itself to strategically produce more relevant information technology experts required for the ever expanding IT needs.

The fiber optic cable laid down recently in Somaliland has led to exponential increase in the internet speeds and data bandwidth, thus further entrenching demand for ICT services and experts. Therefore through this programme, Amoud University and the faculty of computing and informatics intends to produce highly skilled and relevant entrepreneurial professionals for the Information Technology sector in Somaliland and the Horn of Africa and the regional market at large. The programme is modeled with the pillars of IT including programming, networking, human-computer interaction, databases, and web systems, built on a foundation of knowledge of the fundamentals of IT. Overarching the entire foundation and pillars are information assurance and security, and professionalism. The programme has been developed in consonance with the Association for Computing Machinery (ACM) IEEE Computer Society (IEEE-CS) Task Group (International information technology curricula, <https://www.acm.org/education/curricula-recommendations>, 2017).

1.2 Programme Objectives

1.2.1 General Objective

This programme should produce modern database administrators and web developers, with most modern knowledge and skills for a successful professional career in computing and informatics. It should produce top professionals who can quickly get involved in the work process, with innovative mentality, self-confidence and ability to lead technology, business and society.

1.2.2 Specific Objectives

By the end of the programme, students should:

1. Have broad understanding of information technology business related problems and emerging potential methods for solving them and the ability to design, implement and evaluate a computer based system, process, component, or program to meet desired needs while functioning effectively in teams to accomplish common goals through effective communication with a wide range of audiences.
2. Have broad knowledge of computing and mathematics appropriate to the discipline and capacity to apply this knowledge to analyze a problem, identify and define the computing requirements appropriate to its solution while demonstrating knowledge and awareness of the wide range of updated information technology tools and techniques coupled with strong analytical and critical thinking skills for solving the current problems in ICT.
3. Exhibit practical competence, and the capacity to design, implement and evaluate database management and web authoring specific computing project; they should be able to use current technology concepts and practices in the core information technologies to identify and

analyze user needs and take them into account in the selection, creation, evaluation and administration of computer based systems.

4. Develop and exhibit strong ethical principles, good interpersonal communication and team skills necessary for IT industry; and ability to effectively integrate IT-based solutions into the user environment based on best practices and standards.
5. Have broad understanding of professional, ethical, legal, security and social issues and responsibilities in the analysis of the local and global impact of computing on individuals, organizations and society.

1.3 Target Groups and Outcomes

1.3.1 Target Groups

The target group for the bachelor of information technology programme includes but is not limited to:

1. Students who have successfully completed Somaliland General Secondary School Certificate (SGCSE) or its equivalent from a recognized examination body and further completed Amoud University freshman academic year successfully and who wish to pursue a career in information technology.
2. People already working in the field of information technology or related fields but would like to add new skills set to their professional work and attain formal certification in information technology.
3. Other persons with insight in information technology and would like to pursue the challenge of information technology at the undergraduate degree level.

1.3.2 Expected Programme Outcomes

The graduates of the bachelor of information technology programme should be persons who are:

1. Expert consultants in database and web systems development for public and private organizations at the local and international levels as well as for private individuals, offering tailor-made or bespoke solutions to the clientele's challenges.
2. Employees of business tech companies and especially as database administrators and web masters, who are responsible for analyzing, designing, developing, maintaining or re-engineering database management systems and websites for specific needs of the corporate firms and private organizations.
3. Private database administrators and web developers in self-employment, who can analyze market, identify software problems and design and develop working software and systems solutions for the shelves.

1.4 Programme Resources

1.4.1 Staff, Facilities and Equipment

The faculty of computing and informatics, and the department of software engineering have adequate resources to offer this programme. The faculty has three (3) functional and well equipped computer laboratories fitted with over-head digital projectors and personal computers. In addition, the faculty has an engineering and computational laboratory, with state-of-the-art telecommunications equipment, including transport nodes, data packet routers, voice over IP gears, and a cluster of Linux workstations for protocols development and testing, that provides extensive facilities for research in telecommunications, microelectronics, and computer science. The telecommunication laboratory has training kits for Fiber optics, Antennas, microwaves, among other areas. Students attend extended industrial attachment training periods to gain experience get exposed to the real equipment used in software engineering.

There is free WiFi 24/7 on campus internet connections in all computer laboratories and surrounding areas hosted by two local internet service providers, with a total of 20Mbps download and 20Mbps upload internet speeds. The main university library has an array of

information materials for further reading, and several electronic books and reference materials are also available through Amoud University Google classroom suite. The faculty has a well balanced team of highly competent local and non-local staff, trained locally and abroad. The teaching staff is readily available to help students as needs arise. The programme is allocated sufficient time and with efficient management, the faculty ensures that students complete their courses on time.

1.4.2 Funding

The programme of bachelors of information technology is sustained largely by funds from tuition fees and other relevant levies. The student must show proof of ability to pay tuition fees on time before being enrolled into the programme. There are no special funding arrangements for the students enrolled in the programme of bachelor of information technology. However, if and when, additional funds are available, they shall be dispensed according to the university financial policies.

1.5 Course List for Bachelor of Information Technology

The programme for the bachelor of information technology is fully covered with the following 52 courses. All courses are compulsory.

Course Code	Course Title	CU
FRM 6111	Introduction to reading	3
FRM 6112	Introduction to writing	3
FRM 6113	Introduction to biology	3
FRM 6114	Arabic language	3
FRM 6115	Pre-calculus	3
FRM 6121	English academic writing	3
FRM 6122	Islamic studies	3
BIT 6121	Probability and Statistics	3
BIT 6122	Fundamentals of information technology	3
BIT 6123	Fundamentals of computer networks	3
BIT 6124	Introduction to physics	3
BIT 6211	Data communication and computer networks	3
BIT 6212	Computer architecture and organization	3
BIT 6213	Computer applications and maintenance	3
BIT 6214	Web design and publishing (HTML/CSS)	3
BIT 6215	Programming methodology (C)	3
BIT 6216	Linear algebra	3
BIT 6217	Computer graphics	3
BIT 6221	Database management systems I (Principles of DBMS in Access)	3
BIT 6222	Operating systems	3
BIT 6223	Network design and implementation	3
BIT 6224	Client-side web programming (JavaScript)	3
BIT 6225	Systems analysis and design	3
BIT 6226	Application programming I (VB.Net)	3
BIT 6227	Multimedia Laboratory	3
BIT 6311	Database management systems II (Enterprise database development in SQL server)	3
BIT 6312	Discrete mathematics	3
BIT 6313	Data structures and algorithms	3
BIT 6314	Application programming II (C#)	3
BIT 6315	Routing and switching	3

BIT 6316 Internet applications (CMSs)	3
BIT 6317 IT project management	3
BIT 6321 Database management systems III (Distributed databases in oracle)	3
BIT 6322 Artificial intelligence	3
BIT 6323 Digital logic and design	3
BIT 6324 Entrepreneurship skills	3
BIT 6325 Object-oriented programming (C++)	3
BIT 6326 Server-side web programming (PHP and My SQL)	3
BIT 6327 Research methods and technical writing in IT	3
BIT 6331 Industrial attachment and report	5
BIT 6411 Software engineering	3
BIT 6412 Java programming	3
BIT 6413 Data mining and data warehousing	3
BIT 6414 Python Programming	3
BIT 6415 Network server administration (Microsoft Windows Server)	3
BIT 6416 IT individual project I(Proposal)	3
BIT 6421 Linux operating system	3
BIT 6422 Electronic commerce	3
BIT 6423 Database management systems IV (Database design and implementation)	3
BIT 6424 Artificial intelligence	3
BIT 6425 Cyber security	3
BIT 6426 IT individual project II (Implementation and report)	3

1.6 Regulations for Bachelor of Information Technology

1.6.1 General Regulations

General University regulations and guidelines for undergraduate programmes shall apply with regard to application, registration, teaching, learning, examinations, research and graduation. A student is required to sign a memorandum of understanding during the registration process on pre-scribed forms.

1.6.2 Admission Requirements

This bachelor of information technology programme is best suited to students with interest in becoming future database administrators or web masters in business tech firms. To qualify for admission into the degree of bachelor of information technology, an applicant shall:

1. Hold a Somaliland GCSE of at least Grade "C", or its equivalent from a recognized examination body.
2. Successfully complete a one-year freshman programme at Amoud University, and attain a GPA of at least 2.00.
3. Meet other conditions as spelt out by the Faculty of Computing and Informatics and the department of information technology, with approval of Senate.

1.6.2 Enrolment Types

There shall be three (3) categories of enrolments as follows:

1. Full-Time Day face-to-face enrolled students who shall attend classes between 7.30 am 4.30 pm from Saturday to Thursday.
2. Full-Time Evening face-to-face enrolled students who shall attend classes between 4.00 pm and 10.00 pm from Saturday to Thursday.

3. Sandwich, part-time, and other modes enrolled students who shall attend classes during specific periods as specified by the Faculty of Science and department of Information Technology, and approved by Senate.

1.7 The Curriculum

1.7.1 Programme Duration

The programme run on a semester basis consisting of four semesters each lasting 17 weeks, or part-time basis as appropriately structured by the Faculty of Computing and Informatics and department of information technology, and approved by Senate.

1.7.2 Programme Modalities

The programme shall be conducted by course work, examinations and project, based on credit units. The last two weeks of each semester of each academic year shall normally be used for end-of-semester examinations. Further,

1. A student shall take foundation/general courses in English, mathematics, science, Arabic, Islamic studies during the first one year in the freshmen. The freshman year also acts as a gateway to full admission into the bachelor of information technology programme.
2. By the end of junior year, a student shall be required to attend at least 300 hours of internship in a real work environment.
3. A student shall come up with a well-written project in the area of information technology during the senior year of study.

1.7.3 Curriculum Plan

The programme shall run on a semester basis consisting of eight (8) semesters each lasting 17 weeks in a period of four (4) academic years, whether on full time, part-time, sandwich, or online or other modes as structured by the Faculty of Computing and Informatics, and department of information technology, and approved by Senate.

Freshman semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
FRM 6111	Introduction to reading	45	0	0	0	45	3
FRM 6112	Introduction to writing	45	0	0	0	45	3
FRM 6113	Introduction to biology	30	0	45	0	75	3
FRM 6114	Arabic language	45	0	0	0	45	3
FRM 6115	Pre-calculus	45	0	0	0	45	3
Total		215	0	45	0	215	15
Freshman semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
FRM 6121	English academic writing	45	0	0	0	45	3
FRM 6122	Islamic studies	45	0	0	0	45	3
BIT 6121	Probability and Statistics	45	0	0	0	45	3
BIT 6122	Fundamentals of information technology	45	0	0	0	45	3
BIT 6123	Fundamentals of computer networks	45	0	0	0	45	3
BIT 6124	Introduction to physics	45	0	0	0	45	3
Total		270	0	0	0	270	18
Sophomore semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BIT 6211	Data communication and computer networks	45	0	0	0	45	3
BIT 6212	Computer architecture and organization	45	0	0	0	45	3
BIT 6213	Computer applications and maintenance	30	0	45	0	75	3
BIT 6214	Web design and publishing (HTML/CSS)	30	0	45	0	75	3
BIT 6215	Programming methodology (C)	30	0	45	0	75	3
BIT 6216	Linear algebra	45	0	0	0	45	3
BIT 6217	Computer graphics	30	0	45	0	75	3
Total		255	0	180	0	435	21
Sophomore semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BIT 6221	Database management systems I (Principles of DBMS in Access)	30	0	45	0	75	3
BIT 6222	Operating systems	45	0	0	0	45	3
BIT 6223	Network design and implementation	30	0	45	0	75	3
BIT 6224	Client-side web programming (JavaScript)	30	0	45	0	75	3
BIT 6225	Systems analysis and design	45	0	0	0	45	3
BIT 6226	Application programming I (VB.Net)	30	0	45	0	75	3
BIT 6227	Multimedia Laboratory	30	0	45	0	75	3
Total		240	0	225	0	465	21
Junior semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BIT 6311	Database management systems II (Enterprise database development in SQL server)	30	0	45	0	75	3
BIT 6312	Discrete mathematics	45	0	0	0	45	3
BIT 6313	Data structures and algorithms	30	0	45	0	75	3
BIT 6314	Application programming II (C#)	30	0	45	0	75	3
BIT 6315	Routing and switching	45	0	0	0	45	3
BIT 6316	Internet applications (CMSs)	30	0	45	0	75	3
BIT 6317	IT project management	45	0	0	0	45	3
Total		255	0	180	0	435	21
Junior semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU

BIT 6321	Database management systems III (Distributed databases in Oracle)	30	0	45	0	75	3
BIT 6322	Artificial intelligence	45	0	0	0	45	3
BIT 6323	Digital logic and design	45	0	0	0	45	3
BIT 6324	Entrepreneurship skills	45	0	0	0	45	3
BIT 6325	Object-oriented programming (C++)	30	0	45	0	75	3
BIT 6326	Server-side web programming (PHP and My SQL)	30	0	45	0	75	3
BIT 6327	Research methods and technical writing in IT	45	0	0	0	45	3
Total		270	0	135	0	405	21
Junior semester III							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BIT 6331	Industrial attachment and report	0	0	0	300	300	5
Total		0	0	0	300	300	5
Senior semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BIT 6411	Software engineering	45	0	0	0	45	3
BIT 6412	Java programming	30	0	45	0	75	3
BIT 6413	Data mining and data warehousing	30	0	45	0	75	3
BIT 6414	Python programming	30	0	45	0	75	3
BIT 6415	Network server administration (Microsoft Windows Server)	30	0	45	0	75	3
BIT 6416	IT individual project I(Proposal)	30	30	0	0	60	3
Total		195	30	180	0	405	18
Senior semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BIT 6421	Linux operating system	30	0	45	0	75	3
BIT 6422	Electronic commerce	30	0	45	0	75	3
BIT 6423	Database management systems IV (Database design and implementation)	30	0	45	0	75	3
BIT 6424	Artificial intelligence	45	0	0	0	45	3
BIT 6425	Cyber security	45	0	0	0	45	3
BIT 6426	IT individual project II (Implementation and report)	15	60	0	0	75	3
Total		195	60	135	0	390	18
Grand Total		189	90	108	0	306	153
		0	0	0	0	0	0

2. BACHELOR OF BUSINESS INFORMATION TECHNOLOGY(BBI)

2.1 Bachelor of Business Information Technology

2.1.1 Programme Background and Rationale

The bachelor of business information technology programme is intended to produce business managers with complementary information technology skills. There are many graduates of computing and informatics in the market who lack the capacity to handle business management roles but who desire to do so. On the other hand, there are many graduates of business administration who desire to apply information and communications technology skills to increase their competitive edge in the fast moving digital world, yet do not have such skills. Effective business management or organizations management in general now require managers who are techno- savvy; who are not only capable of making sound business decisions but who can also align such decisions to leverage on technology in order to attain an edge in the ever increasingly competitive world. This creates great need for the blended programme, business information technology.

In a business firm, interdependence between business organizations and information systems, and hence business information technology need not be over emphasized. This business information technology programme, by blending the two fields into one, should enhance performance of both the individual and the organization through operational excellence; new products, services, and business models; customer and supplier intimacy; improved decision-making; competitive advantage and enhanced survival.

2.2 Programme Objectives

2.2.1 General Objective

The business information technology (BBI) degree programme is designed to provide students with expertise in the development and use of computer systems and quantitative modeling techniques for solving business problems and making managerial decisions, in one kit.

2.2.2 Specific Objectives

By the end of the programme, students should:

1. Demonstrate acquisition of hands on skills and abilities to design business systems that significantly improve a firm's business relationships with customers, suppliers, and employees through digital reach and mediation.
2. Be able to relate and accomplish core business processes, and logically related business tasks, through digital networks.
3. Be able to manage key corporate assets of a business entity including intellectual property, core competencies, and financial and human assets, through digital means.
4. Have the capacity to implement enforced business responses to changes in the environment through digital communications, and conduct business globally, beyond traditional geographic boundaries.
5. Possess the necessary academic background for pursuing post-graduate studies in either business, computing and informatics, or related fields.

2.3 Target Groups and Outcomes

2.3.1 Target Groups

The target groups for this programme include:

1. Students who have successfully completed Somaliland General Secondary School Certificate (SGCSE) or its equivalent from a recognized examination body and further completed Amoud

University freshman academic year successfully and would like to pursue a career that ties and binds information technology to business management.

2. Business professionals who are already practicing in the field either as entrepreneurs or as employees, and would like to improve their abilities in decision-making for increased success in the digital world.
3. Information technology professionals who are already in the field either as experts or employees of organizations, and would like to complement their technical skills with ability to make sound business decisions relevant to the current digital world.
4. Other reasonably qualified persons with passion in business information technology.

2.3.2 Expected Programme Outcomes

The target groups for this programme include:

1. Students who have successfully completed Somaliland General Secondary School Certificate (SGCSE) or its equivalent from a recognized examination body and further completed Amoud University freshman academic year successfully and would like to pursue a career that ties and binds information technology to business management.
2. Business professionals who are already practicing in the field either as entrepreneurs or as employees, and would like to improve their abilities in decision-making for increased success in the digital world.
3. Information technology professionals who are already in the field either as experts or employees of organizations, and would like to complement their technical skills with ability to make sound business decisions relevant to the current digital world.
4. Other reasonably qualified persons with passion in business information technology.

2.4 Programme Resources

2.4.1 Staff, Facilities and Equipment

The faculty of computing and informatics, and department of business information technology have adequate resources to offer this programme. The faculty has three (3) functional and well equipped computer laboratories fitted with over-head digital projectors and personal computers. In addition, the faculty has an engineering and computational laboratory, with state-of-the-art telecommunications equipment, including transport nodes, data packet routers, voice over IP gears, and a cluster of Linux workstations for protocols development and testing, that provides extensive facilities for research in telecommunications, microelectronics, and computer science. The telecommunication laboratory has training kits for fiber optics, antennas, microwaves, among other areas. Students attend extended industrial attachment training periods to gain experience get exposed to the real equipment used in software engineering.

There is free WiFi 24/7 on campus internet connections in all computer laboratories and surrounding areas hosted by two local internet service providers, with a total of 20 Mbps download and 20 Mbps upload internet speeds. The main university library has an array of information materials for further reading, and several electronic books and reference materials in business information technology are also available through Amoud University Google classroom suite. The faculty has a well balanced team of highly competent local and non-local staff, trained locally and abroad. The teaching staff is readily available to help students as needs arise. The programme is allocated sufficient time and with efficient management, the faculty ensures that students complete their courses on time.

2.4.2 Funding

The programme of bachelor of business information technology is sustained largely by funds from tuition fees and other relevant levies. The student must show proof of ability to pay tuition fees on time before being enrolled into the programme. There are no special funding arrangements for the students enrolled in the programme of bachelor of information technology.

However, if and when, additional funds are available, they shall be dispensed according to the university financial policies.

2.5 Course List for Bachelor of Business Information Technology

The programme for the bachelor of business information technology is fully covered with the following 54 courses. All courses are compulsory.

Course Code	Course Title	CU
FRM 6111	Introduction to reading	3
FRM 6112	Introduction to writing	3
FRM 6113	Introduction to biology	3
FRM 6114	Arabic language	3
FRM 6115	Pre-calculus	3
FRM 6121	English academic writing	3
FRM 6122	Islamic studies	3
BBI 6121	Probability and statistics	3
BBI 6122	Fundamentals of information technology	3
BBI 6123	Financial Accounting I (Fundamentals of financial accounting)	3
BBI 6124	Introduction to management	3
BBI 6211	Introduction to business	3
BBI 6212	Financial accounting II (Intermediate financial accounting)	3
BBI 6213	Introduction to economics	3
BBI 6214	Principles of marketing	3
BBI 6215	Introduction to computer programming (C)	3
BBI 6216	Web design and publishing (HTML/CSS)	3
BBI 6217	Database management systems I (Principle of DBMS in Access)	3
BBI 6221	Computer operating systems	3
BBI 6222	Business Ethics	3
BBI 6223	Business Law	3
BBI 6224	Management mathematics	3
BBI 6225	Computer networks and data communication	3
BBI 6226	Application programming I (VB.NET)	3
BBI 6227	Client-side web programming (JavaScript)	3
BBI 6311	Entrepreneurship skills	3
BBI 6312	Research methods and technical writing in Business IT	3
BBI 6313	Business information systems	3
BBI 6314	Network design and implementation	3
BBI 6315	Data structures and algorithms	3
BBI 6316	Application programming (C#)	3
BBI 6317	IT project management	3
BBI 6321	Operation management	3
BBI 6322	Business finance	3
BBI 6323	Human resource management	3
BBI 6324	System administration (Linux OS)	3
BBI 6325	Object oriented programming II (Java)	3
BBI 6326	Database management systems II (Enterprise DBMS in SQL-Server)	3
BBI 6327	Server-side web programming (PHP & My-SQL)	3
BIT 6331	Industrial attachment and report	5
BBI 6411	Managerial accounting	3
BBI 6412	Organizational behavior	3
BBI 6413	Introduction to Python	3
BBI 6414	Internet based programming and e-commerce	3

BBI 6415 Multimedia systems and graphics	3
BBI 6416 Business IT Individual Project I (Proposal)	3
BBI 6417 Database management systems III (Mongo-DB)	3
BBI 6421 Total quality management (TQM)	3
BBI 6422 Strategic management	3
BBI 6423 Accounting packages	3
BBI 6424 System analysis and design	3
BBI 6425 Network server administration (Microsoft Windows Server)	3
BBI 6426 Business IT Individual Project II (Implementation and Support)	3

2.6 Regulations for Bachelor of Business Information Technology

2.6.1 General Regulations

General University regulations and guidelines for undergraduate programmes shall apply with regard to application, registration, teaching, learning, examinations, research and graduation. A student is required to sign a memorandum of understanding during the registration process on pre-scribed forms.

2.6.2 Admission Requirements

This bachelor of business information technology programme is best suited to students with interest in becoming future business IT managers in business tech firms. To qualify for admission into the degree of bachelor of business information technology, an applicant shall:

1. Hold a Somaliland GCSE of at least Grade "B", or its equivalent from a recognized examination body.
2. Successfully complete a one-year freshman programme at Amoud University, and attain a GPA of at least 2.00.
3. Meet other conditions as spelt out by the Faculty of Computing and Informatics and the department of business information technology, with approval of Senate.

2.6.3 Enrolment Types

There shall be three (3) categories of enrolments as follows:

1. Full-Time Day face-to-face enrolled students who shall attend classes between 7.30 am 4.30 pm from Saturday to Thursday.
2. Full-Time Evening face-to-face enrolled students who shall attend classes between 4.00 pm and 10.00 pm from Saturday to Thursday.
3. Sandwich, part-time, and other modes enrolled students who shall attend classes during specific periods as specified by the Faculty of Science and department of business information technology, and approved by Senate.

2.7 The Curriculum

2.7.1 Programme Duration

The programme run on a semester basis consisting of four semesters each lasting 17 weeks, or part-time basis as appropriately structured by the Faculty of Computing and Informatics and department of business information technology, and approved by Senate.

2.7.2 Programme Modalities

The programme shall be conducted by course work, examinations and project, based on credit units. The last two weeks of each semester of each academic year shall normally be used for end-of-semester examinations. Further,

1. A student shall take foundation/general courses in English, mathematics, science, Arabic, Islamic studies during the first one year in the freshmen. The freshman year also acts as a gateway to full admission into the bachelor of business information technology programme.
2. By the end of junior year, a student shall be required to attend at least 300 hours of internship in a real work environment.

3. A student shall come up with a well-written project in the area of business information technology during the senior year of study.

2.7.3 Curriculum Plan

The programme shall run on a semester basis consisting of eight (8) semesters each lasting 17 weeks in a period of four (4) academic years, whether on full time, part-time, sandwich, or online or other modes as structured by the Faculty of Computing and Informatics, and department of business information technology, and approved by Senate.

Freshman semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
FRM 6111	Introduction to reading	45	0	0	0	45	3
FRM 6112	Introduction to writing	45	0	0	0	45	3
FRM 6113	Introduction to biology	30	0	45	0	75	3
FRM 6114	Arabic language	45	0	0	0	45	3
FRM 6115	Pre-calculus	45	0	0	0	45	3
Total		210	0	45	0	255	15
Freshman semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
FRM 6121	English academic writing	45	0	0	0	45	3
FRM 6122	Islamic studies	45	0	0	0	45	3
BBI 6121	Probability and statistics	45	0	0	0	45	3
BBI 6122	Fundamentals of information technology	45	0	0	0	45	3
BBI 6123	Financial Accounting I (Fundamentals of financial accounting)	45	0	0	0	45	3
BBI 6124	Introduction to management	45	0	0	0	45	3
Total		270	0	0	0	270	18
Sophomore semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BBI 6211	Introduction to business	45	0	0	0	45	3
BBI 6212	Financial accounting II (Intermediate financial accounting)	45	0	0	0	45	3
BBI 6213	Introduction to economics	45	0	0	0	45	3
BBI 6214	Principles of marketing	45	0	0	0	45	3
BBI 6215	Introduction to computer programming (C)	30	0	45	0	75	3
BBI 6216	Web design and publishing (HTML/CSS)	30	0	45	0	75	3
BBI 6217	Database management systems I (Principle of DBMS in Access)	30	0	45	0	75	3
Total		270	0	135	0	405	21
Sophomore semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BBI 6221	Computer operating systems	45	0	0	0	45	3
BBI 6222	Business ethics	45	0	0	0	45	3
BBI 6223	Business law	45	0	0	0	45	3
BBI 6224	Management mathematics	45	0	0	0	45	3
BBI 6225	Computer networks and data communication	45	0	0	0	45	3
BBI 6226	Application programming I (VB.NET)	30	0	45	0	75	3
BBI 6227	Client-side web programming (JavaScript)	30	0	45	0	75	3
Total		285	0	90	0	375	21
Junior semester I							

Course Code	Course Title	LH	TH	PH	FH	CH	CU
BBI 6311	Entrepreneurship skills	45	0	0	0	45	3
BBI 6312	Research methods and technical writing in Business IT	45	0	0	0	45	3
BBI 6313	Business information systems	45	0	0	0	45	3
BBI 6314	Network design and implementation	30	0	45	0	75	3
BBI 6315	Data structures and algorithms	30	0	45	0	75	3
BBI 6316	Application programming (C#)	30	0	45	0	75	3
BBI 6317	IT project management	30	0	45	0	75	3
Total		255	0	180	0	435	21
Junior semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BBI 6321	Operation management	45	0	0	0	45	3
BBI 6322	Business finance	45	0	0	0	45	3
BBI 6323	Human resource management	45	0	0	0	45	3
BBI 6324	System network administration	30	0	45	0	75	3
BBI 6325	Object oriented programming II (Java)	30	0	45	0	75	3
BBI 6326	Database management system II (Enterprise DBMS in SQL-Server)	30	0	45	0	75	3
BBI 6327	Server-Side web programing (PHP & My-SQL)	30	0	45	0	75	3
Total		255	0	180	0	435	21
Junior semester III							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BIT 6331	Industrial attachment and report	0	0	0	300	300	5
Total		0	0	0	300	300	5
Senior semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BBI 6411	Managerial accounting	45	0	0	0	45	3
BBI 6412	Organizational behavior	45	0	0	0	45	3
BBI 6413	Introduction to Python	30	0	45	0	75	3
BBI 6414	Internet based programming and e-commerce	30	0	45	0	75	3
BBI 6415	Multimedia systems and graphics	30	0	45	0	75	3
BBI 6416	Business IT individual project I (Proposal)	30	30	0	0	60	3
BBI 6417	Database management systems III (Mongo-DB)	30	0	45	0	75	3
Total		240	30	180	0	450	21
Senior semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BBI 6421	Total quality management (TQM)	45	0	0	0	45	3
BBI 6422	Strategic management	45	0	0	0	45	3
BBI 6423	Accounting packages	30	0	45	0	75	3
BBI 6424	System analysis and design	45	0	0	0	45	3
BBI 6425	Network server administration (Microsoft Windows Server)	30	0	45	0	75	3
BBI 6426	Business IT individual project II (Implementation and support)	30	30	0	0	60	3
Total		225	30	90	0	345	18
Grand Total		2010	60	900	300	3270	161

3. BACHELOR OF SOFTWARE ENGINEERING (BSE)

3.1 Bachelor of Software Engineering

3.1.1 Programme Background and Rationale

In the earlier era, the disciplinary focus served the engineering demands well. However, with technological advancements in manufacturing, information, communication, and transportation technologies reshaping the society in unparalleled ways, software engineers are now facing unprecedented challenges. In a global competitive marketplace, consumers are demanding highly sophisticated products, which drive design innovation towards enhanced functionality, and shorter-life-cycle-products. These dynamics now require that software engineering education takes place in cooperative, active-learning environments with participants from diverse backgrounds. Moreover, the evolving market needs require that software products evolve at an even higher rate in order to meet and shape those demands. Further, software engineering has become a popular career choice for skilled programmers the world over. The industry offers wide career choices and opportunities which gives it an edge over other fields. Using the creative side of coding, software engineering is like an art, with a creative side. Therefore this course is designed to produce problem solvers, which itself requires creative skills. The world is now heavily technology dependent: there is unsatisfied need for software engineers due to increasing reliance on mobile technology, venture capital-backed start-ups, growing complexity of technology and emerging industries – all which demand highly skilled and well qualified software engineers.

The development of many physical devices that are connected to the internet further amplify the need for software engineers. Amoud University, in realization of this global need and cognizant of the need for software engineers in the local market, views the mounting of this bachelor of software engineering programme as a means for creating the right personnel to solve the software problems in the country and beyond. The need for reliable and effective software products need not be overstated: emerging issues in all fields created by new conditions that require software solutions will continue to emerge. This software engineering programme is a response to such needs and shall continuously respond to such needs at all times. This programme has been developed with reference to the Joint Task Force on Computing Curricula IEEE Computer Society Association for Computing Machinery (Software Engineering, <https://www.acm.org/education/curricula-recommendations>, 2014). It therefore meets the international standards of software engineering curriculum.

3.2 Programme Objectives

3.2.1 General Objective

The general objective of this programme is to prepare students for professional careers and graduate studies with a balance between computing theory and practical application of software engineering concepts, methodologies, tools and technologies for use in the modern software development environments.

3.2.2 Specific Objectives

By the end of the programme, students should:

1. Acquire professional knowledge and a continuing professional acumen through mastery of software engineering knowledge, skills and professional standards expected of a software engineer. They should be familiar with new models, techniques, and technologies and learn them as they emerge, appreciating the necessity of such continuing professional development.

2. Exhibit technical knowledge and demonstrated understanding and application of appropriate theories, models, and techniques to identify a problem, analyze, design software, develop, implement, verify, and document.
3. Be able to work individually and as part of a team develop and deliver quality software artifacts.
4. Be able to develop end-user awareness, understand and appreciate the importance of negotiation, effective work habits, leadership, and good communication with stakeholders in a typical software development environment.
5. Be able to design appropriate solutions in specific contexts and perform trade-offs in one or more application domains using software engineering approaches that integrate ethical, social, legal, and economic concerns; reconcile conflicting project objectives and find acceptable compromises within the limitations of cost, time, knowledge, existing systems, and organizations.

3.3 Target Groups and Outcomes

3.3.1 Target Groups

The target group for the bachelor of software engineering programme includes but is not limited to:

1. Students who have successfully completed Somaliland General Secondary School Certificate (SGCSE) or its equivalent from a recognized examination body and further completed Amoud University freshman academic year successfully and who wish to pursue a career in Software Engineering.
2. People who are already working in the field of software engineering or related fields but would like to add new skills set to their professional work and attain formal certification in software engineering.
3. Other persons with insight in software engineering and would like to pursue the challenge of software engineering at the undergraduate degree level.

3.3.2 Expected Programme Outcomes

The graduates of the Bachelor of Software Engineering programme should be persons who are:

1. Expert consultants in software development for public and private organizations at the local and international levels as well as for individuals, offering tailor-made or bespoke solutions to the clientele's challenges.
2. Employees of tech-driven companies and specifically as software engineers, who are responsible for analyzing, designing, developing, maintaining or re-engineering software systems for specific needs of corporate firms and private organizations.
3. Private software developers in self-employment, who can analyze the market, identify software problems and design and develop working software solutions for the shelves.

3.4 Programme Resources

3.4.1 Staff, Facilities and Equipment

The faculty of computing and informatics and the department of software engineering have adequate resources to offer this programme. The faculty has three (3) functional and well equipped computer laboratories fitted with over-head digital projectors and personal computers. In addition, the faculty has an engineering and computational laboratory, with state-of-the-art telecommunications equipment, including transport nodes, data packet routers, voice over IP gears, and a cluster of Linux workstations for protocols development and testing, that provides extensive facilities for research in telecommunications, microelectronics, and computer science. The telecommunication laboratory has training kits for fiber optics, antennas, microwaves, among other areas. Students attend extended industrial attachment training periods to gain experience get exposed to the real equipment used in software engineering.

There is free WiFi24/7 on campus internet connections in all computer laboratories and surrounding areas hosted by two local internet service providers, with a total of 20 Mbps download and 20 Mbps upload internet speeds. The main university library has an array of information materials for further reading, and several electronic books and reference materials are also available through Amoud University Google classroom suite. The faculty has a well balanced team of highly competent local and non-local staff, trained locally and abroad. The teaching staff is readily available to help students as needs arise. The programme is allocated sufficient time and with efficient management, the faculty ensures that students complete their courses on time.

3.4.2 Funding

The programme of bachelor of software engineering is sustained largely by funds from tuition fees and other relevant levies. The student must show proof of ability to pay tuition fees on time before being enrolled into the programme. There are no special funding arrangements for the students enrolled in the programme of bachelor of software engineering. However, if and when, additional funds are available, they shall be dispensed according to the university financial policies.

3.5 Course List for Bachelor of Software Engineering

The programme for the bachelor of software engineering is fully covered with the following 54 courses. All courses are compulsory.

Course Code	Course Title	CU
FRM 6111	Introduction to reading	3
FRM 6112	Introduction to writing	3
FRM 6113	Introduction to biology	3
FRM 6114	Arabic language	3
FRM 6115	Pre-calculus	3
FRM 6121	English academic writing	3
FRM 6122	Islamic studies	3
BSE 6121	Probability and statistics	3
BSE 6122	Fundamentals of information technology	3
BSE 6123	Fundamentals of computer networks	3
BSE 6124	Introduction to physics	3
BSE 6211	Programming technique I (C)	3
BSE 6212	Computer architecture and organization	3
BSE 6213	Principles of database management systems (Access)	3
BSE 6214	Linear algebra	3
BSE 6215	Introduction to software engineering	3
BSE 6216	Human computer interaction	3
BSE 6217	Multimedia systems and graphics	3
BSE 6221	Programming technique II (Python)	3
BSE 6222	Data structures and algorithms	3
BSE 6223	Software requirements engineering	3
BSE 6224	Software modeling and architectural design	3
BSE 6225	Web design (HTML/CSS)	3
BSE 6226	Systems software (Computer operating systems)	3
BSE 6227	Discrete mathematics	3
BSE 6311	Programming technique III (Java)	3
BSE 6312	Unified modeling language ((UML)	3
BSE 6313	Web development (JavaScript)	3
BSE 6314	Artificial intelligence and software agents	3

BSE 6315 Enterprise database development (Oracle)	3
BSE 6316 Software research project concepts and proposals	3
BSE 6317 Digital logic and design	3
BSE 6321 Programming technique IV (PHP/My SQL)	3
BSE 6322 Ethical hacking (Linux)	3
BSE 6323 Enterprise database development (SQL server)	3
BSE 6324 Agile software development and practice	3
BSE 6325 Mobile application I: Programming concept	3
BSE 6326 Software program complexity and computability	3
BSE 6327 Simulation and modeling	3
BSE 6331 Industrial attachment and report	5
BSE 6411 Programming technique V (C#)	3
BSE 6412 Distributed enterprise applications (ERPs)	3
BSE 6413 Data mining and data warehousing	3
BSE 6414 Software reliability and security	3
BSE 6415 Mobile application II: project design and implementation	3
BSE 6416 SE individual project I (proposal)	3
BSE 6417 Document oriented database (Mongo DB)	3
BSE 6421 Software quality assurance	3
BSE 6422 Software project management	3
BSE 6423 Entrepreneurship skills for software engineers	3
BSE 6424 Professional and ethical issues in software engineering	3
BSE 6425 Emerging issues and technologies of the future	3
BSE 6426 SE individual project II (implementation and report)	3

3.6 Regulations for Bachelor of Software Engineering

3.6.1 General Regulations

General University regulations and guidelines for undergraduate programmes shall apply with regard to application, registration, teaching, learning, examinations, research and graduation. A student is required to sign a memorandum of understanding during the registration process on pre-scribed forms.

3.6.2 Admission Requirements

This bachelor of software engineering programme is best suited to students with interest in becoming future database administrators or web masters in business tech firms. To qualify for admission into the degree of bachelor of software engineering, an applicant shall:

1. Hold a Somaliland GCSE of at least Grade "C", or its equivalent from a recognized examination body.
2. Successfully complete a one-year freshman programme at Amoud University, and attain a GPA of at least 2.00.
3. Meet other conditions as spelt out by the Faculty of Computing and Informatics and the department of software engineering, with approval of Senate.

3.6.2 Enrolment Types

There shall be three (3) categories of enrolments as follows:

1. Full-Time Day face-to-face enrolled students who shall attend classes between 7.30 am 4.30 pm from Saturday to Thursday.
2. Full-Time Evening face-to-face enrolled students who shall attend classes between 4.00 pm and 10.00 pm from Saturday to Thursday.

3. Sandwich, part-time, and other modes enrolled students who shall attend classes during specific periods as specified by the Faculty of Computing and Informatics and department of software engineering, and approved by Senate.

3.7 The Curriculum

3.7.1 Programme Duration

The programme run on a semester basis consisting of four semesters each lasting 17 weeks, or part-time basis as appropriately structured by the Faculty of Computing and Informatics and department of software engineering, and approved by Senate.

3.7.2 Programme Modalities

The programme shall be conducted by course work, examinations and project, based on credit units. The last two weeks of each semester of each academic year shall normally be used for end-of-semester examinations. Further,

1. A student shall take foundation/general courses in English, mathematics, science, Arabic, Islamic studies during the first one year in the freshmen. The freshman year also acts as a gateway to full admission into the bachelor of software engineering programme.
2. By the end of junior year, a student shall be required to attend at least 300 hours of internship in a real work environment.
3. A student shall come up with a well-written project in the area of software engineering during the senior year of study.

3.7.3 Curriculum Plan

The programme shall run on a semester basis consisting of eight (8) semesters each lasting 17 weeks in a period of four (4) academic years, whether on full time, part-time, sandwich, or online or other modes as structured by the Faculty of Computing and Informatics, and department of software engineering, and approved by Senate.

Freshman semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
FRM 6111	Introduction to reading	45	0	0	0	45	3
FRM 6112	Introduction to writing	45	0	0	0	45	3
FRM 6113	Introduction to biology	30	0	45	0	75	3
FRM 6114	Arabic language	45	0	0	0	45	3
FRM 6115	Pre-calculus	45	0	0	0	45	3
Total		210	0	45	0	255	15
Freshman semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
FRM 6121	English academic writing	45	0	0	0	45	3
FRM 6122	Islamic studies	45	0	0	0	45	3
BSE 6121	Probability and statistics	45	0	0	0	45	3
BSE 6122	Fundamentals of information technology	45	0	0	0	45	3
BSE 6123	Fundamentals of computer networks	45	0	0	0	45	3
BSE 6124	Introduction to physics	45	0	0	0	45	3
Total		270	0	0	0	270	18
Sophomore semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BSE 6211	Programming technique I (C)	30	0	45	0	75	3
BSE 6212	Computer architecture and organization	45	0	0	0	45	3
BSE 6213	Principles of database management systems (Access)	30	0	45	0	75	3
BSE 6214	Linear algebra	45	0	0	0	45	3
BSE 6215	Introduction to software engineering	45	0	0	0	45	3
BSE 6216	Human computer interaction	45	0	0	0	45	3
BSE 6217	Multimedia systems and graphics	30	0	45	0	75	3
Total		270	0	135	0	405	21
Sophomore semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BSE 6221	Programming technique II (Python)	30	0	45	0	75	3
BSE 6222	Data structures and algorithms	30	0	45	0	75	3
BSE 6223	Software requirements engineering	45	0	0	0	45	3
BSE 6224	Software modeling and architectural design	45	0	0	0	45	3
BSE 6225	Web design (HTML/CSS)	30	0	45	0	75	3
BSE 6226	Systems software (Computer operating systems)	45	0	0	0	45	3
BSE 6227	Discrete mathematics	45	0	0	0	45	3
Total		270	0	135	0	405	21
Junior semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BSE 6311	Programming technique III (Java)	30	0	45	0	75	3
BSE 6312	Unified modeling language ((UML)	45	0	0	0	45	3
BSE 6313	Web development (JavaScript)	30	0	45	0	75	3
BSE 6314	Artificial intelligence and software agents	45	0	0	0	45	3
BSE 6315	Enterprise database development (Oracle)	30	0	45	0	75	3
BSE 6316	Software research project concepts and proposals	45	0	0	0	45	3
BSE 6317	Digital logic and design	45	0	0	0	45	3
Total		270	0	135	0	405	21
Junior semester II							

Course Code	Course Title	LH	TH	PH	FH	CH	CU
BSE 6321	Programming technique IV (PHP/My SQL)	30	0	45	0	75	3
BSE 6322	Ethical Hacking (Linux)	30	0	45	0	75	3
BSE 6323	Enterprise database development (SQL server)	30	0	45	0	75	3
BSE 6324	Agile software development and practice	45	0	0	0	45	3
BSE 6325	Mobile application I: Programming concept	30	0	45	0	75	3
BSE 6326	Software program complexity and computability	45	0	0	0	45	3
BSE 6327	Simulation and modeling	30	0	45	0	75	3
Total		240	0	225	0	465	21
Junior semester III							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BSE 6331	Industrial attachment and report	0	0	0	300	300	5
Total		0	0	0	300	300	5
Senior semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BSE 6411	Programming technique V (C#)	30	0	45	0	75	3
BSE 6412	Distributed enterprise applications (ERPs)	30	0	45	0	75	3
BSE 6413	Data mining and data warehousing	30	0	45	0	75	3
BSE 6414	Software reliability and security	45	0	0	0	45	3
BSE 6415	Mobile application II: Project design and implementation	30	0	45	0	75	3
BSE 6416	SE individual project I (proposal)	30	30	0	0	120	3
BSE 6417	Document oriented database (Mongo DB)	30	0	45	0	75	3
Total		225	30	225	0	480	21
Senior semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BSE 6421	Software quality assurance	45	0	0	0	45	3
BSE 6422	Software project management	30	0	45	0	75	3
BSE 6423	Entrepreneurship skills for software engineers	45	0	0	0	45	3
BSE 6424	Professional and ethical issues in software engineering	45	0	0	0	45	3
BSE 6425	Emerging issues and technologies of the future	45	0	0	0	45	3
BSE 6426	SE individual project II (implementation and report)	15	60	0	0	75	3
Total		225	60	45	0	330	18
Grand Total		1995	90	945	300	3330	161

4. BACHELOR OF DATA SCIENCE

4.1 Bachelor of Data Science

4.1.1 Programme Background and Rationale

Data Science (DS) is an inherently interdisciplinary field. The rise of data science is directly connected to the rise of large data sets in nearly every topic domain across the world. The physical sciences, social sciences, business, humanities, and engineering all are seeing opportunities for discovery and decision-making expanded by unprecedented large amounts of raw or structured data, too large to be subjected to effective human analysis without the automation of the processes. Data Science brings together domain data, computer science, and the statistical tools for interrogating the data and extracting useful information in a multi-disciplinary approach.

Big Data and analytics have become invaluable segments of every business in the world but as demand for data scientists grows globally, a talent shortage exists, with its effect being worst felt in Africa. Faced with a myriad of industrial bottlenecks, Africa needs data scientists more than any other continent, in order to create tailored solutions to its challenges. Data sits at the center of the global Fourth Industrial Revolution (4 IR) with analysts believing now is Africa's opportunity to create its own talent to help businesses make informed decisions, predict markets, and prepare for unforeseen calamities.

Somaliland's government and industry have recognized data science as a great opportunity for sustainable economic development. Somaliland has all key attributes to develop in this sector except skilled workers including shortage of data scientists. This is a pertinent issue identified by the government and business community.

Amoud University bachelor of data science programme therefore will not only help organisations to become more effective, but will also build capacity and boost industry potential. With its high-speed internet link and enormous potential for solar and wind power, Somaliland has great potential to host data centres. But it will need skilled man power to accompany these prospects. The programme will provide an avenue for Somaliland to bridge the gap in home grown skilled man power and export data science experts to the rest of the region.

The Amoud University bachelor of data science programme is built with strong link to Big Data and data driven technologies to create transformational effect on research and industry domains, and inspires re-thinking and re-design of both traditional educational models and existing courses.

This programme has been developed in consonance with Association for Computer Machinery (ACM) Data Science Task Force (Competencies for Undergraduate Data Science Curricula, <https://dl.acm.org/citation.cfm?id=3453538>, January 2021)

4.2 Programme Objectives

4.2.1 General Objective

The general objective of this programme is to produce Data Science experts with a strong focus on the collection, manipulation and analysis of large volumes of data and how to use this to bring about beneficial insights and changes to an organization and to the wider society.

4.2.2 Specific Objectives

By the end of the programme, students should be able to:

1. Use common programming languages such as Python and R or other domain specific libraries to manipulate and analyze large data in both private and public data depositories.
2. Efficiently understand gigantic data from multiple sources and derive valuable insights to make smarter data-driven decisions in various industry domains, including marketing, healthcare, finance, banking, policy work.
3. Explain and interpret the numerical conclusions in the client's terminology, and deliver text and graphics ready to be digested by non-technical personnel.

4.3 Target Groups and Outcomes

4.3.1 Target Groups

The target group for the bachelor of data science programme includes but is not limited to:

4. Students who have successfully completed Somaliland General Secondary School Certificate (SGCSE) or an equivalent from a recognized examination body and who wish to pursue a career.
5. People already working in the field of data science or related fields such as machine learning, business intelligence, statistics or data mining but would like to add new skills set to their professional work and attain formal advanced certification in data science.
6. Other persons with insight in data science and would like to pursue the challenge of data science at the undergraduate degree level.

4.3.2 Expected Programme Outcomes

The Graduates of the bachelor of data science programme should be persons who are:

4. Consultants in a range of data-driven industries and organisations as; analytics specialists; business intelligence developer; data analysts ; data architects; data engineers; data miners; data scientists; machine learning engineers; programmers; research data scientists or web analysts.
5. Statistical analysts who will apply statistical and computational tools to applied problems, and clearly communicate the results in both written reports and oral presentations.
6. Data management specialists who develop and implement strategies for data collection, storage, preservation, and availability for further processing in organizations.

4.4 Programme Resources

4.4.1 Staff, Facilities and Equipment

The faculty of computing and informatics, and the department of data science have adequate resources to offer this programme. The faculty has three (3) functional and well equipped computer laboratories fitted with over-head digital projectors and personal computers. In addition, the faculty has an engineering and computational laboratory, with state-of-the-art telecommunications equipment, including transport nodes, data packet routers, voice over IP gears, and a cluster of Linux workstations for protocols development and testing, that provides extensive facilities for research in telecommunications, microelectronics, and computer science.

The telecommunication laboratory has training kits for Fiber optics, Antennas, microwaves, among other areas. Students attend extended industrial attachment training periods to gain experience get exposed to the real equipment used in software engineering.

There is free WiFi 24/7 on campus internet connections in all computer laboratories and surrounding areas hosted by two local internet service providers, with a total of 20Mbps download and 20Mbps upload internet speeds. The main university library has an array of information materials for further reading, and several electronic books and reference materials are also available through Amoud University Google classroom suite. The faculty has a well balanced team of highly competent local and non-local staff, trained locally and abroad. The teaching staff is readily available to help students as needs arise. The programme is allocated sufficient time and with efficient management, the faculty ensures that students complete their courses on time.

4.4.2 Funding

The programme of bachelor of data science is sustained largely by funds from tuition fees and other relevant levies. The student must show proof of ability to pay tuition fees on time before being enrolled into the programme. There are no special funding arrangements for the students enrolled in the programme of bachelor of data science. However, if and when, additional funds are available, they shall be dispensed according to the university financial policies.

4.5 Course List for Bachelor of data science

The programme for the bachelor of data science is fully covered with the following 49 courses. All courses are compulsory.

Course Code	Course Title	CU
FRM 6111:	Introduction to reading	3
FRM 6112:	Introduction to writing	3
FRM 6113:	Introduction to biology	3
FRM 6114:	Arabic language	3
FRM 6115:	Pre-calculus	3
FRM 6121:	English academic writing	3
FRM 6122:	Islamic studies	3
BDS 6121:	Introduction to probability and statistics	3
BDS 6122:	Fundamentals of information technology	3
BDS 6123:	Introduction to physics	3
BDS 6124:	Fundamentals of computer networks	3
BDS 6211:	Introduction to data analytics and statistical packages	3
BDS 6212:	Computer architecture and organization	3
BDS 6213:	Fundamentals of data science	3
BDS 6214:	Introduction to computer programming (C)	3
BDS 6215:	Web design and publishing (HTML/CSS)	3
BDS 6216:	Linear Algebra	3
BDS 6221:	Python programming	3
BDS 6222:	Client-side web programming (JavaScript)	3
BDS 6223:	Operating systems	3
BDS 6224:	Database management system I (Principles of DBMS in Access)	3

BDS 6225: Regression modeling and multivariate analysis	3
BDS 6226: Discrete mathematics	3
BDS 6227: Research methodologies in DS	3
BDS 6311: Artificial intelligence	3
BDS 6312: Java programming	3
BDS 6313: Database management systems II (Enterprise database development in SQL server)	3
BDS 6314: Data collection methods and tools in DS	3
BDS 6315: Data structures and algorithms	3
BDS 6316: Time series analysis	3
BDS 6317: Network design and implementation	3
BDS 6321: Cloud computing (MS Azure/ AWS)	3
BDS 6322: Data visualization (with R)	3
BDS 6323: Machine learning	3
BDS 6324: ANOVA designs for data science	3
BDS 6325: Data mining and data warehousing	3
BDS 6326: Probability theory	3
BDS 6327: Database management system III (Mongo-DB)	3
BDS 6331: Industrial attachment and report	5
BDS 6411: Data science project management	3
BDS 6412: Modeling and simulation	3
BDS 6413: Mobile app development (React Native)	3
BDS 6414: Big data and analytics	3
BDS 6415: Data science individual project I (Proposal)	2
BDS 6416: Bayesian statistics	3
BDS 6421: Professional dashboards (Tableau and Excel)	3
BDS 6422: Deep learning and decision making	3
BDS 6423: Data privacy and security	3
BDS 6424: Ethics of data analytics	3
BDS 6425: Data science individual project II (Implementation and report)	3
BDS 6426: Advanced machine learning models	3

4.6 Regulations for Bachelor of data science

4.6.1 General Regulations

General University regulations and guidelines for undergraduate programmes shall apply with regard to application, registration, teaching, learning, examinations, research and graduation. A student is required to sign a memorandum of understanding during the registration process on pre-scribed forms.

4.6.2 Admission Requirements

This bachelor of data science programme is best suited to students with interest in becoming future data scientists or big data analysts in business tech firms. To qualify for admission into the degree of bachelor of data science, an applicant shall:

4. Hold a Somaliland GCSE of at least Grade “C”, or its equivalent from a recognized examination body.

5. Successfully complete a one-year freshman programme at Amoud University, and attain a GPA of at least 2.00.
6. Meet other conditions as spelt out by the Faculty of Computing and Informatics and the department of data science, with approval of Senate.

4.6.2 Enrolment Types

There shall be three (3) categories of enrolments as follows:

4. Full-Time Day face-to-face enrolled students who shall attend classes between 7.30 am 4.30 pm from Saturday to Thursday.
5. Full-Time Evening face-to-face enrolled students who shall attend classes between 4.00 pm and 10.00 pm from Saturday to Thursday.
6. Sandwich, part-time, and other modes enrolled students who shall attend classes during specific periods as specified by the Faculty of Science and department of data science, and approved by Senate.

4.7 The Curriculum

4.7.1 Programme Duration

The programme run on a semester basis consisting of four semesters each lasting 17 weeks, or part-time basis as appropriately structured by the Faculty of Computing and Informatics and department of data science, and approved by Senate.

4.7.2 Programme Modalities

The programme shall be conducted by course work, examinations and project, based on credit units. The last two weeks of each semester of each academic year shall normally be used for end-of-semester examinations. Further,

4. A student shall take foundation/general courses in English, mathematics, science, Arabic, Islamic studies during the first one year in the freshmen. The freshman year also acts as a gateway to full admission into the bachelor of data science programme.
5. By the end of junior year, a student shall be required to attend at least 300 hours of internship in a real work environment.
6. A student shall come up with a well-written project in the area of data science during the senior year of study.

4.7.3 Curriculum Plan

The programme shall run on a semester basis consisting of eight (8) semesters each lasting 17 weeks in a period of four (4) academic years, whether on full time, part-time, sandwich, or online or other modes as structured by the Faculty of Computing and Informatics, and department of data science, and approved by Senate.

Freshman semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
FRM 6111	Introduction to reading	45	0	0	0	45	3
FRM 6112	Introduction to writing	45	0	0	0	45	3
FRM 6113	Introduction to biology	45	0	0	0	45	3
FRM 6114	Arabic language	45	0	0	0	45	3
FRM 6115	Pre-calculus	45	0	0	0	45	3
Total		225	0	0	0	225	15
Freshman semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
FRM 6121	English academic writing	45	0	0	0	45	3
FRM 6122	Islamic studies	45	0	0	0	45	3
BDS 6121	Introduction to probability and statistics	45	0	0	0	45	3
BDS 6122	Fundamentals of information technology	45	0	0	0	45	3
BDS 6123	Introduction to physics	45	0	0	0	45	3
BDS 6124	Fundamentals of computer networks	45	0	0	0	45	3
Total		270	0	0	0	270	18
Sophomore semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BDS 6211	Introduction to data analytics and statistical packages	30	0	45	0	75	3
BDS 6212	Computer architecture and organization	45	0	0	0	45	3
BDS 6213	Fundamentals of data science	45	0	0	0	45	3
BDS 6214	Introduction to computer programming (C)	30	0	45	0	75	3
BDS 6215	Web design and publishing (HTML/CSS)	30	0	45	0	75	3
BDS 6216	Linear Algebra	45	0	0	0	45	3
Total		225	0	135	0	360	18
Sophomore semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BDS 6221	Python programming	30	0	45	0	75	3
BDS 6222	Client-side web programming (JavaScript)	30	0	45	0	75	3
BDS 6223	Operating systems	45	0	0	0	45	3
BDS 6224	Database management system I (Principles of DBMS in Access)	30	0	45	0	75	3
BDS 6225	Regression modeling and multivariate analysis	30	0	45	0	75	3
BDS 6226	Discrete mathematics	45	0	0	0	45	3
BDS 6227	Research methodologies in DS	45	0	0	0	45	3
Total		255	0	180	0	435	21
Junior semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BDS 6311	Artificial intelligence	45	0	0	0	45	3
BDS 6312	Java programming	30	0	45	0	75	3
BDS 6313	Database management systems II (Enterprise database development in SQL server)	30	0	45	0	75	3
BDS 6314	Data collection methods and tools in DS	45	0	0	0	45	3
BDS 6315	Data structures and algorithms	30	0	45	0	75	3

BDS 6316	Time series analysis	30	0	45	0	75	3
BDS 6317	Network design and implementation	30	0	45	0	75	3
Total		240	0	225	0	465	21
Junior semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BDS 6321	Cloud computing (MS Azure/ AWS)	30	0	45	0	75	3
BDS 6322	Data visualization (with R)	30	0	45	0	75	3
BDS 6323	Machine learning	30	0	45	0	75	3
BDS 6324	ANOVA designs for data science	45	0	0	0	45	3
BDS 6325	Data mining and data warehousing	30	0	45	0	75	3
BDS 6326	Probability theory	45	0	0	0	45	3
BDS 6327	Database management system III (Mongo-DB)	30	0	45	0	75	3
Total		240	0	225	0	465	21
Junior semester III							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BDS 6331	Industrial attachment and report	0	0	0	300	300	5
Total		0	0	0	300	300	5
Senior semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BDS 6411	Data science project management	45	0	0	0	45	3
BDS 6412	Modeling and simulation	30	0	45	0	75	3
BDS 6413	Mobile app development (React Native)	30	0	45	0	75	3
BDS 6414	Big data and analytics	30	0	45	0	75	3
BDS 6415	Data science individual project I (Proposal)	15	30	0	0	45	2
BDS 6416	Bayesian statistics	45	0	0	0	45	3
Total		225	30	135	0	360	17
Senior semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BDS 6421	Professional dashboards (Tableau and Excel)	30	0	45	0	75	3
BDS 6422	Deep learning and decision making	30	0	45	0	75	3
BDS 6423	Data privacy and security	45	0	0	0	45	3
BDS 6424	Ethics of data analytics	45	0	0	0	45	3
BDS 6425	Data science individual project II (Implementation and report)	30	30	0	0	45	3
BDS 6426	Advanced machine learning models	30	0	45	0	75	3
Total		210	30	135	0	360	18
Grand Total		1890	60	1035	300	3240	154

5. BACHELOR OF CYBER SECURITY

5.1 Bachelor of Cyber Security

5.1.1 Programme Background and Rationale

Cyber security is one of today's most critical emerging disciplines in the field of computing. It involves technology, people, information, and processes to enable assured operations in the context of adversaries. It is crucial to Information Systems (ISS) due to the need to protect information and devices housing essential data and to plan safeguards and backup plans against potential attacks.

Globally, individuals within and outside the organization are most likely to pose a threat. It is critical to have the right safeguards in place and to keep staff alert through cyber security experts, whether it is cyber criminals attacking the organization maliciously with phishing emails, malware, ransom ware, or social engineering attacks - or it is employees "accidentally" deleting crucial data.

East Africa has one of the fastest-growing economies in the region, and the world. This has increased the digital infrastructure in the region, with the integration of fibre-optic cable, stronger satellite connections and faster broadband. The ICT sector has ballooned as well as the number of people using the internet. This has unintentionally paved the way for cybercrime to prey on the opportunities presented in the internet market.

In Somaliland, government agencies, Internet Service Providers (ISP), ICT Solutions companies, Telecom operators, Small and Medium-Sized Enterprises (SMEs), critical infrastructure providers, academia, and citizens including Child Online Protection (COP) need help to solve the most critical cyber security issues. The Somaliland government needs to build its own internal capacity to be able to protect the national assets (data) and keep its integrity, and foster a culture of security, including cyber security for its citizens' national security. In this new interconnected world, cyber security is a global challenge, security of everyone is intertwined. As Somaliland builds its own electronic government and digital ecosystems, there is opportunity to adopt approaches that are secure by design. This will increase trust in government platforms to deliver public services digitally to all corners of the country. It will also help boost investor confidence and create an environment conducive to developing homegrown talent, which, in turn, will be key to unlocking Somaliland's potential to become a regional leader in the digital sector.

Bachelor of Cyber Security programme focuses on developing graduates with strong digital defenses to keep organizations and clients' data safe, monitor potential threats, perform routine security checks, develop software to identify and destroy malicious viruses, and advise organizations on best practices to keep data safe. The programme focuses on the assessment, evaluation and communication of key aspects of Information Systems/Information Technology as enablers of modern organisations, protection of corporate data, and customers' personal information, in order to stay profitable and trustworthy. Therefore through this programme, Amoud University and the faculty of computing and informatics intends to produce highly skilled and relevant Cyber Security graduates, who are well endowed with the theories, skills and competencies in Data Security, Software Security, Component Security, Connection Security,

System Security, Human Security, Organizational Security, Societal Security. This is in line with Amoud University's vision and mission in that it is anchored on investing in information technology with a view to nurturing innovators.

This programme has been developed in consonance with Competencies for Undergraduate Cyber security Curricula, ACM/IEEE-CS The Joint Task Force on Cyber security education, December 2017 (Web link: <https://dl.acm.org/citation.cfm?id=3184594>).

5.2 Programme Objectives

5.2.1 General Objective

The general objective of this programme is to produce students who can assess, evaluate and communicate key security aspects of IT/IS as enablers of modern organizations and provide a risk-free and secure environment in which data, networks, and devices can be protected from cyber attacks to remain profitable and trustworthy.

5.2.2 Specific Objectives

By the end of the programme, students should possess the following characteristics:-

1. Ability to implement confidentiality in organizations to prevent unauthorized disclosure of information through encryption, access control, authentication, authorization and physical security.
2. Capacity to provide integrity for guaranteeing that data is real, correct, and protected against unauthorized user modification and assured integrity through backups, checksums and codes for data correction.
3. Competence to ensure availability of information and data, and capacity to access and modify them in a timely manner through physical protection and computational redundancy.

5.3 Target Groups and Outcomes

5.3.1 Target Groups

The target group for the Cyber Security programme includes but is not limited to:

7. Students who have successfully completed Somaliland General Secondary School Certificate (SGCSE) or its equivalent from a recognized examination body and who wish to pursue a career in cyber security.
8. People already working in the field of Cyber Security or related fields but would like to add new skills set to their professional work and attain formal advanced certification in Cyber Security.
9. Other persons with insight in Cyber Security who would like to pursue the challenges of Cyber Security at the undergraduate degree level.

5.3.2 Expected Programme Outcomes

The graduates of the Cyber Security programme should be persons who are:

1. Application security engineers and cyber security experts in private and public organizations who are able to analyze complex computing problems and apply principles of computing and other relevant disciplines to provide solutions.
2. Security architects who design, implement, and evaluate computing-based solutions to meet given sets of computing requirements.

3. Information security officers and consultants who recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

5.4 Programme Resources

5.4.1 Staff, Facilities and Equipment

The faculty of computing and informatics, and the department of Cyber Security have adequate resources to offer this programme. The faculty has three (3) functional and well equipped computer laboratories fitted with over-head digital projectors and work stations. There is free WiFi 24/7 on campus internet connections in all computer laboratories and surrounding areas hosted by two local internet service providers, with a total of 20Mbps download and 20Mbps upload internet speeds. The main university library has an array of information materials for further reading, and several electronic books and reference materials are also available through Amoud University Google classroom suite. The faculty has a well balanced team of highly competent local and non-local staff, trained locally and abroad. The teaching staff that are available to help students as needs arise. The programme is allocated sufficient time and with efficient management, the faculty ensures that students complete their courses on time.

5.4.2 Funding

The programme of Bachelor of Cyber Security is sustained largely by funds from tuition fees and other relevant levies. The student must show proof of ability to pay tuition fees on time before being enrolled into the programme. There are no special funding arrangements for the students enrolled in the programme of bachelor of cyber security. However, if and when, additional funds are available, they shall be dispensed according to the university financial policies.

5.5 Course List for Bachelor of Cyber Security

The programme for the Bachelor of cyber security is fully covered with the following 50 courses. All courses are compulsory.

Course Code	Course Title	CU
FRM 6111:	Introduction to reading	3
FRM 6112:	Introduction to writing	3
FRM 6113:	Introduction to biology	3
FRM 6114:	Arabic language	3
FRM 6115:	Pre-calculus	3
FRM 6121:	English academic writing	3
FRM 6122:	Islamic studies	3
BCS 6121:	Probability and statistics	3
BCS 6122:	Fundamentals of information technology	3
BCS 6123:	Introduction to physics	3
BCS 6124:	Fundamentals of computer networks	3
BCS 6211:	Computer applications and maintenance	3
BCS 6212:	Database management systems I (SQL server)	3
BCS 6213:	Introduction to software engineering	3
BCS 6214:	Foundations of cyber security (Security plus +)	3
BCS 6215:	Network design and implementation	3
BCS 6216:	Web design (HTML/CSS)	3

BCS 6217: Introduction to Python programming for cyber security	3
BCS 6221: Numerical analysis	3
BCS 6222: Routing and switching (CCNA)	3
BCS 6223: Reverse engineering	3
BCS 6224: Cyber security ethics, law and policy	3
BCS 6225: Database management systems II (Oracle and PL/SQL)	3
BCS 6226: Secure software development	3
BCS 6311: Cyber security risk management	3
BCS 6312: Cyber security project management	3
BCS 6313: Cryptography	3
BCS 6314: Microsoft windows server	3
BCS 6315: Mobile and wireless security	3
BCS 6316: Linux OS	3
BCS 6321: Foundations of information security (CISM)	3
BCS 6322: Digital forensics	3
BCS 6323: Data centre infrastructure planning	3
BCS 6324: Cloud computing	3
BCS 6325: Ethical hacking	3
BCS 6326: Penetration testing and vulnerability analysis	3
BCS 6327: Research methods in cyber security	3
BCS 6331: Industrial attachment and report	5
BCS 6411: Virtualization and cloud computing security	3
BCS 6412: Advanced information security (CISSP)	3
BCS 6413: Advanced Python scripting	3
BCS 6414: Entrepreneurship skills for cyber security	3
BCS 6415: Incidence report and malware analysis	3
BCS 6416: Cyber security individual project I (Proposal)	3
BCS 6421: Disaster recovery planning	3
BCS 6422: Data mining and data warehousing	3
BCS 6423: Trends in information systems	3
BCS 6424: Information systems testing, quality assurance and security	3
BCS 6425: Big data and machine learning	3
BCS 6426: Cyber security individual project II (Implementation and support)	3

5.6 Regulations for Bachelor of Cyber Security

5.6.1 General Regulations

General University regulations and guidelines for undergraduate programmes shall apply with regard to application, registration, teaching, learning, examinations, research and graduation. A student is required to sign a memorandum of understanding during the registration process on pre-scribed forms.

5.6.2 Admission Requirements

This bachelor of Cyber Security programme is best suited to students with interest in becoming future system penetration testers, security engineers, architects or even Chief Information Security Officers (CISOs) who sit on company boards of directors. To qualify for admission into the degree of bachelor of cyber security, an applicant shall:

7. Hold a Somaliland GCSE of at least Grade "C", or its equivalent from a recognized examination body.
8. Successfully complete a one-year freshman programme at Amoud University, and attain a GPA of at least 2.00.
9. Meet other conditions as spelt out by the Faculty of Computing and Informatics and the department of cyber security, with approval of Senate.

5.6.3 Enrolment Types

There shall be three (3) categories of enrolments as follows:

7. Full-Time Day face-to-face enrolled students who shall attend classes between 7.30 am 4.30 pm from Saturday to Thursday.
8. Full-Time Evening face-to-face enrolled students who shall attend classes between 4.00 pm and 10.00 pm from Saturday to Thursday.
9. Sandwich, part-time, and other modes enrolled students who shall attend classes during specific periods as specified by the Faculty of Computing and Informatics and department of Cyber Security, and approved by Senate.

5.7 The Curriculum

5.7.1 Programme Duration

The programme run on a semester basis consisting of four semesters each lasting 17 weeks, or part-time basis as appropriately structured by the Faculty of Computing and Informatics and department of Cyber Security, and approved by Senate.

5.7.2 Programme Modalities

The programme shall be conducted by course work, examinations and project, based on credit units. The last two weeks of each semester of each academic year shall normally be used for end-of-semester examinations. Further,

7. A student shall take foundation/general courses in English, mathematics, science, Arabic, Islamic studies during the first one year in the freshmen. The freshman year also acts as a gateway to full admission into the bachelor of Cyber Security programme.
8. By the end of junior year, a student shall be required to attend at least 300 hours of internship in a real work environment.
9. A student shall come up with a well-written project in an area of Cyber Security during the senior year of study.

5.7.3 Curriculum Plan

The programme shall run on a semester basis consisting of eight (8) semesters each lasting 17 weeks in a period of four (4) academic years, whether on full time, part-time, sandwich, or online or other modes as structured by the Faculty of Computing and Informatics, and department of Cyber Security, and approved by Senate.

Freshman semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
FRM 6111	Introduction to reading	45	0	0	0	45	3
FRM 6112	Introduction to writing	45	0	0	0	45	3
FRM 6113	Introduction to biology	30	0	45	0	75	3
FRM 6114	Arabic language	45	0	0	0	45	3
FRM 6115	Pre-calculus	45	0	0	0	45	3
Total		210	0	45	0	255	15
Freshman semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
FRM 6121	English academic writing	45	0	0	0	45	3
FRM 6122	Islamic studies	45	0	0	0	45	3
BCS 6121	Probability and statistics	45	0	0	0	45	3
BCS 6122	Fundamentals of information technology	45	0	0	0	45	3
BCS 6123	Introduction to physics	45	0	0	0	45	3
BCS 6124	Fundamentals of computer networks	45	0	0	0	45	3
Total		270	0	0	0	270	18
Sophomore semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BCS 6211	Computer applications and maintenance	30	0	45	0	75	3
BCS 6212	Database management systems I (SQL server)	30	0	45	0	75	3
BCS 6213	Introduction to software engineering	45	0	0	0	45	3
BCS 6214	Foundations of cyber security (Security plus +)	45	0	0	0	45	3
BCS 6215	Network design and implementation	30	0	45	0	75	3
BCS 6216	Web design (HTML/CSS)	30	0	45	0	75	3
BCS 6217	Introduction to Python programming for cyber security	30	0	45	0	75	3
Total		240	0	225	0	465	21
Sophomore semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BCS 6221	Numerical analysis	30	0	45	0	75	3
BCS 6222	Routing and switching (CCNA)	30	0	45	0	75	3
BCS 6223	Reverse engineering	30	0	45	0	75	3
BCS 6224	Cyber security ethics, law and policy	45	0	0	0	45	3
BCS 6225	Database management systems II (Oracle and PL/SQL)	30	0	45	0	75	3
BCS 6226	Secure software development	30	0	45	0	75	3
Total		195	0	225	0	420	18
Junior semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BCS 6311	Cyber security risk management	45	0	0	0	45	3
BCS 6312	Cyber security project management	45	0	0	0	45	3
BCS 6313	Cryptography	30	0	45	0	75	3
BCS 6314	Microsoft windows server	30	0	45	0	75	3
BCS 6315	Mobile and wireless security	30	0	45	0	75	3
BCS 6316	Linux OS	30	0	45	0	75	3

Total		210	0	180	0	390	18
Junior semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BCS 6321	Foundations of information security (CISM)	30	0	45	0	75	3
BCS 6322	Digital forensics	30	0	45	0	75	3
BCS 6323	Data centre infrastructure planning	45	0	0	0	45	3
BCS 6324	Cloud computing	30	0	45	0	75	3
BCS 6325	Ethical hacking	30	0	45	0	75	3
BCS 6326	Penetration testing and vulnerability analysis	30	0	45	0	75	3
BCS 6327	Research methods in cyber security	45	0	0	0	45	3
Total		240	0	225	0	465	21
Junior semester III							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BCS 6331	Industrial attachment and report	0	0	0	300	300	5
Total		0	0	0	300	300	5
Senior semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BCS 6411	Virtualization and cloud computing security	30	0	45	0	75	3
BCS 6412	Advanced information security (CISSP)	45	0	0	0	45	3
BCS 6413	Advanced python scripting	30	0	45	0	75	3
BCS 6414	Entrepreneurship skills for cyber security	45	0	0	0	45	3
BCS 6415	Incidence report and malware analysis	30	0	45	0	75	3
BCS 6416	Cyber security individual project I (Proposal)	15	30	0	0	45	2
Total		210	30	135	0	360	17
Senior semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BCS 6421	Disaster recovery planning	45	0	0	0	45	3
BCS 6422	Data mining and data warehousing	30	0	45	0	75	3
BCS 6423	Trends in information systems	45	0	0	0	45	3
BCS 6424	Information systems testing, quality assurance and security	45	0	0	0	45	3
BCS 6425	Big data and machine learning	30	0	45	0	75	3
BCS 6426	Cyber security individual project II (Implementation and support)	30	30	0	0	45	3
Total		225	30	90	0	330	18
Grand Total		1800	60	1125	300	3255	151

6. BACHELOR OF INFORMATION SYSTEMS

6.1 Bachelor of Information Systems

6.1.1 Programme Background and Rationale

The IS profession belongs to the broader Information Communication Technology/Information Technology (ICT / IT) profession and shares many core professional competencies with it. IT professionals use information systems (IS) to collect, organize, and distribute data. These systems are crucial to organizations that host a lot of data electronically as most government and private firms in Somaliland and the Horn of Africa region nowadays do. The information system of an organization consists of the information technology infrastructure, application systems, and personnel that employ information technology to deliver information and communications services for transaction processing/operations and administration/management of the organization. It utilizes computer and communications hardware and software, manual procedures, and internal and external repositories of data; and apply a combination of automation, human actions, and user machine interaction.

It is evident that information system is becoming increasingly ingrained in the everyday business, professional and personal lives. They have become more pervasive, and it is difficult to get through the day without interacting with an information system. The “user” in an IS has expanded from just the industry employees to now all types of individuals; IS while has become more society-centric than organization-centric. Therefore a computing curriculum for the IS discipline has become not just an added advantage but a necessity in the modern society. Competencies in IS foundations, data, technology, development, organizational and integration have become part and parcel of organization and individual’s daily lives.

From a global perspective, the role of information systems need not be overemphasized. Its influence in business enterprises, government sector and indeed personal lives speaks for itself. From an academic perspective, information systems in Africa at large and the horn of Africa region in particular has huge role to play in developing the content’s and the region’s own human resource in careers like web development, database administration, computer programming, and security. In the context of Somaliland, IS experts are required to develop a range of solutions for a myriad of challenges including in health information systems to supplement government efforts in bringing health services to the people, land information systems for planning and controlling the fast growing Somaliland cities coupled with land challenges. They are also required in the voting systems to support the fledgling political processes within the country among several other opportunities including banking, defense, research, transportation, mining, trade and industry. All these efforts are geared towards supporting human capital development, as espoused in Amoud University’s motto. Bachelor of Information Systems focuses on the technical and analytical skills of Information system design and management. The country and the region is in need of persons with ability to assess, evaluate, and communicate key aspects of Information Systems as enablers of modern organisations.

Amoud University and the faculty of computing and informatics through this programme will produce highly skilled and relevant Information Systems graduates who will have fundamental competencies in all core the areas of system and web programming, Databases, IT Infrastructure and integration, and Ethics, and Security, among others in line with Undergraduate Information Systems Curricula, ACM/ AIS The Joint ACM/ AIS IS2020 Task Force, December 2020 (Web link: <https://dl.acm.org/citation.cfm?id=3460863>).

6.2 Programme Objectives

6.2.1 General Objective

The general objective of this programme is to produce Information Systems experts; with broad understanding of both the organizational and its computing/engineering needs and who can function effectively as database administrators, business analysts, programmers, network administrators, project managers and computer technicians.

6.2.2 Specific Objectives

By the end of the programme, students should;

4. Be able to demonstrate broad understanding of the strategic use of Information Systems in private organizations, public sector enterprises and non-governmental institutions.
5. Be able to competently use the systems development life cycle along with its appropriate tools, techniques, methodologies, and processes to develop information systems that meet the needs of businesses and organizations.
6. Be able to follow known research methodologies to identify research problems in Information Systems, conduct research and report the findings in standard scientific manner.

6.3 Target Groups and Outcomes

6.3.1 Target Groups

The target group for the Bachelor of Information Systems programme includes but is not limited to:

10. Students who have successfully completed Somaliland General Secondary School Certificate (SGCSE) or its equivalent from a recognized examination body and who wish to pursue a career in information systems.
11. People already working in the field of Information Systems or related fields but would like to add new skills set to their professional work and attain formal certification in Information Systems.
12. Other persons with insight in Information Systems and would like to pursue the challenge of Information Systems at the undergraduate degree level.

6.3.2 Expected Programme Outcomes

The graduates of the Bachelor of Information Systems programme should be persons who are:

7. Consultants and information systems security professionals who assess, evaluate, and communicate key aspects of Information Systems as enablers of modern organisations.
8. Systems administrators with authoritative knowledge of operating systems, networks, and cloud computing systems and ability to securely administer both Windows and Linux systems.
9. Proprietors of their own business initiatives providing consulting services or carrying out qualitative analyses for the design and management of information systems in government organisations and business enterprises of various sizes.
10. Information systems analysts or architects, programmers, testers, database administrators or project managers in private or public organizations.
11. Information security analysts, IS managers and IS security auditors in governmental and non-governmental firms

6.4 Programme Resources

6.4.1 Staff, Facilities and Equipment

The faculty of computing and informatics, and the department of Information Systems have adequate resources to offer this programme. The faculty has three (3) functional and well equipped computer laboratories fitted with over-head digital projectors and 35 work stations. There is free WiFi 24/7 on campus internet connections in all computer laboratories and surrounding areas hosted by two local internet service providers, with a total of 20Mbps download and 20Mbps upload internet speeds. The main university library has an array of information systems materials for further reading, and several electronic books and reference materials on IS are also available through Amoud University Google classroom suite. The faculty

has a well balanced team of highly competent local and non-local staff, trained locally and abroad who are readily available to help students as needs arise. The programme has been allocated sufficient time and with efficient management, the faculty ensures that students complete their courses on time.

6.4.2 Funding

The programme of bachelor of Information Systems is sustained largely by funds from tuition fees and other relevant levies. The student must show proof of ability to pay tuition fees on time before being enrolled into the programme. There are no special funding arrangements for the students enrolled in the programme of bachelor of information systems. However, if and when, additional funds are available, they shall be dispensed according to the university financial policies.

6.5 Course List for Bachelor of Information Systems

The programme for the Bachelor of information systems is fully covered with the following 50 courses. All courses are compulsory.

Course Code	Course Title	CU
FRM 6111:	Introduction to reading	3
FRM 6112:	Introduction to writing	3
FRM 6113:	Introduction to biology	3
FRM 6114:	Arabic language	3
FRM 6115:	Pre-calculus	3
FRM 6121:	English academic writing	3
FRM 6122:	Islamic studies	3
BIS 6121:	Introduction to probability and statistics	3
BIS 6122:	Fundamentals of information technology	3
BIS 6123:	Introduction to physics	3
BIS 6124:	Fundamentals of computer networks	3
BIS 6211:	Introduction to information systems	3
BIS 6212:	Programming methodology (C)	3
BIS 6213:	Web development (HTML/CSS)	3
BIS 6214:	Discrete mathematics	3
BIS 6215:	Multimedia systems and graphics	3
BIS 6216:	Computer applications and maintenance	3
BIS 6217:	Spreadsheet analysis and modeling	3
BIS 6221:	Introduction to software engineering	3
BIS 6222:	Principles of database management systems (Ms Access)	3
BIS 6223:	Network design and implementation	3
BIS 6224:	Object oriented programming I (C++)	3
BIS 6225:	Web applications development (CMS)	3
BIS 6226:	Introduction to data analytics	3
BIS 6227:	Business requirements modelling	3
BIS 6311:	Enterprise architecture	3
BIS 6312:	Enterprise database management system (SQL Server)	3
BIS 6313:	Application programming (VB.NET)	3
BIS 6314:	Client side web development (JavaScript)	3
BIS 6315:	Information systems project management	3
BIS 6316:	Finance and IS professionals	3
BIS 6321:	IT strategy, management and acquisition	3
BIS 6322:	Database programming (Oracle)	3
BIS 6323:	Information security management	3

BIS 6324: Systems analysis and design	3
BIS 6325: Server side web development (PHP/ MySQL)	3
BIS 6326: Object oriented programming II (Java)	3
BIS 6327: Artificial intelligence	3
BIS 6331: Industrial attachment and report	5
BIS 6411: Computer ethics	3
BIS 6412: Cloud computing	3
BIS 6413: Linux/ Unix	3
BIS 6414: Information systems security	3
BIS 6415: IS individual project I (Proposal)	3
BIS 6416: Decision support and expert systems	3
BIS 6421: Network security	3
BIS 6422: Network server administration (Windows server)	3
BIS 6423: Data mining and data warehousing	3
BIS 6424: Systems testing and quality management	3
BIS 6425: IS individual project II (Implementation and report)	3

6.6 Regulations for Bachelor of Information Systems

6.6.1 General Regulations

General University regulations and guidelines for undergraduate programmes shall apply with regard to application, registration, teaching, learning, examinations, research and graduation. A student is required to sign a memorandum of understanding during the registration process on pre-scribed forms.

6.6.2 Admission Requirements

This bachelor of Information Systems programme is best suited to students with interest in becoming future data scientists or big data analysts in business tech firms. To qualify for admission into the degree of bachelor of Information Systems, an applicant shall:

10. Hold a Somaliland GCSE of at least Grade "C", or its equivalent from a recognized examination body.
11. Successfully complete a one-year freshman programme at Amoud University, and attain a GPA of at least 2.00.
12. Meet other conditions as spelt out by the Faculty of Computing and Informatics and the department of Information Systems, with approval of Senate.

6.6.2 Enrolment Types

There shall be three (3) categories of enrolments as follows:

10. Full-Time Day face-to-face enrolled students who shall attend classes between 7.30 am 4.30 pm from Saturday to Thursday.
11. Full-Time Evening face-to-face enrolled students who shall attend classes between 4.00 pm and 10.00 pm from Saturday to Thursday.
12. Sandwich, part-time, and other modes enrolled students who shall attend classes during specific periods as specified by the Faculty of Computing and Informatics and department of Information Systems, and approved by Senate.

6.7 The Curriculum

6.7.1 Programme Duration

The programme run on a semester basis consisting of four semesters each lasting 17 weeks, or part-time basis as appropriately structured by the Faculty of Computing and Informatics and department of Information Systems, and approved by Senate.

6.7.2 Programme Modalities

The programme shall be conducted by course work, examinations and project, based on credit units. The last two weeks of each semester of each academic year shall normally be used for end-of-semester examinations. Further,

10. A student shall take foundation/general courses in English, mathematics, science, Arabic, Islamic studies during the first one year in the freshmen. The freshman year also acts as a gateway to full admission into the bachelor of information systems programme.
11. By the end of junior year, a student shall attend at least 300 hours of internship in a real work environment.
12. A student shall come up with a well-written project in the area of Information Systems during the senior year of study.

6.7.3 Curriculum Plan

The programme shall run on a semester basis consisting of eight (8) semesters each lasting 17 weeks in a period of four (4) academic years, whether on full time, part-time, sandwich, or online or other modes as structured by the Faculty of Computing and Informatics, and department of Information Systems, and approved by Senate.

Freshman semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
FRM 6111	Introduction to reading	45	0	0	0	45	3
FRM 6112	Introduction to writing	45	0	0	0	45	3
FRM 6113	Introduction to biology	45	0	0	0	45	3
FRM 6114	Arabic language	45	0	0	0	45	3
FRM 6115	Pre-calculus	45	0	0	0	45	3
Total		225	0	0	0	225	15
Freshman semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
FRM 6121	English academic writing	45	0	0	0	45	3
FRM 6122	Islamic studies	45	0	0	0	45	3
BIS 6121	Introduction to Probability and statistics	45	0	0	0	45	3
BIS 6122	Fundamentals of information technology	45	0	0	0	45	3
BIS 6123	Introduction to physics	45	0	0	0	45	3
BIS 6124	Fundamentals of computer networks	45	0	0	0	45	3
Total		270	0	0	0	270	18
Sophomore semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BIS 6211	Introduction to information systems	45	0	0	0	45	3
BIS 6212	Programming methodology (C)	30	0	45	0	75	3
BIS 6213	Web development (HTML/CSS)	30	0	45	0	75	3
BIS 6214	Discrete mathematics	45	0	0	0	45	3
BIS 6215	Multimedia systems and graphics	30	0	45	0	75	3
BIS 6216	Computer applications and maintenance	30	0	45	0	75	3
BIS 6217	Spreadsheet analysis and modeling	30	0	45	0	75	3
Total		240	0	225	0	465	21
Sophomore semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BIS 6221	Introduction to software engineering	45	0	0	0	45	3
BIS 6222	Principles of database management systems (Ms Access)	30	0	45	0	75	3
BIS 6223	Network design and implementation	30	0	45	0	75	3
BIS 6224	Object oriented programming I (C++)	30	0	45	0	75	3
BIS 6225	Web applications development (CMS)	30	0	45	0	75	3
BIS 6226	Introduction to data analytics	30	0	45	0	75	3
BIS 6227	Business requirements modelling	45	0	0	0	45	3
Total		240	0	225	0	465	21
Junior semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BIS 6311	Enterprise architecture	45	0	0	0	45	3
BIS 6312	Enterprise database management system (SQL Server)	30	0	45	0	75	3
BIS 6313	Application programming (VB.NET)	30	0	45	0	75	3
BIS 6314	Client side web development (JavaScript)	30	0	45	0	75	3
BIS 6315	Information systems project management	45	0	0	0	45	3
BIS 6316	Finance and IS professionals	45	0	0	0	45	3
Total		225	0	135	0	360	18
Junior semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU

BIS 6321	IT strategy, management and acquisition	45	0	0	0	45	3
BIS 6322	Database programming (Oracle)	30	0	45	0	75	3
BIS 6323	Information security management	45	0	0	0	45	3
BIS 6324	Systems analysis and design	45	0	0	0	45	3
BIS 6325	Server side web development (PHP/ MySQL)	30	0	45	0	75	3
BIS 6326	Object oriented programming II (Java)	30	0	45	0	75	3
BIS 6327	Artificial intelligence	45	0	0	0	45	3
Total		270	0	135	0	405	21
Junior semester III							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BIS 6331	Industrial attachment and report	0	0	0	300	300	5
Total		0	0	0	300	300	5
Senior semester I							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BIS 6411	Computer ethics	45	0	0	0	45	3
BIS 6412	Cloud computing	45	0	0	0	45	3
BIS 6413	Linux/ Unix	30	0	45	0	75	3
BIS 6414	Information systems security	45	0	0	0	45	3
BIS 6415	IS individual project I (Proposal)	45	0	0	0	45	3
BIS 6416	Decision support and expert systems	45	0	0	0	45	3
Total		255	0	45	0	300	18
Senior semester II							
Course Code	Course Title	LH	TH	PH	FH	CH	CU
BIS 6421	Network security	45	0	0	0	45	3
BIS 6422	Network server administration (Windows server)	30	0	45	0	75	3
BIS 6423	Data mining and data warehousing	30	0	45	0	75	3
BIS 6424	Systems testing and quality management	45	0	0	0	45	3
BIS 6425	IS individual project II (Implementation and report)	15	30	0	0	45	2
Total		165	30	90	0	285	14
Grand Total		1890	30	855	300	3075	151