

Al-Zahraa University for Women

جامعة الزهراء (ع) للبنات



First Cycle – Bachelor's degree (B.Sc.) – Cyber Security Engineering

بكالوريوس هندسة - الأمن السيبراني



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1. Overview

This catalogue is about the courses (modules) given by the program of Cyber Security Engineering to gain the Bachelor of Science degree. The program delivers (48) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظرة عامة

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة الأمن السيبراني للحصول على درجة بكالوريوس علوم الهندسة. يقدم البرنامج (48) مادة دراسية، على سبيل المثال، مع (6000) إجمالي ساعات حمل الطالب و 240 إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
CYS101	Structured Programming	7	1
Class (hr/w)	Lect/ <u>Lab</u> ./ <u>Prac</u> ./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	96
Description			
Structured Programming is a programming paradigm that emphasizes the use of modularity, structured control flow, and data abstraction to improve the clarity, maintainability, and scalability of programs. This module introduces the fundamental principles of structured programming using the C++ programming language. Students will learn how to design, write, and debug structured programs to solve computational problems. Throughout the module, students are encouraged to apply problem-solving techniques and develop algorithmic thinking to devise efficient solutions. They also gain hands-on experience through programming assignments and projects. Topics covered include basic syntax and data types, control structures, functions, arrays, pointers, and file handling.			

Module 2

Code	Course/Module Title	ECTS	Semester
ENG101	Electrical Circuits	7	1
Class (hr/w)	Lect/ <u>Lab.</u> / <u>Prac.</u> /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	96
Description			
<p>This module introduces students to the basic principles and concepts of electrical circuits. Students will have a strong foundation in electrical circuit analysis and design. They will be able to apply their knowledge to design and analyze basic circuits, troubleshoot circuit problems, and understand the behavior of electrical components in various circuit configurations, focusing on both DC (direct current) and AC (alternating current) circuits. Topics covered include voltage, current, resistance, Ohm's law, Kirchhoff's laws, circuit elements (such as resistors, capacitors, and inductors), circuit analysis techniques (such as nodal analysis and mesh analysis), circuit theorems (such as thevenin's theorem and Norton's theorem), and frequency response.</p>			

Module 3

Code	Course/Module Title	ECTS	Semester
CYS102	Cybersecurity Fundamentals	5	1
Class (hr/w)	Lect/Lab./Prac. / <u>Tutor</u>	SSWL (hr/sem)	USWL (hr/w)
3	1	63	62
Description			
<p>A cybersecurity fundamental is an introductory module designed to provide students with a comprehensive understanding of the key principles, concepts of conditionality, integrity, and availability in the field of cybersecurity. The module aims to equip students with a foundational knowledge of cybersecurity, including the fundamental principles, tools, and techniques used to protect digital assets and information systems from unauthorized access, data breaches, and cyber threats. Students will explore various topics related to cybersecurity, including threat landscape analysis, risk assessment, network security, cryptography, access controls, incident response, and security awareness. The module emphasizes the importance of a multi-layered defense approach and the implementation of security measures across different levels of an organization's infrastructure.</p>			

Module 4

Code	Course/Module Title	ECTS	Semester
ENG102	Mathematics I	5	1
Class (hr/w)	Lect/Lab./Prac. / <u>Tutor</u>	SSWL (hr/sem)	USWL (hr/w)
3	1	63	62
Description			
<p>This module is designed to develop student's mathematical reasoning and problem-solving abilities. This module introduces students to the fundamental concepts of algebra, geometry, and calculus. It aims to provide students with a solid understanding of mathematical principles and techniques that are essential for further study in mathematics and related disciplines. Throughout the module, students will engage in problem-solving activities, both individually and collaboratively, to develop their critical thinking and analytical skills. Emphasis will be placed on applying mathematical concepts to real-world situations and communicating mathematical ideas effectively.</p>			

Module 5

Code	Course/Module Title	ECTS	Semester
SHU101	Computer Skills	4	1
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	36
Description			
<p>This module provides an introduction to computer skills and essential software applications. Students will develop fundamental computer literacy and gain proficiency in using various software tools for productivity and communication purposes. The module covers topics such as operating systems, word processing, spreadsheets, presentation software, email, and internet usage. Assessment methods may include practical assignments, projects, quizzes, examinations, and class participation. Students are typically expected to complete hands-on exercises using various computer applications and demonstrate their understanding of the module concepts through both individual and collaborative work.</p>			

Module 6

Code	Course/Module Title	ECTS	Semester
SHU102	English Language I	2	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
<p>Academic English I is a foundational module designed to enhance students English language proficiency and develop essential academic skills necessary for successful undergraduate studies. The module focuses on improving students reading, writing, listening, and speaking skills in an academic context. Emphasis is placed on critical thinking, effective communication, and academic integrity. Through various activities and assignments, students will learn to analyze and respond to academic texts, conduct research, and produce well-structured essays.</p>			

Module 7

Code	Course/Module Title	ECTS	Semester
CYS201	Digital Techniques	8	2
Class (hr/w)	Lect/ <u>Lab.</u> / <u>Prac.</u> /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	121
Description			
<p>Digital Techniques is a foundational module that introduces students to the fundamental concepts and principles of digital logic design and its application in system design. This module aims to provide students with a solid understanding of the building blocks of digital systems and the methods used to design, analyze, and optimize them. The module begins by covering the basics of binary number systems, Boolean algebra, and logic gates. Students will learn how to represent and manipulate digital information using binary notation and logical operations. They will gain proficiency in designing and implementing combinational logic circuits, including encoders, decoders, multiplexers, and adders. The module then progresses to sequential logic circuits, focusing on flip-flops, registers, counters, and memory units. Students will explore different types of flip-flops and their applications in designing sequential circuits. They will also learn about clocking, timing analysis, and state diagrams for sequential systems.</p>			

Module 8

Code	Course/Module Title	ECTS	Semester
CYS202	Networking Fundamentals	7	2
Class (hr/w)	Lect/ <u>Lab.</u> / <u>Prac.</u> /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	96
Description			
<p>This module provides with a comprehensive understanding of the basic principles, concepts, and technologies of computer networking. This module serves as an introduction to the field of networking and aims to equip students with the foundational knowledge required to design, implement, and troubleshoot networks. The module combines theoretical knowledge with practical exercises and hands-on activities to reinforce the concepts learned. Students will have opportunities to configure network devices, set up basic networks, analyze network traffic, and troubleshoot network problems using industry-standard tools and techniques. By the end of the module, students should have a solid foundation in networking concepts, enabling them to pursue advanced modules in computer networking or apply their knowledge in various information technology roles involving network administration, network engineering, or systems support.</p>			

Module 9

Code	Course/Module Title	ECTS	Semester
ENG202	Mathematics II	7	2
Class (hr/w)	Lect/Lab./Prac. / <u>Tutor</u>	SSWL (hr/sem)	USWL (hr/w)
3	1	63	112
Description			
<p>This course is provided to further develop students understanding and proficiency in mathematical concepts and techniques. Building upon the foundation established in Mathematics I, this course expands upon various mathematical topics and introduces new areas of study. Throughout the course, students are encouraged to develop problem-solving skills, critical thinking, and logical reasoning abilities. The course may incorporate a combination of lectures, discussions, problem-solving sessions, and assignments to reinforce understanding and application of the concepts.</p>			

Module 10

Code	Course/Module Title	ECTS	Semester
ENG201	Engineering Drawing	4	2
Class (hr/w)	Lect/ <u>Lab./Prac.</u> /Tutor	SSWL (hr/sem)	USWL (hr/w)
-	3/1	62	38
Description			
<p>The module is designed to provide students with the necessary skills and knowledge to create technical drawings using computer-aided design (CAD) software. The module combines principles of engineering drawing with practical hands-on experience in using CAD tools to produce accurate and detailed engineering drawings. The module begins with an introduction to the fundamentals of engineering drawing, including projection methods, geometric construction, dimensioning, and tolerancing. Students will learn the principles of orthographic projection, isometric drawing, and auxiliary views to represent three-dimensional objects on a two-dimensional plane. Once the foundational concepts are covered, the module transitions to the use of CAD software as a tool for creating and modifying engineering drawings. Students will learn how to navigate the CAD interface, create and edit basic shapes, apply dimensions and annotations, and organize drawing sheets. Emphasis is placed on understanding the capabilities and limitations of CAD software and developing proficiency in using the tools effectively.</p>			

Module 11

Code	Course/Module Title	ECTS	Semester
SHU201	Democracy and Human Rights	2	2
Class (hr/w)	Lect/Lab./Prac. / <u>Tutor</u>	SSWL (hr/sem)	USWL (hr/w)
1	1	33	17
Description			
<p>يقدم مقرر الديمقراطية وحقوق الانسان للطلاب مبادئ الديمقراطية والتطرق الى مفهومها ومعرفة الاسس التي تعني في الحكم والجدور التاريخية لها من خصائص (المكونات، المميزات، الضمانات) كما ويتطرق المقرر الى مفهوم الدستور، مؤسسات المجتمع المدني، الانتخابات المعاصر. بالاضافة الى ذلك يتناول المقرر مبادئ و ميثاق الأمم المتحدة في اعلانها للقضاء علي جميع أشكال التمييز العنصري، حيث أكدت على مبادئ كرامة جميع البشر وتساويهم، وأن من الأهداف الأساسية التي ينشدها هو تحقيق التعاون الدولي لتعزيز وتشجيع احترام حقوق الإنسان والحريات الأساسية للناس جميعاً دون تمييز بسبب العرق أو الجنس أو اللغة أو الدين. وأن التمييز بين البشر بسبب العرق أو اللون أو الأصل الاتني إهانة للكرامة الإنسانية، ويجب أن يدان باعتباره إنكاراً لمبادئ ميثاق الأمم المتحدة، وانتهاكاً لحقوق الإنسان وللحريات الأساسية المعلنة في الإعلان العالمي لحقوق الإنسان، وعقبة دون قيام علاقات ودية وسلمية بين الأمم، وواقعا من شأنه تعكير السلم والأمن بين الشعوب.</p>			

Module 12

Code	Course/Module Title	ECTS	Semester
SHU202	Arabic Language	2	2
Class (hr/w)	Lect/Lab./Prac. / <u>Tutor</u>	SSWL (hr/sem)	USWL (hr/w)
1	1	33	17
Description			
<p>يقدم هذا المقرر للطلبة التعليم بأساسيات اللغة العربية، والبحث في تعليم المهارات اللغوية وتطبيقها في المخاطبات اليومية والرسمية، وكذلك التعامل على اساس الاقتباس ثم التعلم بهدف تطوير القابلية الذهنية للطلاب وتنمية قدرة الطالب على اتقان اللغة وتحليل ظواهر الكلام وايضا تمكين الطلبة من تحسين المهارات النقاشية وتنمية وتطوير المهارات الابداعية والتفكيرية والقدرة على التحليل والفهم والاستنباط في المجالات اللغوية والأدبية. ويتناول المقرر فهم بعض قواعد اللغة عند الكتابة والتعبير الشفوي والتحرى ويهدف المقرر الى تقوية مهارات الطلبة في الحفظ والتذكر واسترجاع المعلومات من خلال تدريبهم على اكتشاف الخطاء والقدرة على تقويم انفسهم ذاتياً وتصويبها واستعمال الالفاظ والجمل استعمالاً صحيحاً من غير تكلف وجهد.</p>			

Module 13

Code	Course/Module Title	ECTS	Semester
CYS301	Cybersecurity Python Programming I	6	3
Class (hr/w)	Lect/ <u>Lab./Prac.</u> /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	71
Description			
<p>The module is designed to introduce students to the fundamental concepts and principles of the Python programming language. This module serves as a comprehensive foundation for individuals who are new to programming or have limited programming experience. Throughout the module, students will develop a strong understanding of Python's syntax, data types, control structures, and functions. They will also gain hands-on experience in writing Python code, solving problems, and building small-scale applications. By the end of the module, students will have a solid foundation in Python programming and will be able to independently write and execute Python code to solve real-world problems. They also possess the necessary skills and prepare them to pursue more advanced topics in Python programming or specialize in specific application areas.</p>			

Module 14

Code	Course/Module Title	ECTS	Semester
CYS302	Introduction to Cryptography	6	3
Class (hr/w)	Lect/ <u>Lab./Prac.</u> /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	71
Description			
<p>This module provides a comprehensive overview of the principles, techniques, and applications of cryptography. Cryptography is the science of securing information and communication in the presence of adversaries. This module introduces students to the fundamental concepts and mathematical tools used in modern cryptography and explores their practical implementations. The module begins by establishing a solid understanding of classical cryptography, including historical ciphers and their vulnerabilities. Students will learn about substitution ciphers, transposition ciphers, and their weaknesses. Through analysis and decryption exercises, students will gain insights into the importance of key management and the necessity for more robust encryption techniques. Building upon the foundation of classical cryptography, the module delves into modern cryptographic systems. Students will explore symmetric key encryption algorithms, such as the Data Encryption Standard (DES), and stream ciphers. The principles of confidentiality, integrity, and authenticity will be emphasized, along with the concept of secure key exchange and key distribution mechanisms.</p>			

Module 15

Code	Course/Module Title	ECTS	Semester
CYS303	Data Communications and Computer Networks	6	3
Class (hr/w)	Lect/Lab./Prac. / <u>Tutor</u>	SSWL (hr/sem)	USWL (hr/w)
3	1	63	87
Description			
<p>This module explores the principles, technologies, and protocols used in the field of computer networking. The module provides a comprehensive understanding of how data is transmitted and communicated between devices in modern computer networks. The module covers a wide range of topics, starting with an introduction to basic concepts and terminology related to computer networks. It then delves into various network architectures, including local area networks (LANs), wide area networks (WANs), and the Internet. Students will learn about network topologies, network protocols, and network devices such as routers, switches, and firewalls. The module emphasizes the principles and protocols used for data communication across networks. Topics include the TCP/IP protocol suite, IP addressing, subnetting, routing algorithms, and transport layer protocols such as TCP and UDP. Students will gain practical knowledge of configuring and troubleshooting network devices and protocols.</p>			

Module 16

Code	Course/Module Title	ECTS	Semester
CYS304	Web Application Programming	6	3
Class (hr/w)	Lect/ <u>Lab./Prac.</u> /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	71
Description			
<p>This module provides an introduction to the fundamental concepts and techniques of web programming. Students will learn the basics of web development, including HTML, CSS, and PHP, and gain an understanding of how these technologies are used to create interactive and dynamic web applications. The module covers essential topics such as web design principles, client-server architecture, data handling, and user interface development. Through hands-on projects and exercises, students will develop practical skills in web programming and gain the ability to build simple web and dynamic web applications.</p>			

Module 17

Code	Course/Module Title	ECTS	Semester
CYS305	Probability and Statistics	4	3
Class (hr/w)	Lect/Lab./Prac. / <u>Tutor</u>	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
<p>This module is an introductory that provides a comprehensive understanding of the fundamental concepts and techniques used in the field of probability theory and statistical analysis. The module aims to develop students' ability to analyze and interpret data, make informed decisions based on statistical evidence, and understand the inherent uncertainty in various real-world phenomena. The module begins with an exploration of probability theory, focusing on the fundamental principles of probability, such as sample spaces, events, and probability distributions. Various probability models, such as discrete and continuous distributions, are introduced to analyze random variables and their properties. Building upon the foundation of probability theory, the module delves into statistical concepts and methods. Students learn about descriptive statistics, which involve organizing, summarizing, and presenting data using measures such as mean, median, mode, and standard deviation. Inferential statistics is also covered, emphasizing the estimation of population parameters and hypothesis testing. Students gain proficiency in selecting appropriate statistical techniques for different scenarios and interpreting the results.</p>			

Module 18

Code	Course/Module Title	ECTS	Semester
CYS306	English Language II	2	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
<p>Academic English Part II is a continuation of the Academic English Part I module, designed to provide non-native English speakers with advanced language skills necessary for academic success. The module aims to develop student's proficiency in academic reading, writing, speaking, and listening. Topics covered in this module may include Advanced academic vocabulary and idiomatic expressions Academic writing conventions, including essay structure, coherence, and cohesion Reading and analyzing academic texts, including research articles and scholarly publications Effective note-taking strategies during lectures and discussions developing, critical thinking skills, and analyzing arguments conducting research. Throughout the module, students will engage in various activities, such as reading and analyzing academic texts, writing essays and research papers, participating in class discussions, and giving presentations. Emphasis will be placed on improving grammatical accuracy, vocabulary usage, and overall communication skills in an academic setting.</p>			

Module 19

Code	Course/Module Title	ECTS	Semester
CYS401	Cybersecurity Python Programming II	6	4
Class (hr/w)	Lect/ <u>Lab.</u> / <u>Prac.</u> /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	71
Description			
<p>This module is designed to provide students with an in-depth understanding of Python programming techniques and their practical applications in the field of cybersecurity. Throughout the module, students will develop a strong understanding of Python's syntax in object-oriented programming (OOP) concepts. It builds upon foundational Python skills and focuses on advanced topics and tools used in various cybersecurity domains. Students will gain hands-on experience by working on real-world projects and exercises, enhancing their proficiency in Python programming while developing a solid foundation in cybersecurity. By the end of this module, students will have gained a solid foundation in advanced Python programming techniques specific to the field of cybersecurity. They will be equipped with practical skills and knowledge necessary to develop effective cybersecurity solutions, automate security tasks, and analyze data to detect and respond to threats.</p>			

Module 20

Code	Course/Module Title	ECTS	Semester
CYS402	Advanced Cryptography	6	4
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
<p>This module provides an in-depth exploration of advanced concepts and techniques in the field of cryptography. Building upon the foundational knowledge acquired in introductory cryptography modules, this advanced module focuses on the theoretical and practical aspects of designing and analyzing secure cryptographic systems. Throughout the module, students will delve into advanced cryptographic algorithms, protocols, and applications such as Block ciphers (e.g., AES, DES), Stream ciphers (e.g., RC4), Asymmetric (public-key) cryptography (RSA cryptosystem), Elliptic curve cryptography (ECC) Diffie-Hellman key exchange, and Digital signatures and certificates, while developing a deeper understanding of their underlying mathematical principles. The module aims to equip students with the knowledge and skills necessary to analyze, design, and implement secure cryptographic solutions in various domains.</p>			

Module 21

Code	Course/Module Title	ECTS	Semester
CYS403	Database Security	5	4
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
<p>This module provides an introduction to the fundamental concepts and principles of database systems and database security. Students will learn the theoretical foundations of databases, as well as gain practical experience in designing, implementing, and querying databases. Topics covered include data modeling, relational algebra, SQL, database design principles, normalization, transaction management, and data integrity. In addition, Database Security is an advanced module that explores the principles, techniques, and best practices for securing databases against unauthorized access, data breaches, and other security threats. In today's data-driven world, where sensitive information is stored and accessed through databases, it is crucial to understand the concepts and strategies for protecting the integrity, confidentiality, and availability of data. This module delves into various aspects of database security, including both theoretical foundations and practical implementations. Students will gain a comprehensive understanding of the potential vulnerabilities and risks associated with database systems and learn effective strategies to mitigate these risks.</p>			

Module 22

Code	Course/Module Title	ECTS	Semester
CYS404	Operating Systems	5	4
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
<p>This module is designed to explore the fundamental concepts, principles, and mechanisms underlying modern operating systems. It offers a comprehensive understanding of how operating systems manage computer hardware resources and facilitate the execution of software programs. Throughout the module, students delve into various aspects of operating systems, including process management, memory management; file systems, input/output systems, and device management. They learn about the critical role an operating system plays in providing a stable and efficient environment for running applications. Students gain insights into the structure and functions of operating systems, studying topics such as process creation, scheduling, synchronization, and inter-process communication. They explore different process models and scheduling algorithms, assessing their strengths and weaknesses. Memory management is another significant area covered in the module. Students learn about memory hierarchy, virtual memory, paging, segmentation, and memory allocation strategies. They examine techniques for efficient memory utilization, including demand paging and page replacement algorithms.</p>			

Module 23

Code	Course/Module Title	ECTS	Semester
CYS405	Data Structures and Algorithms	4	4
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	36
Description			
<p>This module is designed to introduce various data structures and algorithms used to solve complex problems and improve the performance of software applications. The module begins with an overview of basic data structures, such as arrays, linked lists, stacks, queues, and trees. Students learn about the characteristics, advantages, and limitations of each data structure, as well as their implementation details. They gain a solid understanding of how data is organized and accessed in memory. Once the foundational data structures are covered, the module delves into algorithm design and analysis. Students learn different algorithmic paradigms, including brute-force algorithms, divide-and-conquer, greedy algorithms, and dynamic programming. They study techniques for algorithm analysis, including time and space complexity, and learn how to evaluate and compare the efficiency of different algorithms. Throughout the module, students are exposed to a wide range of algorithms for sorting, searching, graph traversal, and more. They gain insights into algorithmic problem-solving strategies and learn how to select appropriate data structures and algorithms for specific problem domains.</p>			

Module 24

Code	Course/Module Title	ECTS	Semester
CYS406	Malicious Software Analysis	4	4
Class (hr/w)	Lect/Lab./Prac. / <u>Tutor</u>	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
<p>Malicious Software Analysis is an advanced module that delves into the analysis, detection, and mitigation of malicious software, also known as malware. The module provides students with the knowledge and practical skills required to understand, analyze, and combat various forms of malware that pose threats to computer systems and networks. Throughout the module, students will explore the fundamental concepts of malware, including its classification, propagation techniques, and behavior patterns. They will learn how to identify and analyze different types of malwares, such as viruses, worms, Trojans, rootkits, ransomware, and botnets. The module emphasizes both static and dynamic analysis techniques, enabling students to examine malware samples using various tools, techniques, and platforms. The module combines theoretical knowledge, where students gain real-world experience in analyzing and combating malware. By the end of the module, students will be equipped with the necessary skills to analyze, detect, and respond to malicious software, contributing to the protection of computer systems and networks in various sectors, including cybersecurity, law enforcement, and information technology.</p>			

Module 25

Code	Course/Module Title	ECTS	Semester
CYS501	Operating Systems Security	6	5
Class (hr/w)	Lect/ <u>Lab.</u> /Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
<p>The module focuses on the principles, techniques, and practices employed to secure computer operating systems. It explores the vulnerabilities and threats that can affect operating systems and provides strategies to mitigate them. The module typically covers the following topics: Introduction to Operating Systems Security: An overview of operating systems and their security requirements, Security Principles and Concepts: Exploration of fundamental security principles, such as confidentiality, integrity, availability, and accountability. Threats and Attacks: Identification and analysis of common threats and attacks targeting operating systems, Access Control and Authorization: Study of access control mechanisms employed by operating systems to enforce security policies, Vulnerability Assessment and Patch Management: Techniques for identifying vulnerabilities in operating systems, Vulnerability Assessment and Patch Management: Techniques for identifying vulnerabilities in operating systems, Secure System Administration: Best practices for system administration to enhance the security of operating systems.</p>			

Module 26

Code	Course/Module Title	ECTS	Semester
CYS502	Web Programming Security	6	5
Class (hr/w)	Lect/ <u>Lab.</u> / <u>Prac.</u> /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	71
Description			
<p>This course provides an introduction to the fundamental concepts and techniques of web programming. Students will learn the basics of web development, including HTML, CSS, and PHP, and gain an understanding of how these technologies are used to create interactive and dynamic web applications. The course covers essential topics such as web design principles, client-server architecture, data handling, and user interface development. Through hands-on projects and exercises, students will develop practical skills in web programming and gain the ability to build simple web and dynamic web applications.</p>			

Module 27

Code	Course/Module Title	ECTS	Semester
CYS503	Artificial Intelligence in Cybersecurity	6	5
Class (hr/w)	Lect/ <u>Lab.</u> / <u>Prac.</u> /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	71
Description			
<p>Artificial Intelligence (AI) has emerged as a powerful tool in addressing the evolving challenges of cybersecurity. This module aims to provide students with a comprehensive understanding of how AI techniques and algorithms can be applied to enhance the security and resilience of computer systems, networks, and digital assets. The module will cover fundamental concepts of artificial intelligence and machine learning, and their specific applications in the field of cybersecurity. Students will explore various AI-driven approaches used for threat detection, anomaly detection, intrusion detection and prevention, malware analysis, vulnerability assessment, and security analytics. Throughout the module, students will have the opportunity to engage in hands-on activities, lab exercises, and case studies to reinforce their understanding of AI techniques in cybersecurity. By the end of the module, students will be equipped with the knowledge and skills necessary to leverage artificial intelligence effectively in various cybersecurity contexts, enabling them to proactively identify and mitigate security threats in today's complex digital environments.</p>			

Module 28

Code	Course/Module Title	ECTS	Semester
CYS504	Mobile Computing	5	5
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
<p>Mobile Computing is a subject that explores the design, development, and deployment of software applications and systems for mobile devices. In this module, students learn about the unique characteristics and challenges associated with mobile computing and gain practical skills to develop mobile applications across various platforms such as smartphones, tablets, wearables, and other portable devices. The module provides a comprehensive overview of the fundamental concepts, technologies, and frameworks used in mobile computing. Throughout the module, students are typically expected to work on hands-on projects, developing mobile applications that demonstrate their understanding of the concepts and technologies covered. Emphasis is placed on addressing real-world challenges and considering user experience in the design and development process. By the end of the module, students should have a solid foundation in mobile computing, enabling them to develop innovative and user-friendly applications for a wide range of mobile devices and platforms.</p>			

Module 29

Code	Course/Module Title	ECTS	Semester
CYS505	Wireless Technology	5	5
Class (hr/w)	Lect/Lab./Prac. / <u>Tutor</u>	SSWL (hr/sem)	USWL (hr/w)
3	1	63	62
Description			
<p>The module on Wireless Technology provides a comprehensive overview of the principles, technologies, and applications of wireless communication systems. It explores the fundamental concepts, design considerations, and implementation techniques involved in wireless networks, protocols, and devices. The module delves into both theoretical foundations and practical aspects of wireless technology, equipping students with the necessary knowledge and skills to understand, design, and troubleshoot wireless systems. The module on Wireless Technology is typically offered as a semester-long module in a classroom or online setting. It combines lectures, discussions, and practical demonstrations to provide a comprehensive learning experience. Students may be required to complete individual or group projects, assignments, and examinations to assess their understanding of the subject matter.</p>			

Module 30

Code	Course/Module Title	ECTS	Semester
CYS506	English Language III	2	5
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
<p>Academic English Part III is an advanced-level module designed to equip students with the necessary language skills to succeed in academic settings. The module aims to develop proficiency in academic reading, writing, listening, and speaking in English. Students will engage in a variety of activities and assignments to enhance their understanding of academic texts, improve their critical thinking abilities, and refine their written and oral communication skills. Emphasis will be placed on academic vocabulary, grammar, organization, and style. By the end of the module, students will be able to effectively engage with complex academic materials, produce coherent and well-structured essays, deliver presentations, and participate in academic discussions.</p>			

Module 31

Code	Course/Module Title	ECTS	Semester
CYS601	Network Security	6	6
Class (hr/w)	Lect/Lab./Prac. / <u>Tutor</u>	SSWL (hr/sem)	USWL (hr/w)
3	1	63	87
Description			
<p>Network Security is a specialized subject that focuses on the protection and integrity of computer networks, systems, and data from unauthorized access, attacks, and other potential threats. This module aims to provide students with a comprehensive understanding of the principles, techniques, and best practices employed in securing network infrastructure. Throughout the module, students will delve into various aspects of network security. Throughout the module, practical exercises, case studies, and hands-on lab sessions may be included to provide students with real-world experience in securing networks. By the end of the module, students should be equipped with the skills necessary to analyze, design, and implement secure network architectures and effectively mitigate network security risks.</p>			

Module 32

Code	Course/Module Title	ECTS	Semester
CYS602	Intrusion Detection and Prevention Systems	6	6
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
<p>This module provides a comprehensive understanding of Intrusion Detection and Prevention Systems (IDPS) and equips students with the knowledge and skills necessary to design, implement, and manage effective intrusion detection and prevention strategies. The module begins by introducing the fundamental concepts of network security, including common threats, vulnerabilities, and attack vectors. Students learn about the different types of intrusions and the methodologies employed by attackers to compromise systems. The module then delves into the principles and mechanisms of intrusion detection systems (IDS) and intrusion prevention systems (IPS). Students explore various detection techniques, such as signature-based detection, anomaly-based detection, and behavior-based detection. Throughout the module, practical hands-on exercises and case studies are employed to reinforce theoretical knowledge. Students engage in activities such as configuring and managing IDPS systems, analyzing network traffic for identifying potential threats, and responding to security incidents. By the end of the module, students should possess the skills necessary to design, implement, and manage intrusion detection and prevention systems effectively. They should be able to assess the security posture of a network, detect and respond to various types of intrusions, and develop strategies to mitigate emerging threats.</p>			

Module 33

Code	Course/Module Title	ECTS	Semester
CYS603	Wireless Networks Security	5	6
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
<p>Wireless Networks Security is an advanced module that explores the principles, protocols, and technologies involved in securing wireless networks. The module provides a comprehensive overview of the security challenges faced by wireless networks and equips students with the knowledge and skills necessary to design, implement, and manage secure wireless networks. The module will be delivered through a combination of lectures, discussions, hands-on lab exercises, case studies, and guest lectures from industry experts. Students will have the opportunity to gain practical experience by working with wireless network security tools and performing security assessments on simulated wireless network environments. Students will be assessed through a variety of methods, including exams, assignments, lab reports, group projects, and class participation. The module may also include a final project where students design and implement a secure wireless network solution.</p>			

Module 34

Code	Course/Module Title	ECTS	Semester
CYS604	Java Script Programming	5	6
Class (hr/w)	Lect/ <u>Lab.</u> / <u>Prac.</u> /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	46
Description			
<p>JavaScript Programming is an introductory module designed to provide students with a comprehensive understanding of the JavaScript programming language and its applications. The module covers the fundamental concepts, syntax, and techniques required to develop interactive and dynamic web applications. Throughout the module, students will learn the essential building blocks of JavaScript, including variables, data types, control structures, functions, and objects. They will gain hands-on experience in writing JavaScript code and learn how to integrate it with HTML and CSS to create interactive web pages. The module emphasizes practical programming skills and problem-solving techniques, enabling students to build real-world web applications. Students will also be introduced to popular JavaScript libraries and frameworks that enhance web development capabilities. By the end of the module, students will have been able to create interactive web applications.</p>			

Module 35

Code	Course/Module Title	ECTS	Semester
CYS605	Internet of Things Security	4	6
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
3		48	52
Description			
<p>The module "Internet of Things Security" provides an in-depth exploration of the security challenges and solutions associated with the rapidly evolving field of Internet of Things (IoT). As the number of interconnected devices continues to grow, ensuring the security and privacy of these devices and the data they generate has become paramount. This module introduces students to the fundamental concepts, principles, and techniques of IoT security. Throughout the module, students will engage in case studies, and hands-on to reinforce theoretical concepts and develop practical skills in securing IoT systems. By the end of the module, students will be equipped with a comprehensive understanding of IoT security principles, techniques, and industry best practices.</p>			

Module 36

Code	Course/Module Title	ECTS	Semester
CYS606	Social Networks Security	4	6
Class (hr/w)	Lect/Lab./Prac. / <u>Tutor</u>	SSWL (hr/sem)	USWL (hr/w)
3	1	63	37
Description			
<p>This module is designed to provide an in-depth exploration of the security challenges and threats associated with social networking platforms. Social networks have become an integral part of our daily lives, connecting individuals, businesses, and organizations worldwide. However, the widespread use of social networks also introduces vulnerabilities and risks that can compromise privacy, lead to identity theft, and enable various forms of cyber-attacks. This module aims to equip students with the knowledge and skills necessary to understand, analyze, and mitigate the security risks inherent in social networking environments. Throughout the module, students will engage in hands-on activities and case studies to reinforce their understanding of social network security concepts. They will also explore emerging trends and challenges in the field and evaluate the effectiveness of existing security measures. By the end of the module, students will have a comprehensive understanding of the security risks associated with social networks, be able to assess vulnerabilities to protect individuals and organizations from social network-based threats.</p>			

Module 37

Code	Course/Module Title	ECTS	Semester
CYS701	Penetration Testing	6	7
Class (hr/w)	Lect/ <u>Lab./Prac.</u> /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	71
Description			
<p>This module is designed to provide students with an in-depth understanding of the principles, methodologies, and techniques involved in conducting effective penetration tests on computer systems, networks, and applications. Penetration testing, also known as ethical hacking, is a crucial component of ensuring the security and resilience of modern information systems. Throughout the module, students will acquire practical skills and theoretical knowledge necessary to perform systematic security assessments, identify vulnerabilities, and exploit them in a controlled and ethical manner. The module will include a combination of lectures, hands-on lab exercises, and practical assignments. Additionally, ethical and legal considerations will be emphasized throughout the module to ensure responsible and ethical conduct in penetration testing activities. By the end of the module, students will have developed the skills and knowledge necessary to perform penetration tests effectively, identify vulnerabilities, and recommend appropriate security measures to enhance the overall security posture of computer systems, networks, and applications.</p>			

Module 38

Code	Course/Module Title	ECTS	Semester
CYS702	Servers Security	6	7
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
<p>Server Security is an advanced-level module designed to provide students with a comprehensive understanding of the principles, techniques, and best practices for securing server environments. In today's interconnected world, servers play a critical role in storing and processing sensitive data, making them prime targets for various security threats. This module aims to equip students with the knowledge and skills necessary to protect servers from unauthorized access, data breaches, malware infections, and other security risks. The module will be assessed through a combination of assignments, practical labs, quizzes, and a final examination. The assignments and labs will provide hands-on experience in implementing server security measures, while the quizzes and final examination will test students understanding of theoretical concepts.</p>			

Module 39

Code	Course/Module Title	ECTS	Semester
CYS703	Ethical Hacking	6	7
Class (hr/w)	Lect/ <u>Lab</u> ./ <u>Prac</u> . /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/1	79	71
Description			
<p>Ethical Hacking is a specialized subject that focuses on the practice of identifying vulnerabilities and weaknesses in computer systems and networks. This module is designed to provide students with a comprehensive understanding of the tools, techniques, and methodologies employed by ethical hackers to assess the security posture of an organization's information systems. Throughout the module, students will learn about the legal and ethical considerations surrounding hacking activities, emphasizing responsible and lawful practices. They will explore various attack vectors, such as network exploitation, web application vulnerabilities, social engineering, wireless security, and more. The module aims to equip students with the knowledge and skills necessary to effectively assess the security of computer systems, identify potential threats, and recommend appropriate safeguards. The module typically combines theoretical lectures with hands-on practical exercises, enabling students to apply their knowledge in a controlled environment. It fosters a proactive mindset, encouraging students to think like hackers while emphasizing the importance of ethical conduct and responsible use of acquired skills.</p>			

Module 40

Code	Course/Module Title	ECTS	Semester
CYS704	Cloud Computing Security	6	7
Class (hr/w)	Lect/Lab./Prac. / <u>Tutor</u>	SSWL (hr/sem)	USWL (hr/w)
2	1	48	102
Description			
<p>Cloud Computing Security is an advanced-level module that provides students with an in-depth understanding of the security challenges and solutions related to cloud computing environments. This module introduces students to the fundamentals of cloud computing, including the concepts, technologies, The module focuses on the unique security considerations and best practices necessary for securing data, applications, and infrastructure in the cloud. Students will learn about the architecture, deployment models, service models, and security considerations of cloud computing. Throughout the module, students will explore various aspects of cloud computing security, including authentication, access control, data privacy, encryption, network security, virtualization security, and incident response. The module will be delivered through a combination of lectures, discussions, and case studies. Students will have the opportunity to engage in group projects and practical assignments to apply their knowledge in a simulated cloud environment.</p>			

Module 41

Code	Course/Module Title	ECTS	Semester
CYS705	English Language IV	2	7
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
<p>Academic English Part IV is likely an advanced-level module designed to enhance students' proficiency in English for academic purposes. It is typically intended for non-native English speakers who are already familiar with the basics of academic writing, reading, listening, and speaking skills. The module aims to further develop and refine these skills to enable students to excel in academic settings, such as universities or professional environments. The module may cover a range of topics, including Advanced academic writing, Critical reading and analysis, Academic listening and note-taking, Academic speaking and presentation skills, and Research skills and referencing. Throughout the module, there may be opportunities for practice through assignments, group discussions, presentations, and written projects. The module may also emphasize the development of critical thinking, independent learning, and academic integrity.</p>			

Module 42

Code	Course/Module Title	ECTS	Semester
ENG701	Graduate Project I	4	7
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
-	4	62	38
Description			
<p>Preparatory studies of literature and data collection for the graduation project in a particular area of concentration and under the supervision of one of the faculty members. The course covers directed readings in the literature of cybersecurity engineering, introduction to research methods, seminar discussions dealing with special engineering topics of current interest. Planning, design, construction, and management of an engineering project. In the final the student writing a technical report contains the theoretical background and practical side.</p>			

Module 43

Code	Course/Module Title	ECTS	Semester
CYS801	Information Technology Security Management	6	8
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
<p>Information Technology Security Management is a comprehensive module designed to provide students with the knowledge and skills necessary to protect and secure information systems within organizations. The module focuses on understanding the principles, practices, and tools used in the field of IT security management. This module typically combines theoretical concepts with practical exercises, case studies, and hands-on labs to provide students with a well-rounded understanding of IT security management. Students will develop skills in risk analysis, security planning, and incident response, preparing them for careers in cybersecurity and information technology management.</p>			

Module 44

Code	Course/Module Title	ECTS	Semester
CYS802	Digital Forensics	5	8
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
<p>Digital Forensics is a specialized field of study that focuses on the identification, preservation, analysis, and presentation of digital evidence in legal and investigative contexts. This module provides an in-depth exploration of the principles, techniques, and tools used in digital forensics to uncover and analyze electronic data for the purpose of solving cybercrimes, conducting internal investigations, and supporting legal proceedings. Throughout the module, students will engage in hands-on exercises, case studies, and simulations to develop their technical skills and critical thinking abilities. They will learn how to identify potential sources of digital evidence, apply forensically sound procedures to gather and analyze data, and present their findings in a clear and concise manner. Additionally, students will gain an understanding of the challenges and emerging trends in digital forensics, such as encryption, cloud computing, and mobile device forensics. By the end of the module, students will have a solid foundation in digital forensics, enabling them to effectively investigate cyber incidents, prevent future attacks, and contribute to the field of cybersecurity and law enforcement.</p>			

Module 45

Code	Course/Module Title	ECTS	Semester
CYS803	Multimedia Security	5	8
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
<p>Multimedia Security is an advanced module that explores the principles, techniques, and challenges involved in protecting multimedia data from unauthorized access, modification, and distribution. With the increasing use of digital media such as images, audio, video, and other multimedia content, ensuring the security of these assets has become crucial. The module begins by introducing the fundamental concepts of multimedia, including the basic principles, techniques, and technologies involved in multimedia above systems. Students will gain an understanding of the potential threats and attacks that can compromise the integrity, confidentiality, and authenticity of multimedia assets. Throughout the module, students will delve into various topics related to multimedia security, including encryption algorithms and techniques specifically designed for multimedia data. They will explore different methods for watermarking and steganography to embed and extract hidden information within multimedia files, enabling copyright protection and content authentication.</p>			

Module 46

Code	Course/Module Title	ECTS	Semester
CYS804	Intelligent Applications Security	5	8
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
<p>Intelligent Applications Security is an advanced module that focuses on the principles, techniques, and best practices for securing intelligent applications. As organizations increasingly leverage artificial intelligence (AI) and machine learning (ML) technologies to power their applications, ensuring the security of these intelligent systems becomes crucial. This module provides students with a comprehensive understanding of the unique security challenges associated with intelligent applications and equips them with the knowledge and skills to develop robust security measures. It explores the fundamental concepts and methodologies used to secure AI-powered systems, including data privacy, model security, adversarial attacks, and secure deployment. Throughout the module, students will engage in practical exercises, case studies, and hands-on projects to apply the concepts learned. They will develop a solid understanding of the security challenges unique to intelligent applications and gain the skills necessary to design, implement, and maintain secure AI systems.</p>			

Module 47

Code	Course/Module Title	ECTS	Semester
CYS805	Risk Management and Incident Response	5	8
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
<p>This module is designed to provide students with the knowledge and skills necessary to identify, assess, and mitigate risks in organizational settings. The module focuses on understanding the fundamentals of risk management and developing effective incident response strategies to minimize the impact of potential incidents. The module begins by introducing the concept of risk management, exploring different types of risks that organizations face, and discussing the importance of proactive risk identification and assessment. Students will learn how to perform risk assessments, evaluate the potential impact of risks, and prioritize risks based on their likelihood and severity. The second part of the module delves into incident response, covering the key components and best practices of incident management. Students will gain a deep understanding of incident detection, analysis, containment, eradication, and recovery. They will also learn about incident response planning, incident reporting, and the importance of communication and coordination during a crisis.</p>			

Module 48

Code	Course/Module Title	ECTS	Semester
ENG801	Graduate Project II	4	8
Class (hr/w)	Lect/ <u>Lab</u> ./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
-	4	62	38
Description			
<p>Preparatory studies of literature and data collection for the graduation project in a particular area of concentration and under the supervision of one of the faculty members. The course covers directed readings in the literature of cybersecurity engineering, introduction to research methods, seminar discussions dealing with special engineering topics of current interest. Planning, design, construction, and management of an engineering project. In the final the student writing a technical report contains the theoretical background and practical side.</p>			

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