



Arab Academy for Science, Technology and Maritime Transport

Undergraduate Programs

Volume III

**College of Computing and
Information Technology**

Bachelor of Cybersecurity

2024

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Program Vision and Mission

Vision

The College of Computing and Information Technology (CCIT) at AASTMT aspires to be a leading and distinguished educational and training hub as well as a pioneer in the state-of-the-art scientific research in its fields of specialization. Consequently, CCIT envisions forging sustainable solid ties with the computing industry on the national, regional, and international levels.

Mission

The College of Computing and Information Technology (CCIT) aims to graduate calibers with the required solid background and practical skills to enable them to impact and develop their business, profession, and community. In addition, CCIT prepares graduates to innovate and contribute to scientific research on the national, regional, and international levels. Furthermore, CCIT seeks to promote high quality training and consultation services to meet the community needs. This is achieved through continuous development and enhancement of educational and training programs, and scientific research that are hinged on a comprehensive quality assurance framework. Thus, culminating in well-qualified heavily recruited graduates who adhere to professional and ethical values.

Chapter

1

1. INTRODUCTION

Due the evolution in the field of Computing and Information Technology and the increasing reliance on it by individuals, organizations, and businesses, this modern science has become crucial and a cornerstone in all modern life aspects. Therefore, AASTMT has established the College of Computing and Information Technology (CCIT) in 2003, which specializes in Computer Science, Information Systems, Software Engineering, Multimedia and Computer Graphics. However, the roots of the college extend back to 2001, when the Computer Science Department started to offer its program through the Computer Engineering Department as part of the College of Engineering and Technology, AASTMT.

The CCIT aims to develop a generation of computing professionals that could harness innovation with creativity through state-of-the-art facilities, top notch faculty, internationally accredited educational programs, training opportunities and capacity building programs. Our students are inspired to formulate innovative diverse computing solutions for real-world problems to become the next generation of entrepreneurs or be well qualified to secure competitive local, regional, and global computing career opportunities.

Since its establishment, the CCIT maintains sound relationships with a number of universities inside and outside Egypt for cooperation in both undergraduate studies and supervision of postgraduate studies and research work. Moreover, CCIT has built a number of beneficial relationships with several specialized governmental and private companies in the Egyptian market, to tackle the emerging trends in the Information and Communication Technology (ICT) industry.

CCIT offers opportunities for further career development through a diverse range of postgraduate studies including diploma, Master of Computing, Master of Science, and Ph.D. programs.

The CCIT is located in Abu Qir campus, AASTMT's main campus in Alexandria, Heliopolis campus in Cairo, Smart Village campus, and South Valley campus.

Cybersecurity is one of the programs offered by CCIT. Program aims to develop a generation that could harness innovation with creativity through hands on state of the art Cybersecurity know how and facilities. The program graduates are capable of acquiring numerous outstanding career opportunities and competing in several international competitions to become the next generation of entrepreneurs.

1.1.Degree Offered

The program offers the bachelor degree in Cybersecurity. The candidate for the bachelor degree in cybersecurity is required to pursue scholastic quality and complete a plan of study prepared with his academic advisor and approved by the Computer Science Department Council. The number of credit hours required for graduation is 132 (cr. hr.) spreading over 8 academic semesters. The first 4 semesters are common for all College programs. Then, the student chooses her/his specialization among College Programs. All graduation requirements can be found in section 2.3.

1.2.Program Objectives

Graduates of Cybersecurity program at CCIT are expected, within a few years of graduation, to:

- (PEO1) Have successful careers in a wide range of industries through leveraging their Cybersecurity expertise.
- (PEO2) Advance their Cybersecurity skills through continuous learning, research, and/or graduate studies.
- (PEO3) Further enhance their skills in communication, teamwork, leadership, critical thinking, and time management and commit to ethical, legal, and societal considerations.

The review of the PEOs is launched every year. The primary goal is to periodically ensure that the PEOs are based on the needs of the program's various constituencies and are aligned by the

institution mission. The constituencies of the program are faculty, Industry representatives, alumni, and students.

1.3.Student Outcomes

Student outcomes for the Cybersecurity program were adopted starting Fall 2022/2023 taking into account latest ABET recommendations. The outcomes state that graduates of the program will have an ability to:

- (SO1) Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- (SO2) Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- (SO3) Communicate effectively in a variety of professional contexts
- (SO4) Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles
- (SO5) Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- (SO6) Apply security principles and practices to maintain operations in the presence of risks and threats.

1.4.Mapping Between PEOs and SOs

The following table illustrates the mapping between PEOs and SOs. The table highlights the harmony and relationship between the PEOs and SOs.

	SO1	SO2	SO3	SO4	SO5	SO6
PEO 1	•	•				•
PEO 2	•	•				•
PEO 3			•	•	•	

1.5.Career Opportunities

Cybersecurity prepares graduates to a number of highly required jobs in the market. The following are examples of some of the career opportunities for Cybersecurity graduates:

- Security engineer
- Security Incident responder
- Network Security Administrator
- Cloud Security Administrator
- System Security Administrator
- Digital Forensics Investigator
- Penetration tester
- Cybersecurity managers
- Security consultants
- Chief Security Officer

Upon the completion of the Bachelor of Cybersecurity, graduates have the opportunity to broaden and deepen their academic skills by pursuing post-graduate (masters and doctoral) studies.

Chapter**2****2. PROGRAM PLAN****2.1.General**

The program curriculum provides great flexibility in course selection and offers a broad scientific base by containing a collection of courses in mathematics, physics, humanities, and sciences. These courses are accompanied by Cybersecurity courses covering different areas such as Ethical Hacking and Penetration Testing, Digital Forensics and Incident Response, Software Security, Malware Analysis and Reverse Engineering, Web Security, and others.

2.2.Course Coding**2.2.1.Numbering System**

The course code consists of seven alphanumeric digits, LMN WXYZ

The Letter L : Represents the abbreviation of the college.

The MN : Represent the abbreviations of the specialization.
Letters

The W digit : Represents the course level or the year at which the course is offered in the plan of study.

The X digit : Represents the course group (track).

The YZ digit : Represent the course sequence number within the group.

Course Coding for Professional and Practical Training Courses

The course code consists of CIT-X-Y₁Y₂-W

The Letter X : 1 digit year.

The Letter Y : Y₁Y₂ 2 digits subject divided in ranges.

The W digit : serial 0, 1, 2, or 3 for courses

2.2.2.Abbreviations

The following abbreviations are adopted for the College letter (L)

C - Computing and Information Technology

E - Engineering and Technology

G - Language and Communication

The following abbreviations are adopted for College/Specialization 3 letters (LMN)

College of Computing and Information Technology Courses:

CCS – Computer Science

CCY – Cybersecurity

CGM –Multimedia and Computer Graphics

CIS – Information Systems

CIT – Information Technology (Practical and professional Training)

CNC – Non-Computing

CSE – Software Engineering

CAI – Artificial Intelligence

Other Courses:

UNR – University Requirement

EBA – Basic and Applied Science

GLA – Language

2.2.3. Program Course Group

The Cybersecurity courses are offered in the following 8 different groups:

- CCYX0XX: Data Security
- CCYX1XX: Software Security
- CCYX2XX: Network Security
- CCYX3XX: System and Component Security
- CCYX4XX: Organizational Security
- CCYX5XX: Human and Societal Security
- CCYX9XX: Computing Experience and Societal Aspects¹

2.2.4. University Requirements Course Group

The Humanities subject field offers courses in the following 6 groups:

- UNRX1XX: Personal and Acquired Skills Courses Group.
- UNRX2XX: Ethics and Professional Law Courses Group.
- UNRX3XX: Business Management Courses Group.
- UNRX4XX: Languages and Media Courses Group.
- UNRX5XX: Arts Courses Group.
- UNRX6XX: Environment/Sustainability Courses Group.

¹ CCYX6XX, CCYX7XX and CCYX8XX are for future use.

2.2.5. Professional and Practical Training Course Group

Code	Title
CITx00x	Practical Training (For completion of mandatory summer training)
Range 10-19: Software Engineering	
CITx10x	Software Testing
Range 20 – 29: Programming	
CITx20x	Mobile Applications Programming
CITx21x	Programming
Range 30-39: Networks	
CITx30x	Networking
Range 40-49: Systems	
CITx40x	Operating Systems
CITx41x	Cloud Computing
Range 50-59: Cybersecurity	
CITx50x	Cybersecurity
Range 60-69: Artificial Intelligence	
CITx60x	AI
Range 70-79: Information Systems	
CITx70x	Database
CITx71x	ERP
CITx72x	Geographical Information Systems
Range 80-89: Multimedia	
CITx80x	Multimedia
Range 90-99: Data Science	
CITx90x	Data Science

2.3. Graduation Requirements

To qualify for a bachelor's degree of Cybersecurity, the candidate must:

1. Achieve 132 credit hours with a minimum GPA of 2.0, distributed as follows:

- Humanities, Ethics, and Social Sciences (University Requirements): 10 credit hours (7.5757%).
- Mathematics and Basic Sciences: 18 credit hours (13.63 %)
- Basic Computing Sciences and Character Building (College Requirements): 50 credit hours (37.88%).
- Applied Computing Sciences (Cybersecurity Specialization): 48 credit hours (36.3636%)
 - 36 Compulsory credit hours
 - 12 Major Electives credit hours
- Graduation Project: 6 credit hours (4.54%)

2. Successfully pass 4 professional training courses (zero credit) in trending areas.

3. Successfully conduct practical summer training.

Credit hours Unit:

- 1 contact hour (lecture) = 1 credit hour
- 2 or 3 contact hours (Tutorial & lab) = 1 credit hour

Admission Exam English Proficiency

In semester 1, a preparatory course, Remedial English, is registered in case of students not achieving minimum English proficiency in admission exam.

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Course Group	Semester	Course Code	Course Title	prerequisite	Cr. Hr.	Lectures	Tutorials	Laboratory	Total Contacts
GLA	1	GLA0001	Remedial English	none	0	2	2	-	4
Total Hours					0	2	2	0	4

2.3.1.University Requirements

A total of 10 credit hours are required by the University as per the following two categories: Compulsory and Electives.

2.3.1.1.Compulsory Courses

A total of 6 Cr. Hr. of the following courses are compulsory.

Course Group	Semester	Course Code	Course Title	prerequisite	Cr. Hr.	Lectures	Tutorials	Laboratory	Total Contacts
	1	UNR1403	Academic English	None or Remedial English	2	1	3	-	4
	2	UNR1407	Academic Writing	UNR1403	2	1	3	-	4
	2	UNR2101	Communication and Presentation Skills	UNR1403	2	1	3	-	4
Total Hours					6	3	9	0	12

2.3.1.2. Elective Courses University (College Compulsory)

A total of 2 Cr. Hr. The following course is a compulsory course by College.

Course Group	Semester	Course Code	Course Title	prerequisite	Cr. Hr.	Lectures	Tutorials	Laboratory	Total Contacts
UNR	1	UNR1302	Fundamentals of Business	None	2	2	-	-	2
Total Hours					2	2	-	-	2

2.3.1.3. Elective Courses

A total of 2 Cr. Hr. of the following University requirements elective courses.

Category	Semester	Course Code	Course Title	prerequisite	Cr. Hr.	Lectures	Tutorials	Laboratory	Total Contacts
Category 1	1	UNR1102	Creativity and Innovation	-	2	2	-	-	2
	1	UNR1103	ICT Skills	-	2	2	-	-	2
Category 2	6	UNR4201	Professional Ethics and Practice Law	90 CR. or more	2	2	-	-	2

Category	Semester	Course Code	Course Title	prerequisite	Cr. Hr.	Lectures	Tutorials	Laboratory	Total Contacts
Category 3	1	UNR4301	Introduction to Entrepreneurship	-	2	2	-	-	2
	1	UNR2303	Engineering Economy	-	2	2	-	-	2
	1	UNR2304	Introduction to Leadership	-	2	2	-	-	2
	1	UNR2305	Contemporary issues in Society Business and Economics	-	2	2	-	-	2
	1	UNR1306	Basics of Logistics Management	-	2	2	-	-	2
Category 4	1	UNR1401	Introduction to Mass Communication	-	2	2	-	-	2
	1	UNR1402	Arabic Language	-	2	2	-	-	2
	1	UNR1404	French Language	-	2	2	-	-	2
	1	UNR1405	German Language	-	2	2	-	-	2
	1	UNR1406	Spanish Language	-	2	2	-	-	2
Category 5	1	UNR1501	Art Appreciation	-	2	2	-	-	2
	1	UNR1502	History of Egyptian Art	-	2	2	-	-	2
	1	UNR1503	Music and Civilization	-	2	2	-	-	2
	1	UNR2504	Introduction to Photography	-	2	2	-	-	2
	1	UNR2505	Introduction to Cinematography	-	2	2	-	-	2

Category 6	1	UNR1601	Climate Change and Water Management	-	2	2	-	-	2
	1	UNR1602	Sustainable Development	-	2	2	-	-	2
	1	UNR2603	Environmental Sciences & Technology		2	2	-	-	2
	1	UNR2604	Safety and Risk Assessment	-	2	2	-	-	2
	1	UNR1605	History of Engineering and Technology	-	2	2	-	-	2

2.3.2.College Requirements

A total of 68 Cr. Hr. (23 Courses) are required by the College as per the following table. Students are required to register and pass the following compulsory courses:

Course Group	Semester	Course Code	Course Title	prerequisite	Cr. Hr.	Lectures	Tutorials	Laboratory	Total Contacts
EBA	1	EBA1110	Physics	-	3	2	0	2	4
	Science Elective (Select one course of the following science courses)								
	2	EBA1106	Advanced Physics	EBA1110	3	2	0	2	4
	2	EBA1107	Quantum Physics	EBA1110	3	2	0	2	4
	2	EBA1300	Biochemistry	-	3	2	0	2	4
	Math Courses								
	1	EBA0201	Precalculus (for science students)	None	0	2	2	0	4

Course Group	Semester	Course Code	Course Title	prerequisite	Cr. Hr.	Lectures	Tutorials	Laboratory	Total Contacts
	1	EBA1203	Calculus I	None or (EBA0201 for science students)	3	2	2	0	4
	2	EBA1204	Calculus II	EBA1203	3	2	2	0	4
	3	EBA2203	Probability & Statistics	EBA1204	3	2	2	0	4
	3	EBA2204	Linear Algebra	EBA1204	3	2	2	0	4
	Computing Courses								
CCS	1	CCS1101	Introduction to Computing	-	3	2	2	0	4
	2	CCS1302	Problem Solving and Programming	CCS1101	3	2	2	2	6
	2	CCS1001	Discrete Structures	CCS1101	3	2	2	0	4
	3	CCS2102	Digital Logic Design	CCS1101	3	2	2	2	6
	3	CCS2303	Object-Oriented Programming	CCS1302	3	2	2	2	6
	3	CCS2201	Introduction to Networks	CCS1302	3	2	2	0	4
	4	CCS2103	Introduction to Computer Architecture	CCS2102	3	2	2	0	4
	4	CCS2304	Advanced Programming Applications	CCS2303	3	2	2	0	4
	4	CCS2401	Data Structures and Algorithms	CCS2303	3	2	2	0	4
	4	CCS2305	Web Programming	CIS2101	3	2	2	0	4

Course Group	Semester	Course Code	Course Title	prerequisite	Cr. Hr.	Lectures	Tutorials	Laboratory	Total Contacts
	5	CCS3203	Operating Systems	CCS2103 CCS2401	3	2	2	2	6
CCY	4	CCY2001	Introduction to Cybersecurity	CCS2201	3	2	2	0	4
CAI	5	CAI3101	Introduction to Artificial Intelligence	CCS1001 CCS2401	3	2	2	0	4
CSE	4	CSE2001	Introduction to Software Engineering	CIS1000 CCS2303	3	2	2	0	4
CIS	1	CIS1000	Introduction to Information Systems	-	3	2	2	0	4
	3	CIS2101	Database Systems	CCS1302	3	2	2	0	4
CNC	2	CNC1401	Entrepreneurship Skills	10 Cr. Hrs or more	2	2	-	-	2

2.3.3. Program Requirements

A total of 54 credit hours (42 credit hours of compulsory courses and 12 credit hours of electives) are required by specific specialization, which are distributed as follows:

2.3.3.1 Compulsory Courses

A total of 42 credit hours of compulsory courses as per the following table.

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Course Group	Semester	Course Code	Course Title	prerequisite	Cr. Hr.	Lectures	tutorials	Laboratory	Total Contacts
CCY	5	CCY3002	Introduction to Cryptography	CCY2001 EBA2204	3	2	2	-	4
	5	CCY3101	Software Security	CCY2001 CSE2001	3	2	-	2	4
	6	CCY3201	Networks Security	CCY3002	3	2	-	2	4
	5	CCY3501	Cybersecurity Law and Ethics	CCY2001	3	2	2	-	4
	6	CCY3302	Distributed Systems Security	CCS3203 CCY2001	3	2	2	-	4
	6	CCY3003	Digital Forensics and Incident Response	CCY2001	3	2	-	2	4
	6	CCY3102	Malware Analysis and Reverse Engineering	CCY2001 CCS2103	3	2	-	2	4
	7	CCY4202	Ethical Hacking and Penetration Testing	CCY3201	3	2	-	2	4
	7	CCY4301	Cyber Physical Systems Security	CCY3201	3	2	-	2	4
	7	CCY4901	Project I	GPA >= 2.0 & 90 CR or more	3	2	2	-	4
	8	CCY4303	AI in Cybersecurity	CCY2001 CAI3101	3	2	2	-	4
	8	CCY4401	Cybersecurity Risk Management	CCY2001	3	2	2	-	4
	8	CCY4902	Project II	CCY4901	3	2	2	-	4
CCS	6	CCS3403	Computing Algorithms	CCS2401	3	2	2	-	4
Total Hours					42	28	16	12	56

2.3.3.2 Program Major Electives

The student chooses 4 elective courses of the following list (12 Cr. Hr.).

Course Group	Semester	Course Code	Course Title	prerequisite	Cr. Hr.	Lectures	tutorials	Laboratory	Total Contacts
CCY	7/8	CCY4004	Advanced Digital Forensics	CCY3003	3	2	-	2	4
		CCY4005	Advanced Cryptography	CCY3002	3	2	2	-	4
		CCY4006	Multimedia Security	CCY3002	3	2		2	4
		CCY4103	Blockchain and Applications	CCY3002	3	2	-	2	4
		CCY4104	Web Security	CCS2305 CCY2001	3	2	-	2	4
		CCY4105	E-business Security	CIS1000 CCY2001	3	2	2	-	4
		CCY4203	Internet of Things Security	CCY3201	3	2	-	2	4
		CCY4204	Advanced Penetration Testing	CCY4202	3	2	-	2	4
		CCY4205	Wireless Networks Security	CCY3201	3	2	-	2	4
		CCY4304	Operating Systems Security	CCS3203 CCY2001	3	2	-	2	4
		CCY4305	Advanced Malware Analysis and Reverse Engineering	CCY3102	3	2	-	2	4
		CCY4307	Cloud Computing Security	CCS3203 CCY2001	3	2	-	2	4
		CCY4402	Cybersecurity Policy and Governance	CCY2001	3	2	2	-	4
		CCY4403	Cyber Threat Intelligence	CCY3002	3	2	2	-	4
		CCY4502	Usable Security	CCY2001	3	2	2	-	4

2.3.3.3 Professional and Practical Training Courses

Practical Training

All students must complete practical summer training.

Course Code	Course Title
CIT4000	Practical Training

Professional Training Tracks and Courses

CCIT curriculum is designed in such a manner as to inject professional training courses within the curriculum to better aid in preparation of the student for the computing job market heavily relying on certifications offered by major IT companies. Such courses are zero credit courses but are mandatory for graduation requirements. Furthermore, such courses prepare the students to possibly sit for international certification exams.

Professional Training starts in term 5 by the core course professional training in Mobile Applications Programming. Starting semester 6, the student chooses a professional training track, where she/he has to cover 3 Professional Training courses in the chosen track in terms 6, 7, and 8 respectively. The following table shows Professional Training courses in each track. More professional training specializations could be added in the future where the main criteria are the market need, the availability of an international certification, and the availability of qualified instructors. Currently, not all professional training tracks are offered.

Subject	Track title	Courses
Range 10-19: Software Engineering		
10	Software Testing	CIT3101 CIT4102 CIT4103 Professional Training in Software Testing I, II, and III
Range 20 – 29: Programming		
20	Mobile Applications Programming	CIT3200 Professional Training in Mobile Apps Programming <i>Compulsory for all students</i>
21	Programming	CIT3211 CIT4212 CIT4213 Professional Training in Programming I, II, and III
Range 30-39: Networks		
30	Networking	CIT3301 CIT4302 CIT4303 Professional Training in Networking I, II, and III
Range 40-49: Systems		
40	Operating Systems	CIT3401 CIT4402 CIT4403 Professional Training in Operating Systems I, II, and III
41	Cloud Computing	CIT3411 CIT4412 CIT4413 Professional Training in Cloud Computing I, II, and III
Range 50-59: Cybersecurity		
50	Cybersecurity	CIT3501 CIT4502 CIT4503 Professional Training in Cybersecurity I, II, and III
Range 60-69: Artificial Intelligence		
60	AI	CIT3601 CIT4602 CIT4603 Professional Training in AI I, II, and III
Range 70-79: Information Systems		

Subject	Track title	Courses
70	Database	CIT3701 CIT4702 CIT4703 Professional Training in Database I, II, and III
71	ERP	CIT3711 CIT4712 CIT4713 Professional Training in ERP I, II, and III
72	Geographical Information Systems	CIT3721 CIT4722 CIT4723 Professional Training in GIS I, II, and III
Range 80-89: Multimedia		
80	Multimedia	CIT3801 CIT4802 CIT4803 Professional Training in Multimedia I, II, and III
Range 90-99: Data Science		
90	Data Science	CIT3901 CIT4902 CIT4903 Professional Training in Data Science I, II, and III

2.4.Study Plan

Course Code	Course Title	Prerequisites	Cr. Hr.	Contact Hrs.				Course Code	Course Title	Prerequisites	Cr. Hr.	Contact Hrs.			
				Lectures	Tutorial	Laboratory	Total Contact					Lectures	Tutorial	Laboratory	Total Contact
Semester 1								Semester 2							
UNR1403	Academic English	-	2	1	3	0	4	UNR2101	Communication and Presentation Skills	UNR1403	2	1	3	0	4
UNR1302	Fundamentals of Business	-	2	2	0	0	2	UNR1407	Academic Writing	UNR1403	2	1	3	0	4
UNRxxxx	University Req. Elective	-	2	2	0	0	2	EBAxxxx	Science Elective		3	2	0	2	4
EBA1203	Calculus I	None or (EBA0201 for science students)	3	2	2	0	4	EBA1204	Calculus II	EBA1203	3	2	2	0	4
EBA1110	Physics	-	3	2	0	2	4	CCS1302	Problem Solving and Programming	CCS1101	3	2	2	2	6
CCS1101	Introduction to Computing	-	3	2	2	0	4	CCS1001	Discrete Structures	CCS1101	3	2	2	0	4
CIS1000	Introduction to Information Systems	-	3	2	2	0	4	CNC1401	Entrepreneurship Skills	10 CR. or more	2	2	0	0	2
¹ EBA0201	Precalculus	-	0	2	2	0	4								
² GLA0001	Remedial English	-	0	2	2	0	4								
Total Hrs			18	13	9	2	24	Total Hrs			18	12	12	4	28
Semester 3								Semester 4							
CCS2102	Digital Logic Design	CCS1101	3	2	2	2	6	CCS2401	Data Structures and Algorithms	CCS2303	3	2	2	0	4
CCS2303	Object-Oriented Programming	CCS1302	3	2	2	2	6	CSE2001	Introduction to Software Engineering	CCS2303 CIS1000	3	2	2	0	4
EBA 2204	Linear algebra	EBA 1204	3	2	2	0	4	CCS2304	Advanced Programming Applications	CCS2303	3	2	2	0	4
CCS2201	Introduction to Networks	CCS1302	3	2	2	0	4	CCS2305	Web Programming	CIS2101	3	2	2	0	4
CIS2101	Database Systems	CCS1302	3	2	2	0	4	CCS2103	Introduction to Computer Architecture	CCS2102	3	2	2	0	4
EBA2203	Probability & Statistics	EBA 1204	3	2	2	0	4	CCY2001	Introduction to Cybersecurity	CCS2201	3	2	2	0	4
Total Hrs			18	12	12	4	28	Total Hrs			18	12	12	0	24
Semester 5								Semester 6							
CCY3002	Introduction to Cryptography	CCY2001 EBA2204	3	2	2	-	4	CCY3201	Networks Security	CCY3002	3	2	-	2	4
CCY3501	Cybersecurity Law and Ethics	CCY2001	3	2	2		4	CCY3102	Malware Analysis and Reverse Engineering	CCY2001 CCS2103	3	2	-	2	4
CAI3101	Introduction to Artificial Intelligence	CCS1001 CCS2401	3	2	2	-	4	CCY3302	Distributed Systems Security	CCS3203 CCY2001	3	2	2	-	4
CCY3101	Software Security	CCY2001 CSE2001	3	2	-	2	4	CCS3403	Computing Algorithms	CCS2401	3	2	2	-	4
CCS3203	Operating Systems	CCS2103 CCS2401	3	2	2	2	6	CCY3003	Digital Forensics and Incident Response	CCY2001	3	2	-	2	4
CIT3200	Professional Training in Mobile Apps Prog.	-	0	-	2	-	2	CITxxxx	Professional Training	-	0	-	2	-	2
Total Hrs			15	10	10	4	24				15	10	6	6	22

Bachelor of Cybersecurity

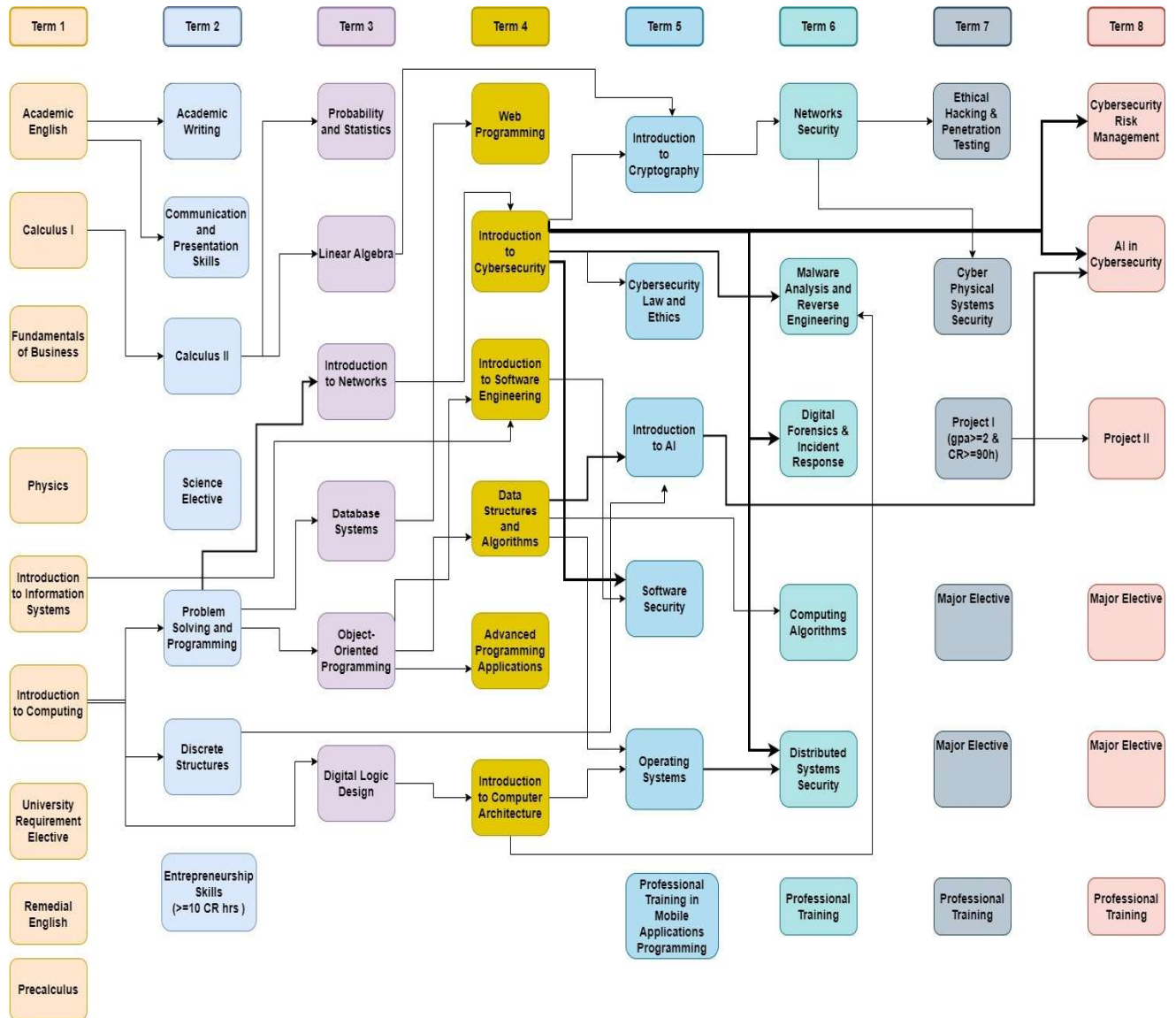
Semester 7								Semester 8							
CCY4301	Cyber Physical Systems Security	CCY3201	3	2	-	2	4	CCY4303	AI in Cybersecurity	CCY2001 CAI3101	3	2	2	-	4
CCY4202	Ethical Hacking and Penetration Testing	CCY3201	3	2	-	2	4	CCY4401	Cybersecurity Risk Management	CCY2001	3	2	2	-	4
CCY4901	Project I	GPA>=2.0 & 90 CR or more	3	2	2	-	4	CCY4902	Project II	CCY4901	3	2	2	-	4
CCYxxx	Major elective		3	2	-	2	4	CCYxxx	Major elective		3	2	2	-	4
CCYxxx	Major elective		3	2	-	2	4	CCYxxx	Major elective		3	2	2	-	4
CITxxx	Professional Training	-	0	-	2	-	2	CITxxx	Professional Training	-	-	-	2	-	2
Total Hrs			15	10	4	8	22	Total Hrs			15	10	12	0	22

Total Numbers	
University Requirements Cr. Hrs.	10
College Requirements Cr. Hrs.	68
Specialization Cr. Hrs. (Compulsory)	42
Specialization Cr. Hrs. (Major Electives)	12
Program total Cr. Hrs.	132
Program total Contact Hrs. (186+8 Zero Credit)	194

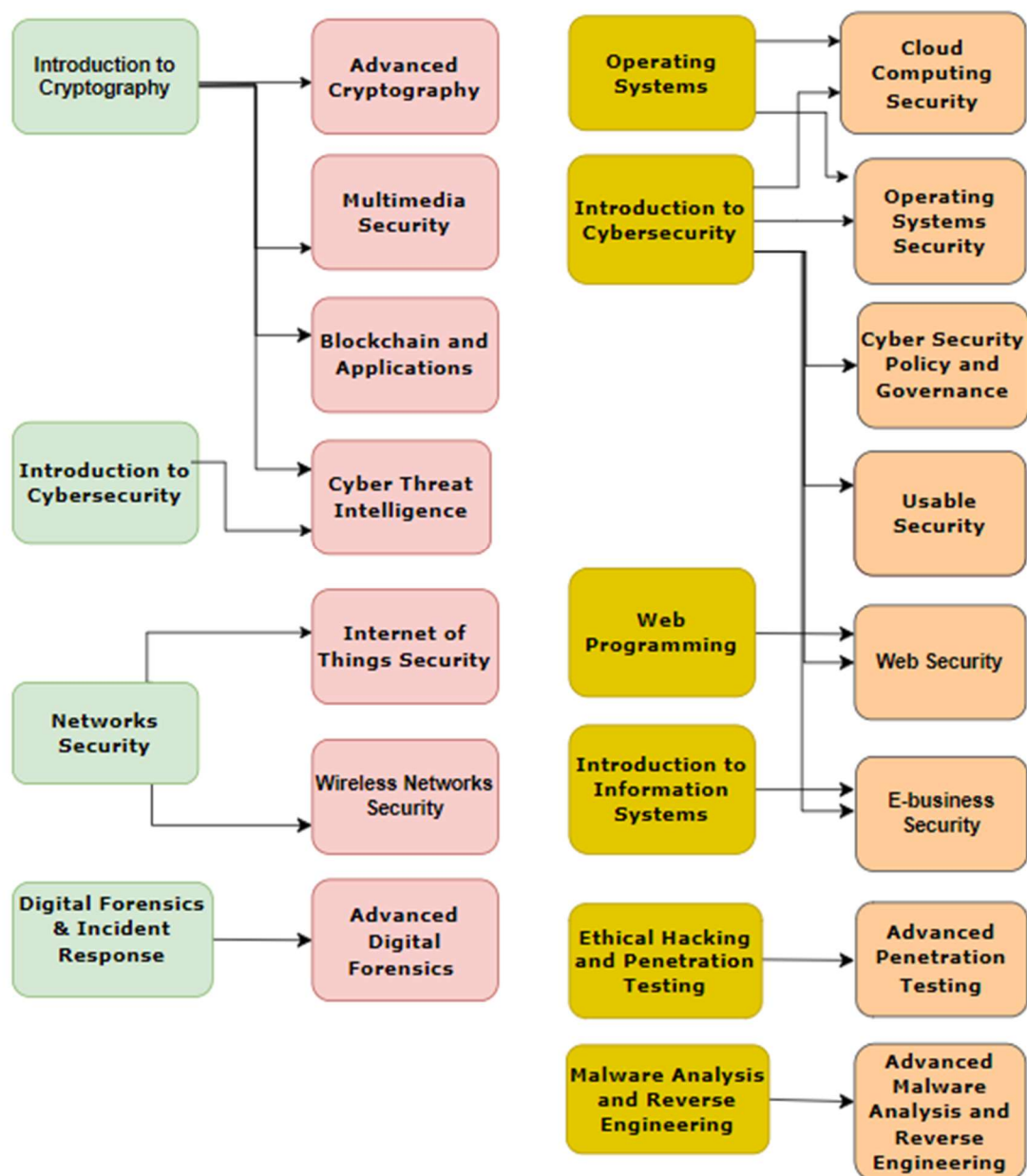
Notes:

1. In semester 1, Science section students register course Precalculus instead of Calculus I. The student has to successfully pass this course before moving to 2nd level courses (semesters 3 and 4).
2. In semester 1, a preparatory course, Remedial English, is registered in case of students not achieving minimum English proficiency in admission exam.

2.5.Prerequisites Map



Major Electives



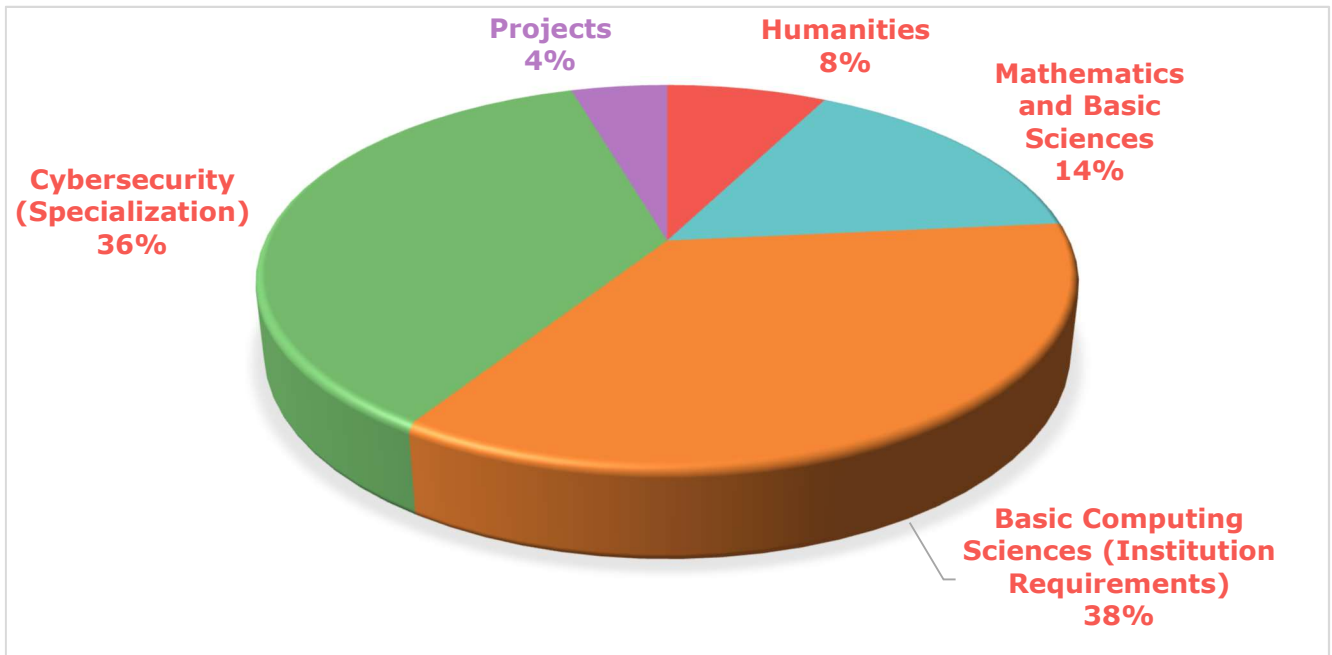
2.6.Course Outcomes Mapping

Competencies Course Group		Program Learning Outcomes (PLOs)					
		PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6
Basic and Applied Science	EBA	■		■			■
Information Systems	CIS	■	■	■	■		■
Software Engineering	CSE	■	■	■	■	■	
Cybersecurity	CCY	■	■				■
University Requirements	UNR			■	■	■	
Non-Computing	CNC	■		■	■	■	
Data Security	CCYX0XX	■	■			■	■
Software Security	CCYX1XX	■	■			■	■
Network Security	CCYX2XX	■	■			■	■
System and Component Security	CCYX3XX	■	■			■	■
Organizational Security	CCYX4XX				■	■	■
Human and Societal Security	CCYX5XX				■	■	■
Computing Experience and Societal Aspects	CCYX9XX	■	■	■	■	■	■
Professional and Practical Training	CITXXXX		■	■	■	■	■

2.7.Academic Program Analysis

Categories	Min% According to ref. Std.	Max% According to ref. Std.	Course Code	Course Title	Credit hours	Percentage (%)
Humanities, Ethical and Social Sciences (Uni. Requirements)	8	10	UNR1403 UNR1407 UNR2101 UNR1302 UNRXXXX	Academic English Academic Writing Communication and Presentation Skills Fundamentals of Business University Requirements Elective Total	2 2 2 2 2 10	7.5757
Mathematics and Basic Sciences	16	18	EBA1203 EBA1204 EBA2203 EBA2204 EBA1110 EBAxxxx	Calculus I Calculus II Probability and Statistics Linear Algebra Physics Science Elective Total	3 3 3 3 3 3 18	13.6363
Basic Computing Sciences and Character Identifying	Min. 26 + 16 (Character) = 42	Max. 28 + 4 (Character) = 32	CCS1101 CIS1000 CCS1302 CCS1001 CCS2102 CCS2303 CSE2001 CCS2103 CIS2101 CCS2201 CCS2401 CCS2304 CCY2001 CCS2305 CCS3203 CAI3101 CNC1401	Introduction to Computing Introduction to Information Systems Problem Solving and Programming Discrete Structures Digital Logic Design Object Oriented Programming Introduction to Software Engineering Introduction to Computer Architecture Database Systems Introduction to Networks Data Structures and Algorithms Advanced Programming Applications Introduction to Cybersecurity Web Programming Operating Systems Introduction to AI Entrepreneurship Skills Total	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 2 50	37.88
Cybersecurity (Specialization)	28	30	CCS3403 CCY3002 CCY4301 CCY3201 CCY3501 CCY3302 CCY3101 CCY4401 CCY3003 CCY4202 CCY4303 CCY3102 CCYxxxx	Computing Algorithms Introduction to Cryptography Cyber Physical Systems Security Networks Security Cybersecurity Law and Ethics Distributed Systems Security Software Security Cybersecurity Risk Management Digital Forensics and Incident Response Ethical Hacking and Penetration Testing AI in Cybersecurity Malware Analysis and Reverse Engineering 4 Major Electives Total	3 3 3 3 3 3 3 3 3 3 3 3 12 48	36.3636
Projects	3	5	CCY4901 CCY4902	Project I Project II Total	3 3 6	4.5455
Total Percentage	97	95			132	100
Training	3	5	CIT4000 CITxxxx	Practical Training Professional Training Courses Total	Eq. to 1 Eq. to 4 Eq. to 5	Equivalent to 3.8

Bachelor of Cybersecurity



Chapter

3

3. PROGRAM COURSE SUMMARY

This chapter provides brief description of the courses of the program. The course sections are organized as follows:

- University Requirements
- College Requirements
- Program Requirements

Admission Exam English Proficiency

GLA 0001- Remedial English

(In semester 1, a preparatory course, Remedial English, is registered in case of students not achieving minimum English proficiency in admission exam)

Prerequisites: None – Cr. Hrs. 0

The course aims at enhancing learners' four language skills, improving their general lexical repertoire and preparing them to communicate their ideas effectively. The course is also designed to train learners to identify the various types and functions of a sentence and follow the principles and stages of the writing process of a coherent paragraph.

3.1.University Requirements

3.1.1 Compulsory Courses BY UNIVERSITY

UNR2101 –Communication and and Presentation Skills

Prerequisites: UNR1403 – Cr. Hrs. 2

This course aims at enhancing students' technical communication skills, especially writing and oral skills. The course provides both theoretical and practical bases for the students to master different types of skills needed for communicating effectively in the workplace. The course also helps students to build on their communication strengths and learn how to remedy their weaknesses through constructive feedback. Topics include communicating effectively in the workplace, conducting formal meetings, conducting interviews and delivering persuasive presentations.

UNR1403 – Academic English

Prerequisites: None – Cr. Hrs. 2

The course aims at developing and enhancing the learners' listening, reading, speaking and writing skills, improving their lexical repertoire and building grammatical structures efficiently. This is intended to help them communicate their ideas appropriately and effectively in real life situations, verbally as well as in writing.

UNR1407 – Academic Writing

Prerequisites: UNR1403 – Cr. Hrs. 2

This course aims at enhancing students' academic writing skills. The course provides both theoretical and practical bases for the students to master different types of skills needed for effective writing in an academic context. The course helps students to build on their writing strengths and learn how to remedy their weaknesses through constructive feedback.

3.1.2 ELECTIVE COURSES BY UNIVERSITY (COLLEGE COMPULSORY)

UNR1302 - Fundamentals of Business

Prerequisites: None – Cr. Hrs. 2

Introduction to the course – overview of business environment, The contemporary business environment – Entrepreneurship, Business

Management – the management process, types of managers, contingency planning and crisis management., Organizing the Business – types of organizational structures, Operations Management – services and goods, Quality and productivity, quality improvement, Leadership and Decision Making, Human Resource Management – staffing and developing workforce, Principles of Marketing: marketing plan, marketing strategy, product life cycle., Principles of Marketing: Developing and Pricing Products– pricing strategies, Financial Systems: Understanding Money , Financial Systems: Managing Business Finances, Accounting and Financial Reporting

3.1.3 Elective Courses

UNR1102 - Creativity and Innovation

Prerequisites: None – Cr. Hrs. 2

Theoretical elements, Different aspects of creativity, Development of cognitive abilities, Influential factors (environmental, social, personal, organizational), Creativity approaches (methods, techniques, activities), Metacognitive processes, Mind-mapping, six hats, SCAMPER, bionics, examples and projects, Marketing, improvisation and invention, Encoding information, concept map, Vee diagram.

UNR1103 - ICT Skills

Prerequisites: None – Cr. Hrs. 2

Introducing students with Computer Applications, ICT Skills and impact of ICT on various sectors. Digital Transformation and Information Technology at the edge of 4th Industrial Revolution and Ethics of Technology. Data presentation, processing, Big Data Volumes, new technology for data storage handling and principles of Artificial intelligence in various Engineering Sectors. Learn Web-Development, websites building tools and Web-Search Skills. Creating generative forms, GUIs Graphical user interfaces. Creating Database Files and GUIs links with Database handling Tools and application case studies in various Engineering problems. Fundamentals of Mobile Applications, needs, development tools and application case-studies.

UNR4201 - Professional Ethics and Practice Law

Prerequisites: 90 Cr. Hrs. – Cr. Hrs. 2

Introduction to the course Ethics and Professionalism - Moral Reasoning and Codes of Ethics - Moral Frameworks - Engineering as Social Experimentation - Commitment to Safety - Workplace Responsibilities and Rights - Honesty - Environmental Ethics - Global Issues - Engineers and Technological Progress - General Resources on Engineering Ethics - Examples of Codes of Ethics (ABET, IEEE) - Preparation for the Professional Practice Exam (PPE), a requirement for students who want to become professional engineers - Case Studies

UNR4301 - Introduction to Entrepreneurship

Prerequisites: 112 Cr. Hrs. – Cr. Hrs. 2

Introduction to Entrepreneurship, Feasibility Analysis, Developing an Effective Business Model, writing a Business Plan, writing a Business Plan, Preparing the Proper Ethical and Legal Foundation, Financial Planning: Getting Financing or Funding, Managing the cash flow, Unique Marketing Issues., Ecommerce and Pricing, Franchising. Building a New-Venture Team.

UNR2303 - Engineering Economy

Prerequisites: 33 Cr. Hrs. – Cr. Hrs. 2

Cost Analysis., Principles of money – time relations, the concept of economic equivalence, Cash flow diagrams: Interest formulas and uniform series, Cash flow diagrams: Uniform gradient series, Nominal and effective interest rates, continuous compounding, and continuous cash flows., Applications of engineering economy, Depreciation., Evaluating Projects with Benefit-to Cost ratio Method.

UNR2304 – Introduction to Leadership

Prerequisites: None – Cr. Hrs. 2

The course is designed to help students understand leadership principles and practice leadership skills through a thoughtful balance of essential theory and real-world applications. The course provides a strong practical foundation by introducing leaders you can relate to and reinforcing your knowledge with frequent skill-building activities.

UNR2305 – Contemporary Issues in Society Business and Economics

Prerequisites: None – Cr. Hrs. 2

This course exposes students to in-depth knowledge of current global issues in Business and Economics, under the current situation of globalization.

UNR1306 – Basics of Logistics Management

Prerequisites: None – Cr. Hrs. 2

Principles of Logistics, Logistics Activities, Main Activities and Utility Activities, Logistics Organization and Control, Logistics System and Infrastructure, Strategic Logistics, International Logistics, IT in Logistics, Logistics Network Planning and Business Models.

UNR1401 - Introduction to Mass Communication

Prerequisites: None – Cr. Hrs. 2

Introduction to the course – Introduction to media (Understanding the media)., Communication Process, types & barriers of communication, Public Speaking Art (skills of writing public speech and skills of performing), Printed Newspapers(history, organizational system, types, and writing characteristics) Magazines (content types & designs) , Online journalism (advantages & disadvantages, effects on traditional journalism), Radio (history, development, types of content, online radio), Television, Introduction to Public relations, Advertising , Advertising appeals, Social marketing (definitions, techniques, case studies.

UNR1402 - Arabic Language

Prerequisites: None – Cr. Hrs. 2

An overview of the course content and the importance of Arabic in various fields of specialization - Arabic structures - The uses of simple and compound Arabic sentences - Rules for writing a paragraph in Arabic - Rules for report preparation and writing - Rules for writing applications, resumes and the techniques used for each of them - Principles of summarizing to ensure its correctness and validity - Using Arabic for quick and brief presentations - Rules for writing official correspondences. Training on managing dialogues and discussions in Modern Standard Arabic (MSA) and promoting colloquial Arabic -Correcting spelling mistakes that can lead to misunderstanding/ misconception -

Studying errors resulting from rendering foreign books without taking into account the Arabic structures.

UNR1404 - French Language

Prerequisites: None – Cr. Hrs. 2

Introduction to the course - Initial contact - Introduce yourself - making contact - start a conversation, (telephone) facing complications - Greet someone - write an e-mail - Agenda - Suggest - take - note - postpone - cancel an appointment. Organize your working time - Check information. Travel - Find out about the place of destination - get around - go sightseeing - ask - understand - explain an itinerary. Expression of place - Imperfect - Imperative - Indirect speech. Hotel - find out about a hotel - take - modify - report a reservation - Check a note - write a complaint. Company - identify the company - explain, draw a graph - analyze compare results. Interaction - Application - Adverbs - numbers - expressions of comparison. Find a job: Consult, analyze a job offer, write an ad. Write a motivation letter, a C.V. Interaction - Job interview: Prepare, analyze, a job interview. Talk about yourself, your motivations. Interaction- Application. Expression of the goal - Taking the floor. Practice active listening. Knowing how to compare, reformulate. Make a presentation.

UNR1405 - German Language

Prerequisites: None – Cr. Hrs. 2

This course aims at enhancing learners' four language skills: listening, speaking, reading, and writing. In addition, it supports each skills-based lesson with speaking real-life activities designed to give students the opportunity to acquire and practice vocabulary and grammar.

UNR1406 - Spanish language

Prerequisites: None – Cr. Hrs. 2

Introduction to the course, overview of Spanish language and culture, Alphabets, introduction to pronunciation and multiple activities on pronouncing words. Application using mini conversations. Describing people, introducing adjectives of description and new vocabulary about body parts. Speaking about places, Introducing vocabulary about the house and the class. Describing places (house, class) and describing objects. Introducing definite and indefinite articles, interrogatives, demonstrative adjectives and possessive adjectives, Introduction to Comparison. Talking about famous feasts and parties in Spain. Introducing adverbs of frequency. Do's and don'ts comparing

between Egypt and Spain. Application doing debates. Introduction to the imperative, The difference between orders and favors. How to express preferences (like and dislike). Introducing direct and indirect objects. How to express pain. How to express exclamation, obligation and condition. Introducing simple future. Introducing real situations in a restaurant. Description of countries, cities and villages. Speaking about weather conditions.

UNR1501 - Art Appreciation

Prerequisites: None – Cr. Hrs. 2

Introduction to fine Arts, Art in our lives, The Basic Meaning of Art Explained- Line, Design elements: Shape and Form Design elements: Space, Design elements: Texture and pattern – Value, Design elements: Color psychology, Color theory, The Principles of Design: Balance- Emphasis- Contrast- Repetition, The Principles of Design: Proximity- Proportion - Harmony- Unity & Variety

UNR1502 - History of Egyptian Art

Prerequisites: None – Cr. Hrs. 2

This course introduces students to a survey of Egyptian art from the predynastic period to the contemporary period, highlighting various topics including Natural and social contexts. Composition, conventions, materials, patterns, colours, influences. Art in the Amarna Period - Graeco-Roman Egypt: Art in the Ptolemaic period - Ancient Egyptian Art: The rediscovery of Egyptian art in the 19th century. Reception of ancient Egyptian art in the modern world. Egyptomania. Egyptian Revival styles - Coptic (Late Antique) Egypt: The rise of Christianity. Coptic art: conventions, details, and patterns - Islamic Egypt: Principles and meanings of Islamic geometric design. Exercise with patterns - Islamic Egypt: Art in Mamluk Egypt and Ottoman Egypt - Modern Egyptian Art: 19th and 20th century art: Socio-political context - Modern Egyptian Art: Pioneer artists - Trends in Egyptian Contemporary Art (1945-2000).

UNR1503 - Music and Civilization

Prerequisites: None – Cr. Hrs. 2

This course provides a tour through the world of music. Music & Civilization Definitions: Music, Sound, Pitch, Dynamics, Timbre (Voices and Instruments). Basic Elements of Music: Melody, Harmony, Rhythm, Texture and Form. Musical Styles: Ancient Music: Egyptian, Mesopotamian Greek and Roman Music., Western Classical Music: Medieval, Renaissance, Baroque, Classical, Romantic, Medieval Period (450-1450), the Renaissance

Period (1450-1600), Baroque Period (1600-1750), Classical Period, Romantic Period (1820-1900), Modern Music (20th Century To World War II).

UNR2504 - Introduction to Photography

Prerequisites: None – Cr. Hrs. 2

This course explores the practical and creative interplay between photographic practice and theory in the field of visual representations of urban space. Technical aspects: camera types - camera parts, Technical aspects: lenses and accessories, Focal lengths, vision angles - aperture – shutter speed and iso, Photographic composition: introduction, Photographic composition: emphasis, Dealing with light: natural and artificial, shades and shadows , Dealing with light: flash, Balance – Contrast: colors, Contrast: texture, Dealing with movable objects, Special photographic effects, Photographic project.

UNR2505 - Introduction to Cinematography

Prerequisites: None – Cr. Hrs. 2

This course introduces students to the basic skills and techniques of filmmaking with special focus on cinematography. Basic camera operation, lenses, composition, camera angles, types of shots, and photo sequence are covered. The course also tackles visual storytelling, mise en scène, camera movement, storyboarding, script writing, and video editing. Students practice applying the different types of cuts and the basics of video editing software using Adobe Premiere Pro, color correction and color grading, in addition to text and animation.

UNR1601 - Climate Change and Water Management

Prerequisites: None – Cr. Hrs. 2

Importance of Water for Economic Development, Climate Change, Its Drivers and impacts, Climate Change Mitigation and Adaptation, Climate Change Vulnerabilities and Risk Assessment, Water and Climate Change - Current Challenges, Introduction to Water resource Management and International Frameworks for IWRM, Water Supply and Distribution, Sources of Water and Minimizing Water Loss, Water Scarcity - Predictions and Preparedness, Safe Wastewater Reuse, Treatment and Recycling, Projections of future climate change impacts on the water cycle, Strategy Development and Planning for Adaptation, Technologies

for addressing adaptation challenges, Climate Change Impacts on Agriculture and Drought Risk Management, Conflict issues in water resources management and water rights

UNR1602 - Sustainable Development

Prerequisites: None – Cr. Hrs. 2

Fundamental concepts of sustainability and sustainable development. Computing and sustainability and sustainable development. Green ICT. Resource conservation. Renewable resources. Design for extreme affordability. Problem solving methods. Methods to identify and select sustainable solutions to design problems. Methods of improving existing ICT solutions. Methods of systems thinking. Technical, economic, and social consequences of ICT practices and processes. Complex decisions related to social and environmental issues. Application of science and innovation to meet human needs while indefinitely preserving the life support systems of the planet.

UNR2603 - Environmental Sciences and Technology

Prerequisites: None – Cr. Hrs. 2

Environmental sciences and definitions of physical, chemical, biological, and social environments and environmental studies.

- Ecology and ecological systems, formations, functions and limiting factors, energy transfer and materials cycling in ecosystem.
- Terrestrial and marine environments, food chains and food webs.
- Main environmental problems extinction and biodiversity of organisms, resources depletion and environmental pollutions.
- Environmental ethics principals of eco-centrism and anthropocentrism.
- Sustainability of natural system and sustainable development in energy and water utilizations.
- Changing the role of technology, preventive technology, waste treatment, pollution control, recycling of wastes, green technology, cleaner production, life cycle assessment.
- Population growth, environmental problems, environmental modelling and applications.
- Air pollution sources, types and control, smoke, fogs and smog phenomena.
- Greenhouse gases and impacts on the environment.
- Climate change and sea level rise and its management.
- Acid rains and its effects on soil, water and biological systems.
- Tropospheric and stratospheric ozone sources, roles and effects.
- Water pollution types, sources and treatments.

UNR2604 - Safety and Risk Assessment

Prerequisites: None – Cr. Hrs. 2

Introduction to Safety Risk Assessment - The type of risk assessment in workplace - Identifying and Defining Varying Levels and Types of Risk - Hazardous Activities Can Include Issues (Specific Hazards) - Complexity of Work - Age of Equipment and Preventative Maintenance Programs - Specific Federal, State, and Local Regulations for Business Activities - Determine Potential Risk in a Work Environment - Risk Analysis - Risk Matrix Template - Risk Evaluation - Risk Communication - Risk Plan off The Ground - Risk Management - Documentation for Risk Assessment and Management.

UNR1605 - History of Engineering and Technology

Prerequisites: None – Cr. Hrs. 2

Definitions of art, science, technology and engineering, The Relation of Art, Science and engineering , History of industrial revolution, History of second industrial revolution, History of information Revolution, Environmental engineering history and advances, Social involvement in technological advances, Branches of engineering Overview, Contrast of the different branches of Engineering , Career opportunities in Engineering branches, Environmental engineering history and advances, Energy situation in Egypt – Energy balance., Energy alternatives in Egypt.

3.2.College Requirements

3.2.1 Basic and Applied Science Courses (EBA)

3.2.1.2 Compulsory Courses

EBA 0201 – Precalculus (for science section students)

Prerequisites: None – Cr. Hrs. 0

This course provides knowledge about algebra concepts, solid geometry, calculus, statistics, and dynamics. Algebra concepts include permutations complex numbers, and determinants. Solid geometry includes lines and planes, and orthogonal projections. Calculus concepts are limits and continuity, differentiation, behavior, of functions and sketching its graphs, and integration. Statistics concepts include scalar and vector product, the force, equilibrium of a system of coplanar forces. Dynamics include the velocity, the straight motion with uniform acceleration, vertical motion under gravity, differentiation of vector functions, Newton's law of motion, impulse and collision, and work- power-energy.

EBA 1110– Physics

Prerequisites: None – Cr. Hrs. 3

Electrostatics + Coulomb's law - Electric field – Motion of charged particles in a uniform electric field- Electric flux and Gauss law – Electric Potential energy and electric potential – Capacitors(parallel plate capacitors, energy stored) – Capacitors in series and parallel – Electric current- Ohm's law- resistivity- Power in the circuits – Resistors in series and parallel – Kirchhoff's rules-R.C circuit – Magnetism (Force on a charge in magnetic field) Force on a current-carrying conductor in magnetic field. Biotsavart law and its application – Amper's law and its applications – Electromagnetic Induction- Magnetic flux- Faraday's law - Mutual Induction- Self Induction–Introduction to electromagnetic waves- electromagnetic spectrum – Interference-Young's double slit experiment.

EBA1203 -Calculus I

Prerequisites: None or EBA0201 for Science students – Cr. Hrs. 3

Functions (New Functions from Old – Composition of Functions – Families of Functions) –Trigonometric Functions - Inverse Functions – Inverse Trigonometric Functions–Exponential and Logarithmic Functions - Limits at Infinity; End Behavior of a Function–Tangent Lines and rate of change, The Derivative Function, Techniques of Differentiation, The product and quotient rules Derivatives of Trigonometric Functions, The Chain Rule, Implicit Differentiation– Derivatives of Logarithmic, Exponential and Inverse trigonometric Functions–Hyperbolic / Inverse Hyperbolic Functions and their Derivatives–Indeterminate Forms and L'Hopital's Rule: Partial Differentiation–Taylor's and Maclaurin's expansions–Curve sketching: Critical, maximum, minimum and inflection points–Conic sections: Parabola.

EBA 1204 - Calculus II

Prerequisites: EBA 1203 – Cr. Hrs. 3

This course provides the differentiation of indefinite integrals and table of famous integrals. The topics of interest include simple rules of integration & the fundamental theorem of calculus, fundamental theorem of calculus and integration by parts, integration of rational function, integration of trigonometric powers, trigonometric substitution, and integration of quad forms, the reduction formulas and definite integration. Application of integration: Area and volume, length of curve, average of function, numerical integration, matrix Algebra. And solution of systems of linear equations. It also illustrates solving

systems of linear equations which leads to the algebra of matrices, determinants, vector spaces, bases and dimensions.

EBA 2203 - Probability & Statistics

Prerequisites: EBA 1204 – Cr. Hrs. 3

This course aims to provide an understanding of the basic concepts in probability theory and Statistical analysis and its applications for decision-making in economics, business, and other fields of social sciences. The course is heavily oriented towards the formulation of mathematical concepts on probability and probability distributions and densities with practical applications.

EBA 2204 - Linear algebra

Prerequisites: EBA 1204 – Cr. Hrs. 3

This course illustrates the nature of mathematics as a blend of technique, theory, and applications. The important problem of solving systems of linear equations leads to the algebra of matrices, determinants, vector spaces, bases and dimension, linear transformations, and Eigen values. Vector spaces are studied in an abstract setting, examining the concepts of linear independence, span, bases, subspaces, and dimension. There follows a discussion of the association between linear transformations and matrices.

3.2.1.1 Science Elective Courses

EBA 1106 – Advanced Physics

Prerequisites: EBA 1110 – Cr. Hrs. 3

The course is an advanced level physics course that gives the student the chance to absorb waves with its various properties of reflection, refraction, diffraction, attenuation, resonance, superposition and standing waves. It also allows a hand-on experience with the nature of light through experiments that would help students realize concepts such as blackbody radiation, X-rays and LASERs

EBA 1107 -Quantum Physics

Prerequisites: EBA 1110– Cr. Hrs. 3

Provides students to understand the fundamental concepts within quantum mechanics to gain the necessary foundation for studying quantum computation. Topics to be covered include black body

radiation and Planck's hypotheses- photo-electric effect. Compton effect- wave properties of particles. A new model: The quantum particle- double slit experiment revisited- uncertainty principle- the wave function and probability- Analysis model: Quantum particle under boundary conditions The Schrodinger equation- Tunneling through a potential energy barrier- Applications of tunneling - Quantum harmonic oscillation- Quantum computing.

EBA 1300 -Biochemistry

Prerequisites: None – Cr. Hrs. 3

This course focuses on the study of living cells and biological molecules with an emphasis on their applications in chemical and pharmaceutical industries. Topics to be covered include cell biology and structure, fundamental biochemistry of proteins and enzymes, metabolic pathways and biosynthesis of metabolites, molecular biology including central dogma, genetic code, protein synthesis and practical examples of industrial applications.

3.2.2 Computer Science Courses (CCS)

CCS1001 – Discrete Structures

Prerequisites: CCS1101 – Cr. Hrs. 3

The course provides an introduction to mathematical structures fundamentals of computer science. Topics discussed include logic of compound and quantified statements, number theory and methods of proof, sequences and mathematical induction, set theory, counting methods, functions, relations, and graph theory. The course lays down the mathematical formulation necessary for success in the computer science field.

CCS1101 - Introduction to Computing

Prerequisites: None – Cr. Hrs. 3

This course provides an introduction to computing. It is designed to give students an understanding of how computers work, their capabilities, limitations, and applications. It includes computer architecture, systems and applications software, programming concepts, and new trends in computing. The practical part of the course introduces students to the implementation of problems' solutions using a high-level programming language.

CCS2102 – Digital Logic Design

Prerequisites: CCS1101 – Cr. Hrs. 3

This course aims to develop computer science skills in the design and analysis of digital logic circuits with applications to digital computing. It covers: Numbering systems, binary arithmetic and codes, logic gates, Boolean algebra and logic simplifications, Design and realization of combinational circuits, Functions of sequential logic circuits: Flip-Flops, analysis design and realization of counters

CCS1302- Problem Solving and Programming

Prerequisites: CCS1101 – Cr. Hrs. 3

This course provides an introduction to the problem solving process, problem solving approaches, algorithm design, and knowledge and skills in programming. Students learn how to implement problems' solutions using appropriate programming languages. Problem solving and programming concepts are emphasized and further expanded to include 2D arrays, modular programming, recursion, searching and sorting, strings, dynamic memory handling, simple and user defined data structures, file processing concepts.

CCS2103 - Introduction to Computer Architecture

Prerequisites: CCS2102 – Cr. Hrs. 3

The course includes the organization and architecture of computer systems hardware; instruction set architectures; addressing modes; register transfer notation; processor design and computer arithmetic; memory systems; hardware implementations of virtual memory, and input/output control and devices. This course exposes the student to computer design & organization. It aims for the student to understand the software/hardware interface, instructions, processor, modules & performance issues.

CCS2201 - Introduction to Networks

Prerequisites: CCS1302 – Cr. Hrs. 3

This course is an introduction to computer networks architecture and protocols with special emphasis on the Internet. The course will present the IP protocol stack including application, transport, network, and link layers. Such presentation will illustrate the main concepts, protocols, and services provided by each layer. Hands-on experience will be provided through the use of a packet sniffing and protocol analysis tool. In addition, some simple client-server network programming assignments will be presented.

CCS2303 - Object-Oriented Programming

Prerequisites: CS1302 – Cr. Hrs. 3

This course introduces students to the concepts of object-oriented programming. The concepts of classes and objects are introduced followed by a description of various types of class members. The course describes the concepts of abstraction and encapsulation and how to apply these concepts when creating classes. The course also describes the object-oriented relationships: association, aggregation, composition, inheritance and implementation. In addition, the concept and role of polymorphism are introduced covering method overloading, method overriding and dynamic method dispatching.

CCS2304 - Advanced Programming Applications

Prerequisites: CCS2303 – Cr. Hrs. 3

This course introduces the advanced features of object oriented programming through applications. Among those advanced features: file Input/Output, exception handling, multithreaded programming, building

user interfaces, database connectivity, and network programming using sockets. The course will also give a brief introduction to design patterns.

CCS2305 – Web Programming

Prerequisites: CIS2101 - Cr. Hrs. 3

This course is a comprehensive introduction of common, primarily open-source, technologies used to develop and maintain web sites on the Web. A variety of client-side and server-side technologies are covered. Students will download and install the Apache Web Server, PHP, and MySQL database. The course will cover programming concepts, client server architecture, database access, HTML, Cascading style sheets, and Javascript. Students will write a full-scale web application as their final project.

CCS2401 – Data Structures and Algorithms

Prerequisites: CCS2303 – Cr. Hrs. 3

This course covers the organization of data and algorithms that act upon them. The topics include analysis of algorithms, linked lists, stacks, queues, trees, graphs, heaps, and hashing. Algorithms manipulating data structures, like searching and sorting, memory allocation and file management are included. The concept of abstract data types is also introduced. Moreover, the course gives an introduction to algorithm design techniques.

CCS3203 - Operating Systems

Prerequisites: CCS2103 and CCS2401 – Cr. Hrs. 3

The course is an introduction to modern operating systems. Upon successful completion of the course, the student should acquire ample knowledge about the concepts, structure, design principles, implementation issues, and mechanisms of operating systems. Hands-on experience will be gained through a lab component and programming assignments. Furthermore, where appropriate, Windows, Unix/Linux will be presented as case studies of operating systems.

3.2.3 Information System Courses (CIS)

CIS1000 - Introduction to Information Systems

Prerequisites: None – Cr. Hrs. 3

This course provides an overview of information systems. Topics of interest include information system definitions, information system functions, key business functions, types of information systems, role of information in solving business problems, role of information systems in business competitive advantage, Internet business models, and e-commerce. It also aims to provide students with a broad background in multimedia information systems, including the role and design of multimedia systems that incorporate digital audio, graphics, and video. In addition, the factors affecting the adoption of cross-organizational systems, the advantages and disadvantages of virtual offices and virtual organizations, and the advantages of information systems within organizations. Additionally, the introduction of business analytics tools and concepts to improve management, organization, and business.

CIS2101 - Database Systems

Prerequisites: CCS1302 – Cr. Hrs. 3

The course covers topics related to the analysis, design, and normalization of relational databases. Case studies are analyzed and discussed on each concept. Hands on implementation skills using SQL are covered including: data definition, data modification, SQL queries and subqueries. Implementation skills are practiced on a database management system. Advanced topics such as concurrent transactions are discussed along with related problems. Students also learn about additional Data Bases support for special data types such as Extensible Mark-Up Language (XML) documents.

3.2.4 Software Engineering Courses (CSE)

CSE2001 - Introduction to Software Engineering

Prerequisites: CIS1000 and CCS2303 – Cr. Hrs. 3

Software engineering is a critically important area for the future of application and/or systems development. Students must learn about software engineering to be able to create more complex software systems. Software engineering is now such a huge area. This course

provides an introduction to software engineering disciplines with emphasis on: software life cycle, process models, requirements specification, architecture requirements, software design, rapid software development, verification, validation and testing of software. Thus, it gives students a broad view on the whole software development life cycle, and introduces techniques and standard documents used in each stage of the cycle. Moreover, during the course students undergo a team-based project with emphasis on the requirements, analysis and design phase. They use the unified modeling language as a method to model their systems.

3.2.5 Artificial Intelligence Courses (CAI)

CAI3101 - Introduction to Artificial Intelligence

Prerequisites: CCS1001 and CCS2401 – Cr. Hrs. 3

Introduction to basic methods of Artificial Intelligence (AI) such as problem solving, searching techniques, and knowledge representation. The course also discusses machine learning techniques (supervised and unsupervised learning). This is covered through discussions, projects, and examples, students learn what AI is, some of the major developments in the field, promising directions, and the techniques for making computers exhibit intelligent behavior. Students make use of available tools and explore some areas of applications.

3.2.6 Cybersecurity Courses (CCY)

CCY2001 - Introduction to Cybersecurity

Prerequisites: CCS2201 - Cr. Hrs. 3

The course introduces students to the cybersecurity field. It emphasizes the importance of securing data, information, and computer networks. Furthermore, it exposes various cybersecurity technologies, procedures, threats, vulnerabilities, countermeasures, and risk management. In addition, the course covers cryptography basics as a mechanism to implement cybersecurity services. Moreover, it highlights cybersecurity standards and sheds insights on cybersecurity for the future.

3.2.7 Non-Computing Courses (CNC)

CNC1401 - Entrepreneurship Skills

Prerequisites: 10 CR or more – Cr. Hrs: 2

This course will offer students the opportunity to imagine, develop and implement individualized and collaborative entrepreneurial strategies that will aid them in their transition from their academic career to their professional career.

3.3.Program Requirements

3.3.1 Compulsory Courses

Computer Science Courses (CCS)

CCS3403 – Computing Algorithms

Prerequisites: CCS2401 - Cr. Hrs. 3

This course introduces the mathematical design and analysis of computer algorithms. Algorithm complexity, growth of functions, recurrences will be covered. Algorithm design techniques such as divide-and-conquer, dynamic programming and greediness will be introduced. Moreover, well known algorithms for e.g., sorting, searching, graph problems and computational geometry will be developed.

Cybersecurity Courses (CCY)

CCY3002- Introduction to Cryptography

Prerequisite: CCY2001 and EBA2204- Cr. Hrs. 3

This course provides introduction to cryptographic algorithms. It focuses on how cryptographic algorithms work and how to use them. The course starts with some basic mathematics covering set theory, groups (Abelian, Cyclic, generator, group order), Rings, Fields, Euclidian algorithm, Chinese Remainder Theorem (CRT). Next, the course covers the concepts of block and stream ciphers, symmetric key encryption algorithms, public key encryption algorithm, message authentication codes, digital signatures, key management, and common examples and uses of such algorithms.

CCY3003- Digital Forensics and Incident Response

Prerequisite: CCY2001- Cr. Hrs. 3

This course introduces the major forensic processes for investigating specific cybercrime. Such processes include concepts that include studying computer procedures, gathering, analyzing, recovering, and preserving digital evidence. Technically, the topics comprise imaging,

hashing, file recovery, file system basics, identification of mismatched file type, reporting, and digital evidence methods. It also focuses on legal and other technical aspects in digital forensics and incident response.

CCY3101- Software Security

Prerequisite: CCY2001 and CSE2001- Cr. Hrs. 3

This course introduces software security basics and techniques for creating secure software applications. It covers the augmentation of software development life cycle with secure development techniques. Students will be aware of software security issues and experiment with tools and techniques for detecting and managing software security vulnerabilities.

CCY3201- Networks Security

Prerequisite: CCY3002- Cr. Hrs. 3

This course presents network security fundamentals, protocols, and practice. Topics include user authentication and federated identity management; Transport- layer security basics and protocols such as HTTPS and SSH; Wireless networks security; Email security, IP-layer security. In addition, endpoint security issues such as firewalls, intrusion detection, and malicious software will be highlighted. Finally, introduction to cloud security and IoT security will be explored. Hands-on experience will be presented through network security tools and programming assignments.

CCY4301- Cyber-Physical Systems Security

Prerequisite: CCY3201- Cr. Hrs. 3

This course introduces security issues relating to various cyber-physical systems including industrial control systems and those considered critical infrastructure systems. An introduction to secure embedded software development is presented. Next, this course will investigate key concepts behind cyber-physical systems including control systems, protocol analysis, behavioral modeling, and Intrusion Detection System (IDS) development. The course will begin with the mathematics of continuous and digital control systems and then shift the focus to the complex world of cyber-physical systems, where both a general overview for the different domains (Industrial Control, Transportation, Medical Devices, etc.) and more detailed case studies will be provided.

CCY3302- Distributed Systems Security

Prerequisite: CCY2001 and CCS3203- Cr. Hrs. 3

This course introduces distributed systems security concepts and practice. The course starts by discussing core concepts of distributed systems such as characterization and models, communication and remote invocation, consistency and replication. In addition, it discusses security protocols in distributed systems, including secure multiparty computation, access control and multi-level security, and secure distributed systems development. Finally, an introduction to mobile computing security is presented.

CCY3501- Cybersecurity Law and Ethics

Prerequisite: CCY2001- Cr. Hrs. 3

This course discusses ethical considerations for computer professionals and users. These include data protection issues, intellectual property rights, cybernetics principles (i.e., conceptual, perspective, and methodological frameworks), ethics concepts and theories, professional ethics introductions, codes of conduct, and moral responsibility. Increase. It also covers national, regional, and international laws governing cybersecurity and cybercrime. It also discusses other regulations and the impact of cybersecurity on social issues, security incidents, and cybercrime incidents.

CCY3102- Malware Analysis and Reverse Engineering

Prerequisite: CCY2001 and CCY2103- Cr. Hrs. 3

This course describes the reverse engineering principles and techniques of binary files, including static analysis, decomposition algorithms, dynamic analysis, and automated techniques for static and dynamic analysis. In addition, this course utilizes tools such as interactive disassembler (IDA) to demonstrate anti-analysis techniques, malware obfuscation, and packaging techniques.

CCY4202- Ethical Hacking and Penetration Testing

Prerequisite: CCY3201- Cr. Hrs. 3

This course demonstrates the ethical use of various "white hat" cyber penetration testing tools and techniques consistent with Ethical Hacking. It covers attacks, defense basics, race conditions, format abuses, secure coding techniques, vulnerability discovery. Additionally, it introduces the fuzzing techniques to obtain security flaws in program input, protocols, and penetration testing techniques. It will cover detailed methodologies and techniques to identify vulnerabilities, exploits, and assess security risks to networks, operating systems, and applications.

CCY4303- AI in Cybersecurity

Prerequisite: CCY2001 and CAI3101- Cr. Hrs. 3

This course blends the domains of cybersecurity and Artificial Intelligence (AI). This course presents artificial intelligence principles use for cybersecurity-related applications. It starts by discussing various neural network architectures as Artificial Neural Networks (ANN), Convolutional Neural Networks (CNN), and Generative Adversarial Networks (GAN). Additionally, it covers AI techniques for detecting patterns, model behaviour, and identify anomalous behaviour. Topics include detecting spam, phishing, malware threats, and network anomalies through AI techniques. In addition, attacks and defences for GANs. Moreover, it explores machine learning for fraud detection.

CCY4401- Cybersecurity Risk Management

Prerequisite: CCY2001- Cr. Hrs. 3

This course covers risk management principles, frameworks, and techniques that can be explicitly applied to cybersecurity. In addition, it will teach students how to identify, assess and articulate risk and options available for treating risk and which may be most appropriate for their situation. The course provides the skills relating to threat modeling. Additionally, this course provides a set of tools, samples and techniques that can be used to successfully implement and maintain a risk management framework within an organization.

CCY4901 – Project I

Prerequisites: 90 Cr. Hrs. or more & GPA $\geq$ 2.0 - Cr. Hrs. 3

The graduation project challenges students to go beyond the learning skills and knowledge they obtained from their educational program by developing projects that demonstrate their intellectual, technical and creative abilities. Students shall complete their projects in areas of concentrated study under the direction and supervision of faculty members. Project I will demonstrate the students' ability to identify a problem domain, define the problem, conduct analysis of current

related projects/ commercial tools/ research, identify and specify requirements, perform analysis and design for the proposed solution.

CCY4902 – Project II

Prerequisites: CSE4901 - Cr. Hrs. 3

In Project II students are expected to apply, demonstrate and integrate comprehensive knowledge acquired across various undergraduate courses. The successful completion of graduation project is an indication of the students' preparedness to pursue a professional career. Students are expected to make significant progress based on project I and show their ability to implement and evaluate a computer- based solution by using appropriate tools and techniques along with producing the appropriate documentation.

3.3.2 Elective Courses

Data Security

CCY4004- Advanced Digital Forensics

Prerequisite: CCY3003- Cr. Hrs. 3

This course presents advanced digital forensics models and methodologies for finding evidence on various digital devices (computers, networks, mobile phones and more). Additionally, it discusses the science and law related to digital forensics, the verification of results, and the identification of acceptable and irrefutable evidence in court. Moreover, it assesses different models of digital forensic for data identification, retention, collection, testing, analysis, preparation, and presentation.

CCY4005- Advanced Cryptography

Prerequisite: CCY3002- Cr. Hrs. 3

This course provides advanced topics in cryptography. Topics include interactive proofs, secure protocols, zero-knowledge proofs, non-interactive zero-knowledge proofs, two-party secure computation, homomorphic encryption, multiparty secure computation, key

ratcheting, and quantum cryptography. Other topics may be covered such as fingerprinting, steganography, and digital watermarking.

CCY4006-Multimedia Security

Prerequisite: CCY3002- Cr. Hrs. 3

This course introduces multimedia security fundamentals, techniques, and protocols. It presents background such as multimedia compression technology and standards. In addition, it explores multimedia cryptography, steganography, watermarking, multimedia authentication and forensics, authentication via biometrics, and digital surveillance and applications. Hands-on experience will be provided through the use of software tools and programming assignments.

Software Security

CCY4103- Blockchain and Applications

Prerequisite: CCY3002- Cr. Hrs. 3

This course provides theoretical and practical aspects of blockchain technology and its applications. The student will be exposed to concepts such as related data structures, blockchain challenges, transaction processing, consensus, and blockchain layers, while also developing blockchain solutions. The course will result in the necessary knowledge to enable the student to assess and evaluate the use of blockchain technology in software applications. Case studies of existing blockchain frameworks will be presented along with hands-on experience.

CCY4104- Web Security

Prerequisite: CCS2305 and CCY2001- Cr. Hrs. 3

This course introduces students to web security and provides techniques for building secure web applications. In addition, it covers secure web programming concepts, web vulnerabilities and their

exploitation, web browser design flaws, and some advanced web privacy topics.

CCY4105- E-business Security

Prerequisite: CIS1000 and CCY2001- Cr. Hrs. 3

The course covers the technologies, concepts, issues, and principles essential in designing and implementing a secure e-commerce system. Topics include a discussion of fundamental security principles and issues, policies, payment systems, and standards particular to secure e-commerce applications. In addition, it presents how to analyze the vulnerabilities of a given system and make recommendations for enhancements. Moreover, security challenges and issues for mobile e-business platforms, cloud-based e-business solutions are explored.

Network Security

CCY4203- Internet of Things Security

Prerequisite: CCY3201- Cr. Hrs. 3

This course presents Internet of Things (IoT) security concepts and practice. It starts by discussing IoT architecture, design and standards as well as security requirements and engineering for IoT. It describes various cyber-attacks on IoT devices and how to protect them. Therefore, this course explores the attacks targeted on connected devices, device-to-device (D2D) security and privacy, device authentication, device encryption/decryption technologies, and more with IoT systems. Furthermore, trust and privacy in IoT are explored.

CCY4204- Advanced Penetration Testing

Prerequisite: CCY4202- Cr. Hrs. 3

This course presents advanced topics in penetration testing. It includes topics discussing advanced web application attacks, hand-crafted multi-stage and non-tool-based attacks, layer two attacks, social engineering, stealth, exploit generation and delivery, physical attacks, insider attacks, negotiating appropriate rules of engagement and managing legal risk, reporting and ethical professional frameworks for advanced penetration testing and red teaming.

CCY4205- Wireless Networks Security

Prerequisite: CCY3201- Cr. Hrs. 3

This course focuses on security issues and protocols in wireless networks (wireless LANs/PANs, vehicular network systems, wireless sensor networks, and RFID systems). Topics include Wireless LAN, Bluetooth, Zigbee, and RFID security protocols. In addition, penetration testing concepts and tools for wireless networks are introduced. Moreover, wireless sensor networks security issues and frameworks are explored. Finally, security in vehicular communications is discussed and explored.

System and Component Security

CCY4304- Operating Systems Security

Prerequisite: CCY2001 and CCS3203- Cr. Hrs. 3

This course presents various security-related operating systems principles and practice. It describes OS-level mechanisms and policies for investigating and protecting computer systems against attacks such as buffer overflow attacks. It discusses access control fundamentals and case studies. In addition, OS Kernel security mechanisms are described with case studies. Moreover, OS security techniques such as system call monitoring and memory protection are considered for advanced approaches such as system-level

randomization and hardware virtualization. Finally, Mobile OS security is presented along with case studies.

CCY4305- Advanced Malware Analysis and Reverse Engineering

Prerequisite: CCY3102- Cr. Hrs. 3

This course covers superior tactics for detecting the presence of vulnerabilities in binary software program and its evaluation of malicious software programs. It explores current studies and unsolved troubles in software program safety and forensics. This course aims to interact in crucial dialogue around critical software program protection and forensics (Binary Software Security, Binary Program Analysis Principles, Cyber Attack Response and Software Forensics). The course covers static and dynamic tools to develop a hybrid approach for effectively analyzing malware including assembly level debuggers, disassemblers, decompilers and sandboxes.

CCY4307- Cloud Computing Security

Prerequisite: CCY2001 and CCY3203- Cr. Hrs. 3

This course introduces Cloud Computing security concepts and practice. It starts by providing the essential concepts and principles for cloud landscape and architecture, including design patterns, and practical case studies. Next, this course discusses security approaches for the cloud landscape (i.e., architecture, design patterns, industry standards, regulatory compliance requirements, and management services). Additionally, it presents how to identify and mitigate risks, applying isolation and protection on both physical and logical infrastructures such as network, computers, storage, data protection for OSI layers, end-to-end identity, and access control, monitoring and auditing practices for effective compliance with industry and regulatory mandates. Finally, the course explores security guidelines for cloud computing in International Organization for Standardization (ISO), National Institute of Standards and Technology (NIST), European Network and Information Security Agency (ENISA), and Cloud Security Alliance (CSA).

Organizational Security

CCY4402- Cybersecurity Policy and Governance

Prerequisite: CCY2001- Cr. Hrs. 3

This course gives overview for various aspects for cyber-security policy development, governance structures, policy selection and implementation, auditing, and control mechanisms to assure compliance and efficacy. In addition, the students will learn about various legal considerations involved in formulating and managing such policies, cybercrime, intellectual property, cyberwarfare, and the homeland security (i.e., critical infrastructure protection). They will also be exposed to various technical issues that can be utilized in developing effective national and international policies related to cyberspace. It covers how to analyze policies thoroughly, identify their weaknesses, then compare and contrast them, and recognize the significance of training and compliance in information security risk management. The course highlights the transdisciplinary impacts and issues that must be addressed in designing or putting into practice successful national cybersecurity laws and policies.

CCY4403- Cyber Threat Intelligence

Prerequisite: CCY2001- Cr. Hrs. 3

This course explores latest techniques and technologies related to cyber threat intelligence. In addition, it will help students understand various sources of threat intelligence, creating a novel cyber-threat intelligence platform; employing analytics techniques on traditional intelligence data feed and hacker community datasets (e.g., Hacker Forums, IRC channels, DarkNet marketplaces). In addition, it enables the students to identify and collect intelligence feeds from various sources, such as the Common Intelligence Model (CIF's), Trusted Automated eXchange of Intelligence Information (TAXII), and Security Information and Event Management (SIEM).

Human and Societal Security

CCY4502-Usable Security

Prerequisite: CCY2001- Cr. Hrs. 3

This course will examine how to design for security and privacy from a user-centered perspective by combining insights from computer systems and human-computer interaction (HCI). The student will learn about core security and privacy technologies, as well as HCI techniques for conducting robust user studies. The course covers topics including usable authentication, user-centered web security, anonymity software, privacy notices, security warnings, and data-driven privacy tools in domains ranging from social media to the Internet of Things.

3.3.3 Professional and Practical Training Courses

CIT3200 - Professional Training in Mobile Apps Programming

Prerequisites: None - Cr. Hrs. 0

This course provides programming technologies, design and development related to mobile applications. Topics include accessing device capabilities, industry standards, operating systems, and programming for mobile applications using an OS Software Development Kit (SDK).

Chapter

4

4. COURSE FILE SUMMARY

ADMISSION EXAM ENGLISH PROFICIENCY

GLA0001 Remedial English

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	2	0	0

COURSE AIM

1. Use the four language skills
2. Communicate ideas effectively
3. Write simple sentences
4. Follow the principles and stages of the writing process of a coherent paragraph
5. Manage their time effectively
6. Work effectively in a group or team to achieve goals.

COURSE WEEKLY CONTENTS

- 1 Orientation + Reading Comprehension
- 2 Writing "Sentences"
- 3 Writing "Sentences" + Module 1 "Video-viewing" + Module 1a "Reading Comprehension"
- 4 Module 1b "Vocabulary" + Workbook & Module 1e "Giving Directions" + Workbook
- 5 Module 1c "Present Simple" + Workbook + Module 1d "Listening"
- 6 Module 2a "Reading Comprehension" + Revision
- 7 Module 2 "Video-viewing" + Module 2d "Listening"
- 8 Module 1c "Present Continuous" + Workbook + Module 2d "Listening"
- 9 Module 2b "Vocabulary" + Workbook & Module 3e "Making Suggestions" + Workbook
- 10 Module 2c "Past Simple" + Workbook + Module 3d "Listening"
- 11 Module 4d "Listening" + Pre-writing techniques + Writing "Pre-writing techniques"
- 12 12th week exam + Module 3b "Vocabulary" + Workbook
- 13 Module 2c "Past Continuous" + Workbook + Tense Review
- 14 Module 4a "Reading Comprehension" + Video-viewing
- 15 General Revision + Question and Answer Session

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

- Textbook**
- J. Dooley and V. Evans, On screen: Student's book B1, Express Publishing.
 - J. Dooley and V. Evans, On screen: Workbook & grammar book B1, Express Publishing

4.1.University Requirements

4.1.1.Compulsory Courses BY UNIVERSITY

UNR2101 Communication and Presentation Skills

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
UNR1403	1	2	1	3		2

COURSE AIM

By the end of the course, learners will be able to:

1. understand the essential components of effective communication.
2. recognize flaws in their communication style.
3. outline the topic and content of a persuasive oral presentation.
4. identify the essential components of a business meeting.
5. understand the essential components of a business interview.
6. practice technical writing skills.

COURSE WEEKLY CONTENTS

1. Introduction to communication skills
2. Communication Principles and Processes; The Oral Communication Process: Speaking and Listening
3. Elements of successful communication; Nonverbal communication
4. Introduction to presentation skills
5. Persuasive presentations
6. project
7. Introducing Interviewing Skills
8. Interviewing skills
9. Interviewing skills (cont'd)
10. Graded interviews
11. Group Communication: Preparing for and conducting meetings.
12. Meeting agendas and meeting minutes
13. Conducting Meetings
14. Graded meetings
15. Revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Johnson-Sheehan, R., *Technical communication today*, Pearson

UNR1403 Academic English**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	1	3	--	2

COURSE AIM

- read and understand English texts in different contexts.
- recognize and distinguish between the different reading skills of skimming and scanning
- use inferencing and reading strategies appropriately.
- identify contextual reference.
- understand spoken language in context.
- distinguish between listening for gist and specific information and/or details.
- memorize vocabulary used in different real life situations and be able to use learnt vocabulary items to discuss related issues.
- use the four language skills effectively
- participate in group work to achieve goals.

1. Orientation + Icebreaking Activities + Phonetic Games
2. Unit 1 (A) + Unit 1 (C) + Reading Comprehension
3. Phonetic Games + Unit 1 (D) + Video Viewing Sheet (Unit 1 A + Unit 1 B)
4. Phonetic Games + In-Class Project: Profiling: Profile Your Role Model + Life Maps + Unit 2 (A)
5. How to read, write and present a story (Listening + Grammar) + Reading Comprehension Practice
6. Unit 2 (B) + 2 (C) + Reading Comprehension + Song: "Remember me" (From Movie: Coco) +
7. Check & Reflect: Students' Book + 7th Week Assessment Human Resources
8. Notices and Advertisements+ In-Class Projects: Make an ad. & present it to your class. + Develop your writing: Write short notes.
9. Unit 4 (A) + Unit 4 (B) + Song: Ka Ching (by Shania Twain)+ Poster Presentation about a Brand /a Franchise/ a Product / Service, etc.
10. Phonetic Games + Unit 4 (C) + Unit 4 (D) + Write a Movie Review + Video Viewing Sheet+ Unit 10: An Actor's life. + Reading Comprehension
11. Develop Your Listening: Understanding Radio Programs + Unit 5 (B) + Unit 6 (A) + Reading Practice: Do You Live in a Burglary-Friendly House?
12. Check & Reflect Sheets Students' Book + Introduce Final Project+ Video Viewing: Unit 9 (Chainsaw Art) + 12th Week Quiz
13. Unit 6 (C) + Unit 8 (C) + Environmental Awareness Bumper Stickers + Review Final Project
14. Delivering Final Projects
15. Reading Comprehension Sheet: Jane Goodall+ Questions and Answers Session

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Berlís, M. & Jones, H., Roadmap B1: Student's book. PEARSON EDUCATION

UNR1407 Academic Writing**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
UNR1403	1	2	1	3	--	2

COURSE AIM

- enhance students' academic writing skills
- introduce various genres of academic essays
- examine the constituents of academic paragraphs and essays
- master the skills of summarizing, paraphrasing and documenting

COURSE WEEKLY CONTENTS

1. Course Aim, Course outline, Course Orientation + free writing workshop
2. Different types of sentences + pre-writing stages
3. Paragraph Structure + guided practice
4. Unity and Coherence + guided practice
5. Quiz 1 (graded workshop) + Academic Essay: introduction
6. Academic Essay: introduction (cont.) + guided practice
7. 7th week Assessment
8. Academic Essay: body and conclusion
9. Essay writing practice + Process Essay
10. Cause/effect Essay + guided practice
11. Compare/Contrast Essay + guided practice
12. 12th week assessment + – introducing final writing assignment
13. Paraphrasing, summarizing and source documentation
14. Argumentative Essay + guided practice
15. Final writing assignment (workshop)

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Oshima, A., Hogue, A., & Ravitch, L., Longman academic writing series: Essays. Pearson Education

4.1.2.ELECTIVE COURSES BY UNIVERSITY (COLLEGE COMPULSORY)

UNR1302 Fundamentals of Business

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	-	--	2

COURSE AIM

- Conduct business in the global economy.
- Start and expand a small business.
- Manage a business, information systems, and production.
- Manage employees.
- Develop marketing strategies to satisfy customers.
- Manage accounting and financial resources.

COURSE WEEKLY CONTENTS

1. The U.S Business Environment
2. Business Ethics and Social Responsibility
3. Entrepreneurship, New Ventures, and Business Ownership
4. Business Management
5. Organizing the Business
6. Operations Management and Quality part I
7. Operations Management and Quality part II
8. Employee Behavior and Motivation
9. Leadership and Decision Making
10. Leadership and Decision Making (cont.)
11. Human Resources Management and Labor Relations
12. Projects
13. Human Resources Management and Labor Relations (cont.)
14. The global context of business
15. Review

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30		MARKS	→	30
8 to 12	←		20		MARKS	→	20
1 to 15	←		10		MARKS	→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Ronald J. Ebert and Ricky W. Griffin; Business Essentials, Pearson

4.1.3. Elective Courses

UNR1102 Creativity and Innovation

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	0	2

COURSE AIM

Creativity and innovation are integral to a student's ability to survive and thrive in professional environment. This course provides students with an understanding of how creativity, innovation and adaptability function in computing designs. Students will learn how to cultivate creativity, innovation and adaptability in themselves, others and the organizations in which they live and work. Students will also explore how and why innovations succeed or fail. Theoretical conceptualizations of creativity, innovation and adaptability, as well as practical applications involved in fostering creativity, innovation and adaptability will be explored. Students will be expected to play an active role in learning through class exercises, class discussions, and presentations about real creative projects.

COURSE WEEKLY CONTENTS

1. Theoretical elements
2. Different aspects of creativity
3. Development of cognitive abilities
4. Influential factors (environmental, social, personal, organizational)
5. Creativity approaches (methods, techniques, activities)
6. Metacognitive processes
7. 7th week assessment.
8. Mind-mapping, six hats, SCAMPER, bionics
9. Examples and projects
10. Marketing, improvisation and invention
11. Encoding information
12. 12th week assessment.
13. Concept map
14. Vee diagram
15. Final revision.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook David Cropley, "Creativity in Engineering: Novel Solutions to Complex Problems", Academic Press

UNR1103 ICT Skills**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	0	2

COURSE AIM

Introducing students with Computer Applications, ICT Skills and impact of ICT on various sectors. Digital Transformation and Information Technology at the edge of 4th Industrial Revolution and Ethics of Technology. Data presentation, processing, Big Data Volumes, new technology for data storage handling and principles of Artificial intelligence in various Engineering Sectors. Learn Web-Development, websites building tools and Web-Search Skills. Creating generative forms, GUIs Graphical user interfaces. Creating Database Files and GUIs links with Database handling Tools and application case studies in various Engineering problems. Fundamentals of Mobile Applications, needs, development tools and application case-studies.

COURSE WEEKLY CONTENTS

- 1 Introduction on Computer Applications, ICT Skills and impact of ICT on various community services, marketplace, educations and other sectors.
- 2 Digital Transformation and Information Technology at the edge of 4th Industrial Revolution and Ethics of Technology.
- 3 New Technologies on computer-based aided-design and Computer-based Design Tools
- 4 Data presentation, processing, Big Data Volumes, new technology for data storage handling and principles of Artificial intelligence
- 5 HTML Basics -Learn Web Development and Web-Search
- 6 Web-site Building Fundamentals and Web-site Building Tools.
- 7 7th Week assessment.
- 8 Excel Spread Sheets, Formulas, statistics & Charts and generative sheets.
- 9 Creating generative forms, GUIs Graphical user interfaces.
- 10 Creating Database Files and GUIs links with Database handling Tools
- 11 Computer Drawing and graphical Design Tools
- 12 12th Week assessment.
- 13 Graphics visual representation, Computer software tools, Presentation skills.
- 14 Fundamentals of Mobile Applications, needs, and application case-studies.
- 15 Mobile App development Tools, building blocks and creating Mobile GUIs.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Daniel Cohen et al., "The ICT Revolution: Productivity Differences and the Digital Divide", Oxford University Press
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UNR4201 Professional Ethics and Practice Law**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
90 Cr. Hr.	4	8	2			2

COURSE AIM

To get the students familiar with the engineering ethics from point of view of professionalism, codes of ethics, moral frameworks, engineering as social experimentation, safety/risk, workplace, honesty, environmental and global issues, examples of codes of ethics, case-studies

COURSE WEEKLY CONTENTS

- 1 Introduction to the course Ethics and Professionalism
- 2 Moral Reasoning and Codes of Ethics
- 3 Moral Frameworks
- 4 Engineering as Social Experimentation
- 5 Commitment to Safety
- 6 Workplace Responsibilities and Rights
- 7 Honesty
- 8 Environmental Ethics
- 9 Global Issues
- 10 Engineers and Technological Progress
- 11 General Resources on Engineering Ethics
- 12 Examples of Codes of Ethics (ABET, IEEE, etc.)
- 13 Preparation for the Professional Practice Exam (PPE), a requirement for students who want to become professional engineers.
- 14 Case Studies
- 15 Case Studies

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Martin M.W., Schinzinger R., *Ethics in Engineering*, McGraw-Hill, NY

UNR4301 Introduction to Entrepreneurship**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
112 Cr. Hr.	5	9	2	0	0	2

COURSE AIM

The course aims to introduce the students how to successfully start their own businesses, write a business plan and to inspire young entrepreneurs. This course provides a broad overview on the important topics of entrepreneurship that make students learn how to be entrepreneurs and overpass the difficulty of launching their own business.

COURSE WEEKLY CONTENTS

- 1 Introduction to Entrepreneurship
- 2 Feasibility Analysis
- 3 Developing an Effective Business Model
- 4 Developing an Effective Business Model
- 5 Writing a Business Plan.
- 6 Writing a Business Plan.
- 7 Preparing the Proper Ethical and Legal Foundation
- 8 7th week assessment.
- 9 Financial Planning: Getting Financing or Funding.
- 10 Managing the cash flow.
- 11 Unique Marketing Issues.
- 12 Ecommerce and Pricing
- 13 12th week assessment.
- 14 Franchising.
- 15 Building a New-Venture Team.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Norman M Scarborough Jeffrey R. Cornwall, Essentials of Entrepreneurship and Small Business Management, Pearson
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UNR2303 Engineering Economy**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	2	4	2	0	0	2

COURSE AIM

This course aims at the study of basic concepts emphasizing analysis of aggregate economy and examination of the processes of price determination and calculation of optimum demand for maximum profit. It also introduces the basic principles of money-time relationship, methods of investment assessment and fundamental techniques of comparison of investment opportunities and theories of depreciation of physical facilities and study of cost recovery systems.

COURSE WEEKLY CONTENTS

- 1 Introduction and overview.
- 2 Cost Analysis.
- 3 Principles of money – time relations, the concept of economic equivalence.
- 4 Cash flow diagrams: Interest formulas and uniform series.
- 5 Cash flow diagrams: Uniform gradient series
- 6 Nominal and effective interest rates, continuous compounding and continuous cash flows.
- 7 7th Week assessment+ Applications of engineering economy..
- 8 Applications of engineering economy: Methods of investment assessment (1).
- 9 Applications of engineering economy: Methods of investment assessment (2).
- 10 Comparing alternatives: Useful life is equal to the study period..
- 11 Comparing alternatives: Useful life different from the study period.
- 12 12th Week assessment + Depreciation.
- 13 Depreciation.
- 14 Evaluating Projects with Benefit-to Cost ratio Method.
- 15 Revision.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook William G Sullivan, Elin M Wicks, & C. Patrick Koelling, "Engineering Economy" Prentice Hall.

UNR2304 Introduction to Leadership**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	2	4	2	0	0	2

COURSE AIM

The course will help students to understand the evolving nature of leadership. It will introduce different concepts, theories and how leaders differ from managers. The course will highlight how employees' behavior provides a major challenge for leaders. How leaders learn to take advantage of individual differences, group diversity, intergroup conflicts to improve organizational performance and effectiveness. An integral part of this course is to develop students' skills to analyze different successful and charismatic leaders existing in real life and in real organizations through case studies and discussions.

COURSE WEEKLY CONTENTS

- 1 The nature and importance of Leadership
- 2 Leadership: Past, Present and Future
- 3 Motives, and Characteristics of Leaders
- 4 Leadership Traits Approach
- 5 Behavioral Leadership Approach
- 6 Situational and Contingency Approaches to Leadership
- 7 Charismatic, and Transformational Leadership
- 8 Authentic and Servant Leadership
- 9 Effective vs. Ineffective Leaders (Formal and Informal leadership examples)
- 10 Leadership Development
- 11 Emerging Issues in Leadership
- 12 Leadership and Culture
- 13 Leadership and Gender
- 14 Leadership and Ethics
- 15 Revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Northouse, P.G., "Introduction to Leadership: Concepts and Practice", SAGE Publications.

UNR2305 Contemporary Issues in Society Business & Economics**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	2	4	2	0	0	2

COURSE AIM

This course exposes students to in depth knowledge of current global issues in Business and Economics, under the current situation of globalization.

COURSE WEEKLY CONTENTS

- 1 Economic Growth Vs. Economic Development.
- 2 Economics and Environment.
- 3 Inflation and the Measurement of Prices.
- 4 The Power and Limits of Market.
- 5 The Economics of Illegal Drugs.
- 6 The Economics of Health Care.
- 7 The Economics of Health Care (Cont.)
- 8 Poverty and Distribution of Income.
- 9 The Economics of Global Agreements.
- 10 International organizations.
- 11 Immigration and the International Trade of Labor.
- 12 Term Paper Discussions.
- 13 Foreign Exchange and International trade of Money.
- 14 Foreign Exchange and International trade of Money (Cont.)
- 15 Revision.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Vishwakarma, V. et al., Contemporary Issues in Business, Economics, and Society (Vol-II). Red Shine Publication PVT. LTD.

UNR1306 Basics of Logistics Management**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	0	2

COURSE AIM

The aim of the course is to understand the fundamental practices of business logistics and focus on the development which has seen the transition of logistics from being perceived in a purely functional way to the modern view of management oriented, holistic supply chain management. Moreover, it helps the students to know the importance of logistics in the context of public business management and define the basic concepts of logistics.

COURSE WEEKLY CONTENTS

- 1 Overview about Logistics.
- 2 Principles of Logistics - Part (1).
- 3 Principles of Logistics - Part (2).
- 4 Logistics Activities.
- 5 Logistics System and Infrastructure.
- 6 Logistics Services.
- 7 Logistics Organization and Control.
- 8 IT in Logistics.
- 9 Strategic Logistics.
- 10 Financial Logistics.
- 11 Business Models.
- 12 Logistics Solutions.
- 13 Logistics Network Planning.
- 14 International Logistics.
- 15 Revision.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Murphy P. R. and Knemeyer, A. M., Contemporary Logistics, Pearson.

UNR1401 Introduction to Mass Communication**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	2	2	0		2

COURSE AIM

This course is designed to give students basic information on the nature and history of mass media. It introduces students to the concept of communication, approaches to the media as well as media form and content. The course also touches upon types of mass media, including print media, radio and television, the new media, The students are exposed to crucial areas such as public relations, advertising, censorship and freedom of speech.

COURSE WEEKLY CONTENTS

- 1 Introduction to the course – Introduction to media (Understanding the media).
- 2 Communication Process, types & barriers of communication
- 3 Public Speaking Art (skills of writing public speech and skills of performing)
- 4 Printed Newspapers(history, organizational system, types, and writing characteristics)
- 5 Magazines (content types & designs)
- 6 Online journalism (advantages & disadvantages, effects on traditional journalism)
- 7 7th assessment (written exam & speech performance record)
- 8 Radio (history, development, types of content, online radio)
- 9 Television (history, development, programs types)
- 10 Introduction to Public relations (definition, techniques & applications)
- 11 Advertising (definition, types, case studies)
- 12 12th assessment (project on Adobe Premier program)
- 13 Advertising appeals / feedback on the 12th assessment
- 14 Social marketing (definitions, techniques, case studies)
- 15 Final revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Stanley Baran, Introduction to Mass Communication: Media Literacy and Culture, McGraw Hill

UNR1605 History of Engineering and Technology**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	2	2	-	-	2

COURSE AIM

This course involves the student in over grasping the history and development of engineering sciences. Describe the history of Engineering. Compare and contrast the different branches of Engineering. Identify the career opportunities and education and training requirements.

COURSE WEEKLY CONTENTS

- 1 Definitions of art, science, technology and engineering
- 2 The Relation of Art, Science and engineering
- 3 History of industrial revolution
- 4 History of second industrial revolution
- 5 History of information Revolution
- 6 Environmental engineering history and advances
- 7 Social involvement in technological advances / 7th week Assessment +
- 8 Branches of engineering Overview
- 9 Contrast of the different branches of Engineering
- 10 Career opportunities in Engineering branches
- 11 Environmental engineering history and advances
- 12 12th week Assessment + Examples on development of engineering activities
- 13 Examples on development of engineering activities (cont.)
- 14 Energy situation in Egypt – Energy balance.
- 15 Energy alternatives in Egypt.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Ervan Garrison, A History of Engineering and Technology Artful Methods, Routledge
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UNR1501 Art Appreciation**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	0	2

COURSE AIM

A work of art produces an agreeable impression as processing aesthetic beauty which is the result of the satisfaction of the mind and the stimulation of our senses. A combination between a successful design and computing ethics is a one of the course aims. Computing students will be expected to conduct themselves in an ethical manner at all times. Understanding the essential role of art in our lives.

COURSE WEEKLY CONTENTS

1. Introduction to fine Arts
2. Art in our lives
3. The Basic Meaning of Art Explained- Line
4. Design elements: Shape and Form
5. Design elements: Space
6. Design elements: Texture and pattern – Value Part I
7. Design elements: Texture and pattern – Value Part II
8. Design elements: Color psychology
9. Color theory
10. The Principles of Design: Balance- Emphasis -
11. Contrast- Repetition Part I
12. Contrast- Repetition Part II
13. The Principles of Design : Proximity- Proportion
14. Harmony- Unity & Variety
15. Final presentation

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	• Education Craft & Technology, Trentham Books, London.
	• Robin Jesson, Handbook For Art And Design Students.
	• Jennifer L. Atkinson. Collage art: a step-by-step guide & showcase, Rockport Publishers, Cincinnati, Ohio.
	• Brigadier, Anne. Collage: a complete guide for artists, Watson-Guption Publications, New York.

UNR1503 Music and Civilization**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	0	2

COURSE AIM

This course provides the student knowledge with musical vocabulary and common architectural terms. It enhances the student's practical skills in the field of identifying classical music, with emphasizing on understanding the different types of musical eras. It aims at providing the student with the main knowledge of music vocabulary and understand the types of musical eras.

COURSE WEEKLY CONTENTS

1. Introduction: Music & Civilization Definitions: Music, Sound, Pitch, Dynamics, Timbre (Voices And Instruments). Basic Elements Of Music: Melody, Harmony (Consonance & Dissonance, Key, Scale), Rhythm (Beat, Meter, Tempo, Accent, Syncopation), Texture (Monophonic, Polyphonic & Homophonic) And Form (Binary, Ternary.)
2. MUSICAL STYLES: Introduction ANCIENT MUSIC: Egyptian, Mesopotamian Greek And Roman Music.
3. Western Classical Music: Medieval, Renaissance, Baroque, Classical, Romantic
4. MEDIEVAL PERIOD (450-1450) Historical Events: Sack Of Rome By Vandals, Reign Of Pope Gregory I, Crusades, 100 Years War.
5. Social And Cultural Background: Feudal System: Nobility, Peasantry And Clergy.
6. THE RENAISSANCE PERIOD (1450-1600)
7. THE BAROQUE PERIOD (1600-1750): Historical Events: Scientific Advances, Galileo, Newton. Social And Cultural Background: Age Of Absolutism.
8. Characteristics Of Baroque Music.
9. THE BAROQUE PERIOD (1600-1750): II
10. 7th Week Assessment, Continuation Of The Previous Lecture And Evaluation.
11. The CLASSICAL PERIOD: Historical Events: The Invention Of Steam Engine. American And French Revolutions, Napoleonic War.
12. The CLASSICAL PERIOD: II
13. ROMANTIC PERIOD (1820-1900) Historical Events
14. ROMANTIC PERIOD (1820-1900) II
15. Continuation Of The Previous Lecture And Evaluation.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook KAMIEN Roger- Music: An Appreciation, Mc Graw Hill- New York.
POGUE David & SPECK Scott- Classical Music for dummies- Wiley Publishing, Inc-USA.

UNR1502 History of Egyptian Art**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	0	2

COURSE AIM

To provide a survey of Egyptian art from the predynastic period to the contemporary period, highlighting all main phases in between, including Graeco-Roman and Late Antique art, early Islamic, Mamluk, Ottoman, and the main 19th and 20th century trends and styles. The course aims at introducing the students to the most eminent Egyptian artists and art works, providing an account for historical, socio-cultural elements that influenced art theory and practice in Egypt. It also aims at introducing students to different methodologies in the study of the history of art while engaging them in different activities.

COURSE WEEKLY CONTENTS

1. Introduction. Course objectives, content, methodology, expectations, terminology, chronological overview.
2. Ancient Egyptian Art: Natural and social contexts. Composition, conventions, materials, patterns, colours, influences.
3. Ancient Egyptian Art, continued. Art in the Amarna Period.
4. Graeco-Roman Egypt: Art in the Ptolemaic period.
5. Ancient Egyptian Art: The rediscovery of Egyptian art in the 19th century. Reception of ancient Egyptian art in the modern world. Egyptomania. Egyptian Revival styles.
6. Coptic (Late Antique) Egypt: The rise of Christianity. Coptic art: conventions, details, and patterns.
7. Islamic Egypt: Principles and meanings of Islamic geometric design. Exercise with patterns.
8. 7th week Assessment
9. Islamic Egypt: Art in Mamluk Egypt and Ottoman Egypt.
10. Modern Egyptian Art: 19th and 20th century art: Socio-political context.
11. Modern Egyptian Art: Pioneer artists (1).
12. Modern Egyptian Art: Pioneer artists (2).
13. Trends in Egyptian Contemporary Art (1945-2000).
14. Trends in Egyptian Contemporary Art (1945-2000), continued.
15. Overview Discussion

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Hewitt, Jim. Egypt: *Visual Sourcebook for Artists, Architects, and Designers*. AUC Press.

UNR1601 Climate Change and Water Management**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	0	2

COURSE AIM

The objectives of the course is to contribute to reducing the vulnerabilities of people and societies to shifts in hydro-meteorological trends, increased variability and extreme events. This training course will focus on managing risk and dealing with uncertainty on climate change on water resources through various measures, including monitoring known hazards and risks, reducing the unknown risks through system research, and determining the range and type of relevant uncertainties. The course will also focus on the identification of adaptation measures with particular emphasis on droughts. It will also cover the important need to protect and restore ecosystems that provide critical land and water resources and services. The course will further discuss the need to close the gap between water supply and demand and to resolve water resources conflicts.

COURSE WEEKLY CONTENTS

- 1 Importance of Water for Economic Development
- 2 Climate Change, Its Drivers and impacts
- 3 Climate Change Mitigation and Adaptation
- 4 Climate Change Vulnerabilities and Risk Assessment
- 5 Water and Climate Change - Current Challenges
- 6 Introduction to Water resource Management and International Frameworks for IWRM
- 7 Water Supply and Distribution
- 8 Sources of Water and Minimizing Water Loss
- 9 Water Scarcity - Predictions and Preparedness
- 10 Safe Wastewater Reuse, Treatment and Recycling
- 11 Projections of future climate change impacts on the water cycle
- 12 Strategy Development and Planning for Adaptation
- 13 Technologies for addressing adaptation challenges
- 14 Climate Change Impacts on Agriculture and Drought Risk Management
- 15 Conflict issues in water resources management and water rights

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Climate Change and the Sustainable Use of Water Resources, Walter Leal Filho, Springer

UNR1602 Sustainable Development**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	--	2

COURSE AIM

To make the students familiar with an understanding of the social and environmental responsibilities of ICT professionals and the role of sustainability in ICT design and product life cycles, and advance the body of knowledge related to appropriate technologies in both Canada and in developing regions of the world. The course hopes to improve education resources and technology transfer to increase the effectiveness of student projects working towards the United Nations Millennium Development Goals. Students will also improve their problem solving ability, written and oral communication, and teamwork skills.

COURSE WEEKLY CONTENTS

- 1 Introduce students to the fundamental concepts of computing for sustainability and sustainable development.
- 2 ICT for sustainability and sustainable development.
- 3 Aspects of appropriate technology.
- 4 Green ICT.
- 5 Resource conservation.
- 6 Renewable resources.
- 7 7th week Assessment + Design for extreme affordability.
- 8 Introduce students to a range of computing problem solving methods.
- 9 Methods to identify and select sustainable solutions to design problems.
- 10 Methods of improving existing ICT solutions.
- 11 Methods of systems thinking.
- 12 12th week Assessment +
- 13 Technical, economic, and social consequences of ICT practices and processes.
- 14 To better delineate the complex ICT decisions related to social and environmental issues.
- 15 Assist students in the application of science and innovation to meet human needs while indefinitely preserving the life support systems of the planet.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17	Final Exam						40

REFERENCES

Textbook	Mulder, K., "Sustainable Development for Engineers, a Handbook and Resource Guide", Routledge
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UNR1402 Arabic Language**COURSE INFORMATION****COURSE AIM**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	0	2

The course aims at linking the Arabic language to the students' needs and various majors / specializations through ensuring that the course content and session plan are compatible with the students' and the community's needs, capabilities, and aspirations. The course also aims to build up a cultural reservoir for the students that includes various texts representing different fields of knowledge and to train them on text analysis, understanding/ comprehension and summarizing as well as developing their literary skills and promoting their critical thinking in order to be able to write a coherent text taking into account linguistic correctness, accuracy and clarity and the ability to speak Arabic correctly in different situations and contexts.

COURSE WEEKLY CONTENTS

- 1 Overview and the importance of Arabic in various fields .
- 2 Arabic structures and taking into account correcting common mistakes/ errors.
- 3 The uses of simple and compound Arabic sentences.
- 4 Linguistic collocations, particularly in specific scientific fields.
- 5 Rules for writing a paragraph in Arabic.
- 6 Rules for report preparation and writing.
- 7 Rules for writing applications, resumes and the techniques used for each of them.
- 8 Principles of summarizing to ensure its correctness and validity.
- 9 Using Arabic for quick and brief presentations of certain raised issues.
- 10 Rules for writing official correspondences.
- 11 12th week assessment
- 12 Training on managing dialogues and discussions in Modern Standard Arabic (MSA) and promoting colloquial Arabic.
- 13 Correcting spelling mistakes that can lead to misunderstanding/ misconception.
- 14 Studying errors resulting from rendering foreign books without taking into account the Arabic structures.
- 15 Revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook

UNR1404 French Language**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
	1	1	2	0		2

COURSE AIM

The purpose of this course is to introduce students to learning practical and utilitarian French. At the end of this course, the student will be able to tackle a large part of the linguistic and even professional aspects through communication situations with precise and realistic objectives.

COURSE WEEKLY CONTENTS

- 1 Introduction to the course - Initial contact. Introduce yourself – making contact - start a conversation, (telephone) facing complications. Interaction-application. Present - personal pronouns complements – numbers.
- 2 Greet someone - write an e-mail - Greet a visitor to the company. Urge someone to wait. Apply the quality of a welcome. Interaction Application.
- 3 Agenda - Suggest - take - note - postpone - cancel an appointment. Organize your working time - Check information. Interaction- Application
- 4 Travel - Find out about the place of destination - get around - go sightseeing - ask - understand - explain an itinerary. Interaction
- 5 Expression of place - Imperfect - Imperative - Indirect speech.
- 6 Hotel - find out about a hotel - take - modify - report a reservation
- 7 Revision - Test of the 7th week.
- 8 Company - identify the company - explain, draw a graph - analyze compare results. Interaction - Application - Adverbs - numbers
- 9 Find a job - Consult, analyze a job offer, write an ad. Write a motivation letter, a C.V. Interaction - Application. Use of the subjunctive.
- 10 Job interview. Prepare, analyze, a job interview. Talk about yourself, your motivations. Interaction- Application. Expression of the goal.
- 11 Job interview.(Continuation), Know how to respond, convince the interlocutor.
- 12 Week 12 test.
- 13 Taking the floor. Practice active listening. Knowing how to compare, reformulate. Knowing how to respond, interrupt and reply with tact.
- 14 Make a presentation. Make a presentation, answer questions. Interaction. Application. Oral logical and discursive articulators.
- 15 Revision.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		3 0		M A R K S	→	30
8 to 12	←		2 0		M A R K S	→	20
1 to 15	←		1 0		M A R K S	→	10
16 or 17			Final Exam				40

REFERENCES

Textbook • Français.com. Intermédiaire. Auteur: Jean-luc Perforinis, CLE INTERNATIONAL

UNR1405 German Language**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	-	2

COURSE AIM

This course aims at enhancing learners' four language skills: listening, speaking, reading, and writing. In addition, it supports each skills-based lesson with speaking real-life activities designed to give students the opportunity to acquire and practice vocabulary and grammar.

COURSE WEEKLY CONTENTS

- 1 course orientation
- 2 Module 1 "I am Nicole"
- 3 workbook + module 1 "I am a journalist"
- 4 "I am a journalist" continued + workbook
- 5 Module 1 "This is my mother"
- 6 workbook + revision
- 7 Assessment of the 7th week
- 8 Module 2 "The table is beautiful"
- 9 Workbook + Module 2 "What is it? - This is an F. "
- 10 "What is it? - This is an F. " continued + workbook
- 11 Module 2 "I don't need an office"
- 12 workbook + revision + assessment of the 12th week
- 13 Module 3 "You are really great ...!"
- 14 workbook + exercises
- 15 revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Evans, S., Pude, A., & Specht, F. *Menschen A1*. Hueber Verlag GMBH & Co

UNR1406 Spanish Language**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	-	2

COURSE AIM

This course introduces the students to the Spanish language from scratch as they study the alphabets, grammar rules and vocabulary; it also enables them to understand the difference between gender and number, articles, ways of comparison, ways of conjugation in the present tense, imperative, direct and indirect objects. It also allows students to understand and practice the four skills of the language (reading, writing, speaking and listening) throughout conversations about activities of the normal day, holidays, feasts and Spanish culture. This course also aims at introducing the Spanish culture to the students through some debates, videos and songs. Also the aim of this course is to enable the students to communicate in Spanish.

COURSE WEEKLY CONTENTS

- 1 Introduction, overview of Spanish language and culture.
- 2 Alphabets, introduction to pronunciation and multiple activities on pronouncing words. Greetings, goodbyes and apologies. Application using mini conversations.
- 3 Introducing oneself. Introduction to the adjectives and nouns with the gender and number. Application using mini conversations.
- 4 Introduction to conjugation of verbs (regulars and irregulars). Describing people, introducing new adjectives of description and new vocabulary about body parts.
- 5 Introducing new vocabulary about the house and the class. Describing places (house, class) and describing objects. Application using mini conversations.
- 6 Introducing definite and indefinite articles, interrogatives, demonstrative adjectives and possessive adjectives. Application using mini conversations.
- 7 7th week assessment
- 8 Talking about normal day routine, saying and asking about the clock, reading and listening. Application using mini conversations.
- 9 Introduction to Comparison. Talking about famous feasts and parties in Spain.
- 10 Do's and don'ts comparing between Egypt and Spain. Application doing debates.
- 11 Introduction to the imperative, asking for favor and permission.
- 12 Introducing new vocabulary about the cloths with real situations in a cloths shop.
- 13 12th week assessment.
- 14 How to express pain, introduction new vocabulary about diseases. How to express exclamation, obligation and condition.
- 15 Introducing simple future. Introducing real situations in a restaurant. Description of countries, cities and villages. Speaking about weather conditions.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Martinez, A., Canales, A., Sacristan, A. y Cruz, N. Espanol Lengua Extranjera: Suena. Anaya: Universidad de Alcala. Madrid, Anaya ELE.

UNR2603 Environmental Sciences and Technology**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	0	2

COURSE AIM

- To raise the level of environmental awareness of the students, and provide them with the necessary knowledge, capabilities and attitude. This will enable them to deal more positively with environmental resources and their components, through learning about the diversity and complexity within the environment and the changes and transformations that occur through human activities.
- To raise the environmental awareness of the student regarding the importance of applying the sustainability aspects for computing projects as well as the preventive technology for environmental conservation.

COURSE WEEKLY CONTENTS

- 1 Environmental sciences and definitions of Physical, chemical, biological, and social environments and environmental studies
- 2 Ecology and ecological system, formations, functions and limiting factors, energy transfer and materials cycling in ecosystem
- 3 Changing the role of technology, sustainability and preventive technology
- 4 Green technology and sustainable communities
- 5 Population and population growth and resources depletion and pollution.
- 6 Air pollution sources, types and control, smoke, fogs and smog phenomena.
Greenhouse gases and impacts on the environment
- 7 Climate change and sea level rise and its management
- 8 Acid rains and its effects on soil, water and biological systems
- 9 2 hrs revision and 2 hrs the seventh week assessment -
- 10 Tropospheric and stratospheric ozone sources, roles and effects
- 11 Water pollution types, sources and treatments
- 12 Radiation and radioactivity and health hazards and radiation protection
- 13 Waste sources, types and management
- 14 Discussion of reports as and 12th week assessment
- 15 Environmental auditing, impacts assessment and methodology

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Cheryl Simon and Ruth Dyries, One Earth, One Future – Our Changing Global Environment, International Pub & Dis House.
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UNR2604 Safety and Risk Assessment**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	0	2

COURSE AIM

- Create awareness among the future employees (Students).
- An understanding of key practical risk assessment techniques.
- The ability to identify hazards and evaluate risk.
- Get to know how to implement monitoring and when and how to perform the review process.
- To be able to apply all these techniques in almost any environment or activity.
- By the end of the course students will be performing the risk assessments with confidence meaning they will leave with the ability to carry out the risk assessments at their workplace without assistance. By attending the risk assessment course, the students will be in a position to protect their staff and their business, as well as complying with the law.

COURSE WEEKLY CONTENTS

- 1 Introduction to Safety Risk Assessment.
- 2 The type of risk assessment in workplace.
- 3 Identifying and Defining Varying Levels and Types of Risk.
- 4 Hazardous Activities Can Include Issues (Specific Hazards).
- 5 Complexity of Work.
- 6 Age of Equipment and Preventative Maintenance Programs.
- 7 Specific Federal, State, and Local Regulations for Business Activities.
- 8 Determine Potential Risk in a Work Environment.
- 9 Risk Analysis.
- 10 Risk Matrix Template.
- 11 Risk Evaluation.
- 12 Risk Communication.
- 13 Risk Plan off The Ground.
- 14 Risk Management.
- 15 Documentation for Risk Assessment and Management.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Nicholas J. Bahr, System Safety Engineering and Risk Assessment: A Practical Approach, CRC Press.

UNR2504 Introduction to Photography**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	0	2

COURSE AIM

Photography is considered to be the most impressive communication medium. Therefore, it is playing the most vital role in our visual interactions throughout our lives, which reflects the importance of the course. This course aims to develop the student's abilities of visual expression and his senses of aesthetic appreciation through learning and practicing photography.

COURSE WEEKLY CONTENTS

- 1 Introduction and explanation of both aim and objectives of the course.
- 2 Technical aspects : camera types - camera parts
- 3 Technical aspects : lenses and accessories
- 4 Focal lengths , vision angles - aperture – shutter speed and iso
- 5 Photographic composition : introduction
- 6 Photographic composition : emphasis
- 7 7th week Assessment
- 8 Dealing with light : natural and artificial , shades and shadows
- 9 Dealing with light : flash
- 10 Balance – Contrast : colors
- 11 Contrast : texture
- 12 12th week Assessment
- 13 Dealing with movable objects
- 14 Special photographic effects
- 15 Photographic project

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17	Final Exam						40

REFERENCES

Textbook	Joinson , Simon . Landscapes and Cityscapes - 'The Digital Photographer' s Handbook . Roto Vision SA , East Sussex.
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UNR2505 Introduction to Cinematography**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	0	2

COURSE AIM

This course introduces students to the basic skills and techniques of filmmaking with special focus on cinematography. Basic camera operation, lenses, composition, camera angles, types of shots, and photo sequence are covered. The course also tackles visual storytelling, mise en scène, camera movement, storyboarding, script writing, and video editing. Students practice applying the different types of cuts and the basics of video editing software using Adobe Premiere Pro, color correction and color grading, in addition to text and animation.

COURSE WEEKLY CONTENTS

- 1 Basics of filmmaking - the history and technology
- 2 Basics of filmmaking techniques
- 3 Cinematic Language: visual language used in cinematic storytelling.
- 4 Rule of Third - compositional technique of dividing the frame into thirds to create visually appealing and balanced shots.
- 5 Storyboarding - Creating a visual plan for a film through the use of storyboards.
- 6 Lighting Systems - Different lighting setups and impact on the overall cinematic look and feel.
- 7 7th week exam.
- 8 Cinema shooting - Practical aspects of filming and capturing footage for a motion picture.
- 9 Lenses and Scenes - Camera lenses and effect on composition and perspective of film scenes.
- 10 Film Editing - Techniques and principles of film editing - selecting and assembling footage
- 11 Film Editing (cont.)
- 12 12th week exam.
- 13 Mise en scene - Arrangement and composition of elements within the frame, including the setting, props, and actors.
- 14 Mise en scene (cont.)
- 15 Realization - practical application and implementation of course concepts and techniques

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Ed Pincus, The filmmaker's Handbook, Plume

4.2.College Requirements

4.2.1.Basic and Applied Sciences (EBA)

4.2.1.1.Compulsory Courses

EBA0201 Precalculus (for science section students)

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	2	0	0

COURSE AIM

- Understand permutations, combinations, and binomial theorem.
- Understand real numbers and complex numbers.
- Identify differential calculus and its applications.
- Understand lines and planes, and orthogonal projections.
- Explain the relationship between the derivative and the definite integral as it is expressed in both parts of the Fundamental Theorem of Calculus.
- Use derivatives and integrals to model and solve applied problems.
- Sketch graphs based on calculus concepts.
- Generate statistics knowledge by understanding the vectors, the forces, the moments, and couples.
- Differentiate between types of velocity and motion with their applications.

COURSE WEEKLY CONTENTS

- 1 Functions and Limits
- 2 Left and right limits and continuity of the functions
- 3 Basic rules of differentiation
- 4 Chain rule and some applications
- 5 Curve sketching
- 6 Integration as an inverse operation of integration
- 7 Permutations and combinations
- 8 The binomial theorem
- 9 Determinations and Applications
- 10 Complex numbers
- 11 Vectors Pt I
- 12 Vectors Pt II
- 13 Forces
- 14 Motion of particles in straight lines
- 15 Kinetic and potential energy

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Marvin Bittinger, Judith Beecher, David Ellenbogen, and Judith Penna, Precalculus: Graphs and Models, Pearson
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EBA 1203 Calculus I**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None “for students of mathematics section”, OR EBA0201	1	1	2	2	0	3

COURSE AIM

- Differentiate certain types of functions (trigonometric functions and their inverse, exponential function, and logarithmic function).
- Understand and use the applications of differentiation (l'Hopital, Taylor and Maclaurin's expansions).

COURSE WEEKLY CONTENTS

1	Basic rules of differentiation.
2	Trigonometric function and their derivatives
3	Inverse of trigonometric and their derivatives
4	Logarithmic function and their derivatives
5	Exponential function and their derivatives
6	Derivatives of hyperbolic functions and their inverse
7	Parametric differentiation, Implicit differentiation
8	L'Hopital rule
9	Partial Differentiation
10	Taylor's and Maclaurin's expansions
11	Physical application
12	Curve sketching (Critical, maximum, minimum and inflection points)
13	Curve sketching (rational functions)
14	Conic sections
15	Review

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Sherman K.Stein, Anthony Barcellos, Calculus & Analytic Geometry, McGraw-Hill Higher Education.
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EBA 1204 Calculus II**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
EBA1203	1	2	2	2	--	3

COURSE AIM

1. Integrate different types of functions using various methods (Integrating by substitution, integration by parts).
2. Understand and use the applications of integration (Area & volume, average of a function, length of a curve).
3. Learn the basic theory of linear algebra
4. Solve system of linear equations using matrices, and determinants.

COURSE WEEKLY CONTENTS

- 1 Definition of indefinite integrals & table of famous integrals.
- 2 Simple rules of integration & the fundamental theorem of calculus.
- 3 Integration by parts.
- 4 Integration by parts & integration of rational functions.
- 5 Integration of rational functions.
- 6 Integration of Trigonometric powers.
- 7 Definite integration. Areas and Volumes.
- 8 Length of the curve.
- 9 Average of a function & numerical integration.
- 10 Matrix Algebra.
- 11 Solution of system of linear equations.
- 12 Eigenvalues and Eigenvectors.
- 13 Physical meaning of Eigenvalues and Eigenvectors & Cayley
- 14 Hamilton theorem.
- 15 Review

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Sherman K.Stein, Anthony Barcellos, Calculus & Analytic Geometry, McGraw-Hill Higher Education.

EBA 1110 Physics**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	0	2	3

COURSE AIM

- Understand the essential background of electricity, magnetism, and light.
- Make several experiments to make application on electricity, magnetism and light.
- Write technical reports and results.
- Understand the concepts of induction magnetic flux, and electric currents.
- Realize sound concepts and understand its properties

COURSE WEEKLY CONTENTS

- 1 Introduction to Vectors
- 2 Newton Law of Motion
- 3 Work & Energy
- 4 Introduction to Waves
- 5 Sound Waves-velocity of sound in solids, liquids and gasses
- 6 Superposition of waves- properties of sound wave
- 7 7th Exam
- 8 Capacitors
- 9 Electric Current and Resistance
- 10 Kirchhoff Law and RC circuit
- 11 Magnetic Force- Magnetic field
- 12 12th Exam
- 13 Source of Magnetic Field
- 14 Faraday Law
- 15 Inductance and General Revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Serway and Jewett, Physics for Engineers and Scientists, Thomson Brooks/Cole.

EBA 2203 Probability & Statistics**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
EBA 1204	2	3	2	2	0	3

COURSE AIM

- Use statistical methodology and tools in the problem-solving process.
- Compute and interpret descriptive statistics using numerical and graphical techniques.
- Understand the basic concepts of probability, random variables, probability distribution, and joint probability distribution.
- Compute point estimation of parameters, explain sampling distributions, and understand the central limit theorem.

COURSE WEEKLY CONTENTS

- 1 An introduction to statistics and statistical analysis on data observation.
- 2 Statistical measurements.
- 3 Elementary Probability- Probability theorems.
- 4 Conditional probability --Independent and dependent events.
- 5 Total probability rule – Bayes' Theorem and applications.
- 6 Discrete probability distribution – probability mass function.
- 7 Continuous probability distribution – probability density function. 7th week exam.
- 8 Mathematical expectation, mean and variance.
- 9 Special discrete distribution: Bernoulli , Binomial, Hypergeometric and Poisson distributions.
- 10 Special continuous distribution: Uniform and exponential distribution.
- 11 Special continuous distribution: normal distribution.
- 12 Normal distribution.
- 13 Discrete joint probability distribution.
- 14 Continuous joint probability distribution.
- 15 Final Revision.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Ronald E. Walpole and Raymond H. Myers, Probability & Statistics for Engineers & Scientists , Person.

EBA 2204 Linear Algebra**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
EBA 1204	2	3	2	2	0	3

COURSE AIM

- Learn important concepts of linear algebra.
- Be familiar with the ideas of matrices and their applications in solving problems involving systems of linear equations.

COURSE WEEKLY CONTENTS

- 1 Matrices: Definition - Addition –Scalar multiplication – Matrices with special properties.
- 2 Matrix multiplication – Matrix transpose – Determinants.
- 3 Matrix inverse.
- 4 Systems of linear equations: Linear equations - Reduced Row Echelon Form and Row Operations – Matrix Rank.
- 5 Rank and systems of linear equations - The Homogeneous Case.
- 6 Systems of linear equations the Non-Homogeneous Case – Criteria for Consistency and Uniqueness.
- 7 Criteria for Consistency and Uniqueness.
- 8 Vector Spaces: Vector Algebra [definition-addition-multiplication by scalar-dot product-cross product].
- 9 Definitions of vector space and Basic Concepts – Subspaces part 1.
- 10 Definitions of vector space and Basic Concepts – Subspaces part 2.
- 11 Definitions of vector space and Basic Concepts – Subspaces part 3.
- 12 Introduction to Linear Transformations.
- 13 Linear Transformations: Mappings - General Properties of Linear Transformations.
- 14 Eigenvalues and Eigen.
- 15 Diagonalization.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook David C. Lay, Steven R. Lay, Judi J. McDonald, Linear Algebra and Its Applications, Pearson.

4.2.1.2.Science Electives**EBA 1106 Advanced Physics****COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
EBA 1110	1	2	2	0	2	3

COURSE AIM

- Understand the essential background of wave motion.
- Make several experiments to absorb the nature of light.
- Write technical reports and results.
- Realize the concepts of relativity

COURSE WEEKLY CONTENTS

1	Heat, Temperature and Temperature scales
2	Zeroth law of thermodynamics- Thermal Equilibrium – Thermal expansion (linear coefficient, volume coefficient)
3	Specific heat capacity, Specific latent heat, Q-T diagram
4	First law of thermodynamics, thermodynamics processes, P-v diagram
5	Classification of waves, longitudinal, transverse, Electromagnetic spectrum, continuous spectrum (applications and properties)
6	Properties of light waves (reflection, refraction (Snell's law), diffraction, dispersion, interference (Young double slits expt.)
7	Young double slits, expt.
8	Early Atomic structure models, Hydrogen Atom, Hydrogen atomic spectra, properties of Hydrogen atom spectra
9	quantum view of light, Definition of quanta, photo-electric Effect, Plank's constant.
10	Work function, kinetic energy of transmitted electrons from the metal surface and their velocities.
11	Black Body Radiation, Infra-red types
12	Infra-red-types
13	Modern physics of X-ray, generation of X-ray, properties of X-ray, Applications of X-ray in real life (medical, industrial,.....)
14	Gamma-rays (generation and application,...) in comparison to X-rays
15	Laser, generation of laser beam, Types of Lasers, properties of Laser light, Applications of lasers. Plasma matter, generation and application in modern life
15	General Revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		3 0	MARKS		→	30
8 to 12	←		2 0	MARKS		→	20
1 to 15	←		1 0	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Serway and Jewett, Physics for Engineers and Scientists, Thomson Brooks/Cole.
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EBA 1107 Quantum Physics**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
EBA 1110	1	2	2	0	2	3

COURSE AIM

Provides students to understand the fundamental concepts within quantum mechanics to gain the necessary foundation for studying quantum computation. Topics to be covered include black body radiation and Planck's hypotheses- photo-electric effect. Compton effect- wave properties of particles. A new model: The quantum particle- double slit experiment revisited- uncertainty principle- the wave function and probability- Analysis model: Quantum particle under boundary conditions The Schrodinger equation- Tunneling through a potential energy barrier- Applications of tunneling - Quantum harmonic oscillation- Quantum computing.

COURSE WEEKLY CONTENTS

- 1 Black body radiation and Planck's hypotheses- photo-electric effect
- 2 Compton effect- wave properties of particles
- 3 A new model: The quantum particle- double slit experiment revisited- uncertainty principle
- 4 Quantum mechanics (the wave function and probability)- momentum- kinetic energy
- 5 One dimensional wave functions and expectation values
- 6 Analysis model: Quantum particle under boundary conditions
- 7 Quantum particle
- 8 A particle in a box
- 9 The Schrodinger equation- The particle in a box Revisited.
- 10 A particle in a well of finite height
- 11 Tunneling through a potential energy barrier
- 12 Potential energy
- 13 Applications of tunneling- Resonant tunneling devices- Resonant tunneling transistors.
- 14 Quantum harmonic oscillation- Quantum computing
- 15 Final revision.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Serway and Jewett, Physics for Engineers and Scientists, Thomson Brooks/Cole.

EBA 1300 Biochemistry**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	2	2	0	2	3

COURSE AIM

This course focuses on the study of living cells and biological molecules with an emphasis on their applications in chemical and pharmaceutical industries. Topics to be covered include cell biology and structure, fundamental biochemistry of proteins and enzymes, metabolic pathways and biosynthesis of metabolites, molecular biology including central dogma, genetic code, protein synthesis and practical examples of industrial applications.

COURSE WEEKLY CONTENTS

- 1 Course overview and introduction to biochemistry.
- 2 Basics of cell biology.
- 3 Cell membrane and cell organelles.
- 4 Cell transport (passive transport).
- 5 Cell transport continued (Active & bulk transport)
- 6 Fundamental biochemistry of proteins (importance of proteins, properties & classification of amino acids).
- 7 Fundamental biochemistry of proteins continued (peptide bonds, conformational levels of proteins, conjugated proteins, Denaturation).
- 8 Enzymes and co-enzymes (mechanism of enzyme catalysis, specificity, models of fitting, classification of enzymes, co-factors).
- 9 Holoenzymes, pro-enzymes, isoenzymes, enzyme kinetics (factors affecting activity).
- 10 Enzyme inhibitors and applications.
- 11 Nucleotides and structure of nucleic acids.
- 12 Central dogma of life and genetic code.
- 13 Gene expression and regulation, and protein synthesis.
- 14 Water soluble and fat soluble vitamins.
- 15 Metabolic pathways and biosynthesis of metabolites

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Denise R Ferrier., Ph. D. Lippincott's Illustrated Reviews: Biochemistry. Philadelphia :Wolters Kluwer.

4.2.2.Computer Science Courses (CCS)

CCS1101 Introduction to Computing

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	2	0	3

COURSE AIM

- Understand and state the importance, capabilities, and limitations of computers and computation.
- Identify and explain what computers are and how they work, including the computer hardware components and their types and specifications.
- Understand data representation and numbering systems.
- Understand system and application software with examples.
- Understand the use algorithms and flowcharts.
- Develop simple programs using a high- level programming language.

COURSE WEEKLY CONTENTS

1	Introduction
2	New Trends in Computing
3	New Trends in Computing cont.
4	Hardware and Computer Architecture
5	Computer Software
6	Algorithms Design and Problem Solving
7	Flowcharts and Algorithm Design part 1
8	Flowcharts and Algorithm Design part 2
9	Programming languages - Programming (Data types, variables, constants)
10	Programming (Arithmetic Expressions and Decisions)
11	Programming (Loops) part 1
12	Programming (Loops) part 2
13	Programming (Arrays)
14	Programming (Functions) part 1
15	Programming (Functions) part 2

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		3 0	MARKS		→	30
8 to 12	←		2 0	MARKS		→	20
1 to 15	←		1 0	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Behrouz A. Forouzan, Foundations of Computer Science, Cengage Learning
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CCS1302 Problem Solving and Programming**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS1101	1	2	2	2	2	3

COURSE AIM

- Understand different types of problems and problem-solving techniques.
- Understand the problem-solving life cycle.
- Use and understand pseudo-code and flowcharts.
- Understand structured programming, functions, data types, and operators.
- Understand and use different control structures.
- Design and implement different solutions.
- Be able to apply problem analysis and algorithmic thinking.

COURSE WEEKLY CONTENTS

1	Problem Solving and Algorithm Design part 1
2	Problem Solving and Algorithm Design part 2
3	2D Arrays
4	Functions (Pass by value)
5	Pointers
6	Functions (Pass by Reference)
7	Functions (Recursion)
8	Strings
9	Structs
10	Searching
11	Sorting
12	Files part 1
13	Files part 2
14	Problem Solving Case Studies
15	Course Review and Conclusion

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	P. Deitel, H. Deitel, C How to Program, Prentice Hall.
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CCS1001 Discrete Structures**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS1101	1	2	2	2	0	3

COURSE AIM

- Use logic to determine the validity of an argument.
- Construct the proof of a theorem.
- Use combinatorial techniques when needed in solving problems.
- Identify functions; specifically, surjective, injective, and bijective functions.
- Identify relations; specifically, a partial order, equivalence, and total order relations.
- Understand the terminology and concepts of elementary graph theory.

COURSE WEEKLY CONTENTS

- 1 Introduction and Logic form and logical equivalence
- 2 Conditional statements
- 3 Valid and invalid arguments
- 4 Predicates and quantified statements
- 5 Arguments with quantified statements
- 6 Methods of proof: Direct proof and counterexample part 1
- 7 Methods of proof: Direct proof and counterexample part 2
- 8 Methods of proof: Contraposition and contradiction
- 9 Sequences and mathematical induction
- 10 Counting part 1
- 11 Counting part 2
- 12 Functions
- 13 Composite Functions
- 14 Relations and elementary graph theory
- 15 Relations and elementary graph theory

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Susanna Epp, Discrete Mathematics with Applications, Thomson Learning.

CCS2401 Data Structures and Algorithms**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS2303	2	4	2	2	0	3

COURSE AIM

- Understand the difference between static and dynamic data types.
- Understand the concept of pointers & dynamic memory allocation.
- Acquire practical programming experience using dynamic structures.
- Analyze the organizations of proposed data structures and how to use them efficiently.
- Apply the acquired knowledge in many practical applications like database, network, compiler and others.
- Demonstrate the ability to design abstract data types using various data structures.

COURSE WEEKLY CONTENTS

- 1 Introduction to Data Structures and Algorithms
- 2 Algorithm Analysis and Big-O Notation
- 3 Linked Lists part 1
- 4 Linked Lists part 2 and Circular and Double Linked Lists
- 5 Stacks
- 6 Queues
- 7 Trees
- 8 Binary Search Trees
- 9 Graphs
- 10 Graph Algorithms
- 11 Hashing
- 12 Heaps
- 13 Introduction to Algorithm Design Techniques part 1
- 14 Introduction to Algorithm Design Techniques part 2
- 15 Revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Noel Kalicharan, Data Structures in C, Create Space Independent Publishing Platform.

CCS2102 Digital Logic Design**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS1101	2	3	2	2	2	3

COURSE AIM

- Know the basic differences between analog and digital systems.
- Use binary numbers and codes.
- Describe the operation of logic gates.
- Apply Boolean algebra and K-map to simplify functions
- Design combinational and sequential logic circuits.

COURSE WEEKLY CONTENTS

- 1 Introduction to Digital Concepts
- 2 Numbering systems, Operations and Codes
- 3 Logic Gates
- 4 Combination Logic Circuits
- 5 Truth Tables and Standard Forms
- 6 Boolean algebra and Logic simplification
- 7 Simplification using K-map
- 8 Basic Adders and Comparators
- 9 Decoders
- 10 Encoders
- 11 MUX
- 12 DMUX
- 13 Latches and Flip-Flops
- 14 Asynchronous Counters
- 15 Synchronous Counters

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Thomas L. Floyd, Digital Fundamentals, Prentice Hall.

CCS2201 Introduction to Networks**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS1302	2	3	2	2	0	3

COURSE AIM

- Differentiate between circuit switching and packet switching.
- Master principles of network applications (Web and HTTP, FTP, Email, and DNS).
- Master transport layer services (connection- oriented (TCP) and connectionless (UDP) services).
- Experiment with TCP congestion control.
- Know the innerworkings of the IP protocol (Forwarding and addressing in the Internet) and sample routing algorithms.
- Outline the design of Ethernet and multiple access protocols.
- Design and implement simple network applications.

COURSE WEEKLY CONTENTS

- 1 Introduction
- 2 Network Edge and Network Core
- 3 Delay, Loss, and Throughput. Protocol Layers. Network Under Attack
- 4 Principles of Network Applications. HTTP protocol
- 5 SMTP and DNS
- 6 Trans Layer Services. UDP
- 7 Principles of Reliable Data Transfer
- 8 TCP
- 9 Internet Protocol
- 10 Forwarding and SDN
- 11 Routing Algorithms part 1
- 12 Routing Algorithms part 2
- 13 Wireless and Mobile Networks part 1
- 14 Wireless and Mobile Networks part 2
- 15 Revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook James Kurose and Keith Ross, Computer Networking: A Top-Down Approach, Pearson.

CCS2103 Introduction to Computer Architecture**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS2102	2	4	2	2	0	3

COURSE AIM

- Present the various digital components used in the organization and design of digital computers.
- Explain the detailed steps that a designer must go through in order to design an elementary basic computer.
- Introduce the organization and architecture of the main units of a digital computer.
- Experiment with assembly language programming for a hypothetical machine.

COURSE WEEKLY CONTENTS

- 1 Introduction
- 2 CPU basics and Organization – ALU Design (adders and subtractors)
- 3 CPU basics and Organization – Registers Design
- 4 MARIE Architecture and Data Path
- 5 Instruction Processing
- 6 Extending Instruction Set
- 7 Machine Control
- 8 Instruction Formats
- 9 Instruction Types and Addressing
- 10 Instruction Pipelining
- 11 Types of Memory
- 12 Memory Hierarchy and Cache Memory
- 13 Input/Output Architectures
- 14 Performance Measurement and Analysis
- 15 Revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Null Linda and Julia Lobur, The Essentials of Computer Organization and Architecture, Jones and Bartlett Publishers.
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CCS2303 Object-Oriented Programming

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS1302	2	3	2	2	2	3

COURSE AIM

- Become familiar with breaking down a problem into objects rather than procedures.
- Learn object-oriented programming concepts.
- Develop programs using an object-oriented programming high level programming language.

COURSE WEEKLY CONTENTS

- 1 Introduction to OOP
- 2 Review of Programming Basics using the selected language part 1
- 3 Review of Programming Basics using the selected language part 2
- 4 API of the Selected Language
- 5 Class Members
- 6 Array-Pass by Value/Pass by Reference
- 7 Access Modifiers
- 8 Encapsulation
- 9 Object Oriented Relationships - Association
- 10 Object Oriented Relationships – Aggregation and composition
- 11 Object Oriented Relationships – Inheritance
- 12 Polymorphism part 1
- 13 Polymorphism part 2
- 14 Benefits of Polymorphism
- 15 Course Review and Conclusion

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Y Daniel Liang, Introduction to JAVA Programming, Comprehensive Version, Pearson.

CCS2304 Advanced Programming Applications**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS2303	2	4	2	2	0	3

COURSE AIM

- Implement advanced OOP programs using a high level programming language.
- Build advanced user interfaces.
- Understand multithreaded programming.
- Communicate with a DBMS.
- Discuss distributed computing.
- Build simple client-server applications using socket programming.
- Discuss RMI and CORBA.
- Be familiar with different design patterns.

COURSE WEEKLY CONTENTS

- 1 Review: Encapsulation/OO relationships and polymorphism
- 2 Basics of GUI development
- 3 Exceptions and file Processing
- 4 Event handling
- 5 Database Programming
- 6 Exception and File I/O
- 7 Build graphical user interfaces
- 8 Database Programming (Case Studies)
- 9 Generic Programming
- 10 Design Pattern: Introduction (factory, builder, Singleton, and prototype patterns)
- 11 MVC Architectural Pattern and Observer design pattern
- 12 Multithreading
- 13 Socket Programming
- 14 Remote Method Invocation (RMI)
- 15 Course Review and Conclusion

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Y Daniel Liang, Introduction to JAVA Programming, Comprehensive Version, Pearson.

CCS2305 Web Programming**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CIS2101	2	4	2	2	0	3

COURSE AIM

- Write HTML files without using web generation tools.
- Specify the difference between client-side and server-side web programming.
- Master the basic syntax of JavaScript as a client-side scripting language.
- Understand the principles of cascading style sheets to control the styling and layout of a webpage.
- Describe how server-side scripts work.
- Use PHP to develop data-driven web sites.
- Use AJAX and JQuery to build internet applications.

COURSE WEEKLY CONTENTS

- 1 Introduction to web programming
- 2 Introduction to HTML
- 3 HTML5 Tags
- 4 CSS
- 5 CSS: properties and selectors
- 6 Basic of Java Script part 1
- 7 Basic of Java Script part 2
- 8 Java Script Objects
- 9 Understand DOM and DHTML
- 10 Event-driven programming
- 11 Basics of PHP part 1
- 12 Basics of PHP part 2
- 13 Form handling and DB access in PHP
- 14 Introduction to Ajax
- 15 Course Review and Conclusion

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Randy Connolly Ricardo Hoar, Fundamentals of Web Development, Pearson.

CCS3203 Operating Systems**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS2103 & CCS2401	3	5	2	2	2	3

COURSE AIM

- Understand the processes and threads concepts.
- Apply process management techniques.
- Experiment with memory management techniques.
- Practice with sample resource management problems such as concurrency control and mutual exclusion.
- Master operating systems algorithms such as CPU scheduling and page replacement algorithms.
- Evaluate performance of various OS components

COURSE WEEKLY CONTENTS

- 1 Course Introduction and Computer System Overview part 1
- 2 Computer System Overview part 2
- 3 Operating System Overview
- 4 Process Description and Control part 1
- 5 Process Description and Control part 2
- 6 Threads
- 7 Concurrency: Mutual Exclusion and Synchronization part 1
- 8 Concurrency: Mutual Exclusion and Synchronization part 2
- 9 Concurrency: Deadlock and Starvation
- 10 Memory Management
- 11 Virtual Memory part 1
- 12 Virtual Memory part 2
- 13 Uniprocessor Scheduling
- 14 File Management
- 15 Disk Scheduling

COURSE INFORMATION**STUDENT GRADING & ASSESSMENT**

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook William Stallings, Operating Systems: Internals and Design Principles, Pearson.

4.2.3. Artificial Intelligence Courses (CAI)

CAI3101 Introduction to Artificial Intelligence

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS1001 & CCS2401	3	5	2	2	0	3

COURSE AIM

- Understand the basic concepts of artificial intelligence.
- Understand state space representation.
- Compare different problem-solving strategies based on algorithms and heuristics.
- Understand the basic concepts of game trees.
- Understand the basic concepts of machine learning using supervised and unsupervised methods.

COURSE WEEKLY CONTENTS

- 1 Introduction to AI: Definition, History and Goals.
- 2 Intelligent Agents and Problem Solving.
- 3 State Space Representation and Search Techniques (Blind search) .
- 4 Search Techniques (Heuristic Search, ...).
- 5 A* Algorithm, Admissibility, Monotonicity and Informedness of a heuristic function.
- 6 Game trees and Alpha Beta Pruning Algorithm.
- 7 Propositional Logic
- 8 First Order Logic
- 9 Introduction to Machine Learning - Supervised Learning.
- 10 Supervised Learning cont.
- 11 Perceptron Learning Algorithm.
- 12 Artificial Neural Networks.
- 13 Unsupervised Learning (K-means).
- 14 New trends in Artificial Intelligence.
- 15 Course Review and Conclusion.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		3 0	M A R K S		→	30
8 to 12	←		2 0	M A R K S		→	20
1 to 15	←		1 0	M A R K S		→	10
16 or 17	Final Exam						40

REFERENCES

Textbook RUSSELL, GEORGE, Artificial Intelligence: A Modern Approach, Pearson.

4.2.4.Information Systems Courses (CIS)

CIS1000 Introduction to Information Systems

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
None	1	1	2	2	0	3

COURSE AIM

1. Overview the five basic areas of information systems knowledge needed by business professionals, including the conceptual system components and major types of information systems
2. Introduce fundamental concepts of competitive advantage through information technology.
3. Review history, trends, and developments in microcomputer, midrange, and mainframe computer systems; basic computer system concepts; and the major types of technologies used in peripheral devices for computer input, output, and storage.
4. Review the basic features and trends in the major types of application software and system software used to support enterprise and end-user computing.
5. Introduce key database management concepts and applications in business information systems.
6. Present an overview of the Internet and other telecommunication networks, business applications, and trends and reviews technical telecommunications alternatives.
7. Understand the role of e-business, e-commerce and decision support systems.

COURSE WEEKLY CONTENTS

- 1 Course Description and Introduction
- 2 Foundations of Information Systems in Business
- 3 Organizational strategy, Competitive advantage and IS
- 4 Ethics and Privacy
- 5 Information Security
- 6 Multimedia Information Systems part 1
- 7 Multimedia Information Systems part 2
- 8 Data and Knowledge Management
- 9 E-business and E-commerce
- 10 Systems Analysis and Design
- 11 Social Computing part 1
- 12 Social Computing part 2
- 13 Information systems within the Organization
- 14 Business Analytics part 1
- 15 Business Analytics part 2

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		3 0	M A R K S		→	30
8 to 12	←		2 0	M A R K S		→	20
1 to 15	←		1 0	M A R K S		→	10
16 or 17	Final Exam						40

REFERENCES

Textbook	Ralph M. Stair, Thomas Chesney, George Walter Reynolds, Principles of Business Information Systems, Cengage Learning.
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CIS2101 Database Systems**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS1302	2	3	2	2	0	3

COURSE AIM

- Understand the fundamental concepts of database and database management systems, and historical roots of database
- Understand conceptual database design using Entity-Relationship modeling.
- Understand database design methodology using normalization.
- Design a database system for a real-world problem.
- Learn about SQL data modification and data definitions.
- Write SQL queries and sub queries.
- Implement and verify a database system.

COURSE WEEKLY CONTENTS

- 1 Course Description and Introduction
- 2 The Entity Relationship Model
- 3 Constraints in ERMs
- 4 The Relational Model
- 5 SQL and Relational Algebra
- 6 SQL DDL and DML
- 7 SQL Queries and Sub Queries
- 8 Functional Dependencies and Normalization part 1
- 9 Functional Dependencies and Normalization part 2
- 10 Semi-Structured Data and XML part 1
- 11 Semi-Structured Data and XML part 2
- 12 Transaction Management part 1
- 13 Transaction Management part 2
- 14 Projects Discussion
- 15 Revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Hector Garcia-Molina, Jeffrey Ullman, Jennifer Widom, Database Systems: The Complete Book, Prentice Hall.
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4.2.5. Software Engineering Courses (CSE)

CSE2001 Introduction to Software Engineering

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS2303 & CIS1000	2	4	2	2	0	3

COURSE AIM

- Understanding the software engineering process and different process models and how to choose between them.
- How to elicit requirements from a client and specify them.
- Design in the large, including principled choice of a software architecture.
- Develop a system design using UML notation. Understand good coding practices, including documentation, contracts, regression tests and daily builds.
- Understand quality assurance techniques, including unit testing, functional testing, and automated analysis tools.
- Understand the role of project management including planning, scheduling, risk management, etc.

COURSE WEEKLY CONTENTS

- 1 Introduction to Software Engineering
- 2 Software Process
- 3 Software Process Models part 1
- 4 Software Process Models part 2
- 5 Requirements Definition and Elicitation
- 6 Requirements Analysis and Specification
- 7 Structured Analysis and Design part 1
- 8 Structured Analysis and Design part 2
- 9 Object Oriented Analysis
- 10 Object Oriented Design
- 11 Design Concepts and Principles
- 12 Architectural Design
- 13 Software Quality Assurance
- 14 Verification and Validation
- 15 Projects

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		3 0		M A R K S	→	30
8 to 12	←		2 0		M A R K S	→	20
1 to 15	←		1 0		M A R K S	→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Ian Sommerville, Software Engineering, Pearson .

4.2.6.Cybersecurity Courses (CCY)

CCY2001 Introduction to Cybersecurity

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS2201	2	4	2	2	0	3

COURSE AIM

- Identify security vulnerabilities
- Identify cyberattacks types
- Understand countermeasures for cyberattacks
- Discuss cryptography basics
- Discuss network security basics
- Discuss E-commerce security basics
- Understand cybersecurity risk management basics
- Differentiate between cybersecurity standards

COURSE WEEKLY CONTENTS

- 1 Course Introduction
- 2 Cybersecurity Basics
- 3 Cyberattacks and Vulnerabilities
- 4 Recent Cyberattacks and their impact
- 5 Computer Malware and classification
- 6 Cryptography basics – Part I
- 7 Cryptography basics – Part II
- 8 Countermeasures for Cyberattacks – Part I
- 9 Countermeasures for Cyberattacks – Part II
- 10 Network Security basics
- 11 E- commerce Security basics
- 12 Cybersecurity Risk Management basics
- 13 Cybersecurity Standards
- 14 Cybersecurity for the Future
- 15 Revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Kutub Thakur and Al-Sakib Khan Pathan, Cybersecurity Fundamentals: A Real-World Perspective, CRC Press.
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4.2.7. Non-Computing Courses (CNC)

CNC1401 Entrepreneurship Skills

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
10 Cr.Hrs or more	1	2	2	0	0	2

COURSE AIM

- Emphasize an understanding of basic concepts in the area of entrepreneurship.
- Emphasize an understanding of the role and importance of entrepreneurship for economic development.
- Emphasize an understanding of the stages of the entrepreneurial process and the resources needed for the successful development of entrepreneurial ventures
- Adoption of the key steps in the elaboration of business idea.
- Develop personal creativity and entrepreneurial initiative

COURSE WEEKLY CONTENTS

- 1 The big picture
- 2 Ideation, passion and team formation
- 3 Business model canvas
- 4 Customers and market & prototyping
- 5 Customer engagement strategy
- 6 Basic of entrepreneurial finance
- 7 Business model: making it work
- 8 Get Data from internet
- 9 Creating communities
- 10 Who, Why (partners selection)
- 11 Operational plan and cost structure
- 12 Continuation of the previous lecture and evaluation.
- 13 Fine tuning / imagining new possibilities
- 14 The power of storytelling
- 15 Pitching of the business model

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.
1 to 7	←		30	MARKS		→
8 to 12	←		20	MARKS		→
1 to 15	←		10	MARKS		→
16 or 17	Final Exam (40 Marks)					

REFERENCES

Textbook

Donald Kuratko, Entrepreneurship: Theory, Process, Practice, Cengage

4.3.Program Requirements

4.3.1.Compulsory Courses

4.3.1.1.Computer Science Courses (CCS)

CCS3403 Computing Algorithms

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCS2401	3	6	2	2	--	3

COURSE AIM

- Apply asymptotic time complexity analysis to choose among competing algorithms.
- Construct and solve recurrence equations describing the asymptotic time complexity of a given algorithm.
- Identify the best algorithm design technique for a given problem.
- Implement efficient algorithms using the appropriate data structures.

COURSE WEEKLY CONTENTS

- 1 Introduction
- 2 Algorithms analysis and sorting techniques part 1
- 3 Algorithms analysis and sorting techniques part 2
- 4 Recurrences part 1
- 5 Recurrences part 2
- 6 Brute Force Algorithms part 1
- 7 Brute Force Algorithms part 2
- 8 Greedy Algorithms part 1
- 9 Greedy Algorithms part 2
- 10 Dynamic Programming part 1
- 11 Dynamic Programming part 2
- 12 Divide and Conquer
- 13 Graph Algorithms
- 14 Parallel Algorithms part 1
- 15 Parallel Algorithms part 2

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7			30				30
8 to 12			20				20
13 to 15			10				10
16 or 17			Final Exam				40

REFERENCES

Textbook Anany Levitin, An Introduction to the Design and Analysis of Algorithms, Pearson.

4.3.1.2.Cybersecurity Courses (CCY)

CCY3002 Introduction to Cryptography

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001 and EBA2204	3	5	2	2	--	3

COURSE AIM

To get the students to:

- Understand cryptography principles and algorithms.
- Understand the design principles of symmetric and asymmetric ciphers
- Experiment with symmetric and asymmetric ciphers implementation and operation
- Understand cryptographic hash functions and message authentication codes
- Understand digital signatures algorithms and implementation
- Understand and experiment with key distribution protocols for symmetric and asymmetric cryptography

COURSE WEEKLY CONTENTS

- 1 Course Introduction and Syllabus discussion
- 2 Introduction to Number Theory
- 3 Classical Encryption Techniques
- 4 Block ciphers and the Data Encryption Standard
- 5 Finite Fields and Advanced Encryption standard
- 6 Block cipher operation
- 7 Random bit generation and stream ciphers
- 8 7th week Assessment
- 9 Public-key cryptography and RSA
- 10 Other Public Key cryptosystems
- 11 Cryptographic Hash functions and Message Authentication Codes
- 12 12th week Assessment and Digital Signatures
- 13 Cryptographic Key Management and Distribution
- 14 Cryptographic Key Management and Distribution (cont.)
- 15 Introduction to Quantum and Post-Quantum Cryptography

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7			30				30
8 to 12			20				20
13 to 15			10				10
16 or 17			Final Exam				40

REFERENCES

Textbook	William Stallings, Cryptography and Network Security: Principles and Practice, Pearson Jonathan Katz and Y. Lindell, Introduction to Modern Cryptography, CRC Press
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CCY3101 Software Security**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001 and CSE2001	3	5	2	--	2	3

COURSE AIM

To get the students to:

- Understand software security concepts
- Understand software security problems and threats to security.
- Experiment with and measure software security through estimation and metrics
- Understand secure software architecture and software security assurance
- apply secure software development life cycle
- Experiment with and apply software security and testing
-

COURSE WEEKLY CONTENTS

- 1 Course Introduction and Syllabus discussion
- 2 Software Security Concepts
- 3 Software Security Problems
- 4 Threats to Security
- 5 Software Security Metrics
- 6 Software Security Estimation
- 7 7th week Assessment
- 8 Secure Software Architecture
- 9 Software Security Assurance
- 10 Secure Software Development Process
- 11 Software Security Testing
- 12 12th week Assessment
- 13 Implementing Security Testing: Case Study
- 14 Implementing Software Security: Case Study
- 15 Projects Presentations

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7				30			30
8 to 12				20			20
13 to 15				10			10
16 or 17				Final Exam			40

REFERENCES

Textbook Suhel Ahmad Khan et al., Software Security: Concepts and Practice, CRC Press

CCY3201 Networks Security**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY3002	3	6	2	--	2	3

COURSE AIM

To get the students to:

- Understand networks security basics and protocols.
- Experiment with transport-layer security protocols
- Experiment with Wireless networks security
- Understand Email security and tools
- Understand network endpoint security (firewalls and intrusion detection)
- Understand basics of Cloud and IoT security

COURSE WEEKLY CONTENTS

1. Course Introduction and Syllabus Discussion
2. User Authentication and Federated Identity Management
3. Transport Layer Security basics
4. Transport Layer Security – HTTPS
5. Transport Layer Security – HTTPS (cont.)
6. Transport Layer Security – SSH
7. 7th Week Assessment
8. Wireless Networks Security
9. Email Security
10. IP Security
11. Network Endpoint Security - Firewalls
12. 12th Week Assessment
13. Network Endpoint Security – Intrusion Detection and Malicious Software
14. Introduction to Cloud Security
15. Introduction to IoT Security

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7			30				30
8 to 12			20				20
13 to 15			10				10
16 or 17			Final Exam				40

REFERENCES

Textbook	William Stallings, Cryptography and Network Security: Principles and Practice, Pearson ,2023 Charlie Kaufman et al., Network Security: Private Communications in a Public World, Addison-Wesley Professional
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CCY3501 Cybersecurity Law and Ethics**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001	3	5	2	2	--	3

COURSE AIM

To get the students to:

- Understand the ethical considerations and legal aspects of cybersecurity and computer usage.
- Comprehend data protection issues, intellectual property rights, and the principles of cybernetics.
- Acquire knowledge of various ethics concepts, theories, and professional codes of conduct.
- Develop an understanding of national, regional, and international laws governing cybersecurity and cybercrime.
- Explore the impact of cybersecurity on social issues, security incidents, and cybercrime, fostering a responsible and ethical approach to computer-related activities.
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COURSE WEEKLY CONTENTS

- 1 Introduction to Cybersecurity Ethics and Law
- 2 Data Protection and Privacy
- 3 Intellectual Property Rights
- 4 Cybernetics Principles and Frameworks
- 5 Ethical Concepts and Theories
- 6 Professional Ethics and Codes of Conduct
- 7 7th Exam
- 8 Moral Responsibility in Cybersecurity
- 9 National, and Regional Cybersecurity Laws and Regulations
- 10 International Cybersecurity Law
- 11 12th Exam
- 12 Other Regulations Affecting Cybersecurity
- 13 Ethical Considerations in Security Incidents
- 14 Legal Aspects of Security Incidents
- 15 Cybercrime and the Law

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Grabowski, M., & Robinson, E.P. Cyber Law and Ethics: Regulation of the Connected World, Routledge

CCY3302 Distributed Systems Security**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001 and CCS3203	3	6	2	2	--	3

COURSE AIM

To get the students to:

- Understand characterization and models of distributed systems.
- Understand the design of security protocols in distributed systems
- Experiment with and apply security protocols in distributed systems
- Understand the design of secure group communication protocols
- Understand access control and multilevel security in distributed systems
- Apply secure distributed systems development
- Understand mobile computing security and experiment with a case study

COURSE WEEKLY CONTENTS

- 1 Course Introduction and Syllabus discussion
- 2 Characterization of Distributed Systems
- 3 Distributed Systems Models
- 4 Distributed Systems Models (cont.)
- 5 Security Engineering and Opponents in Distributed Systems
- 6 Security Protocols in Distributed Systems
- 7 Security Protocols in Distributed Systems (cont.)
- 8 7th week Assessment
- 9 Secure Group Communication
- 10 Access Control and Multilevel Security
- 11 Secure Distributed Systems Development
- 12 12th week Assessment
- 13 Secure Distributed Systems Development (cont.)
- 14 Mobile Computing Security
- 15 Projects Presentations

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7			30				30
8 to 12			20				20
13 to 15			10				10
16 or 17			Final Exam				40

REFERENCES

Textbook	Ross Anderson, Security Engineering: A Guide to Building Dependable Distributed Systems, Wiley Coulouris G., Jean Dollimore J., Kindberg T., and Blair G., Distributed Systems: Concepts and Design, Addison-Wesley
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CCY3003 Digital Forensics and Incident Response**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001	3	6	2	--	2	3

COURSE AIM

To get the students to:

- Develop a comprehensive understanding of the major forensic processes employed in the investigation of cybercrimes, including computer procedure analysis, digital evidence collection, analysis, recovery, and preservation.
- Acquire technical proficiency in critical areas, such as data imaging, hashing, file recovery techniques, file system fundamentals, and the identification of mismatched file types.
- Learn how to effectively report and present digital evidence using established methodologies.
- Explore the legal and technical dimensions of digital forensics and incident response, ensuring students are well-versed in both the practical and legal aspects of the field.

COURSE WEEKLY CONTENTS

1	Introduction to Digital Forensics and Incident Response
2	Computer System Fundamentals
3	Data Acquisition and Imaging
4	Data Hashing and Integrity Verification
5	File Recovery and Reconstruction
6	File System Analysis
7	Identification of Mismatched File Types
8	7th week Assessment
9	Evidence Handling and Preservation
10	Network Forensics
11	Memory Forensics
12	Incident Response Frameworks
13	12th week Assessment
14	Malware Analysis for Incident Response
15	Legal and Ethical Considerations

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Johansen, Gerard, Digital Forensics and Incident Response: Incident response tools and techniques for effective cyber threat response, Packet Publisher
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CCY3102 Malware Analysis and Reverse Engineering**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001 and CCS2103	3	6	2	--	2	3

COURSE AIM

To get the students to:

- Develop a good understanding of Malware Analysis
- Use various static and dynamic malware analysis tools
- Learn skills used to analyze and stop breaches to networks.
- Use a Malware Analysis-based approach in order to resolve real world problems.
- Explore the different techniques of reverse engineering principles.

COURSE WEEKLY CONTENTS

- 1 Course Aim, Course outline, malware identification and Malware types and behaviors.
- 2 Malware Components and Analysis, and Reverse Engineering and assembly
- 3 Malware Analysis and Classification including Different techniques of binary files, including static analysis and decomposition analysis
- 4 Automated techniques for dynamic and static analysis.
- 5 Ethical considerations, Senior Managers How to Write a Good Report,
- 6 Conducting a reverse engineering analysis.
- 7 7th week Assessment
- 8 Obfuscation schemes.
- 9 Analyzing hostile malware
- 10 How to build signatures to stop malware.
- 11 12th week Assessment
- 12 How to use artificial intelligence and machine learning in malware analysis
- 13 Reverse engineering tools which demonstrate anti-analysis techniques
- 14 Malware obfuscation, and packaging techniques
- 15 revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Abhijit Mohanta and Anoop Saldanha, Malware Analysis and Detection Engineering: A Comprehensive Approach to Detect and Analyze Modern Malware, Apress
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CCY4202 Ethical Hacking and Penetration Testing**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY3201	4	7	2	--	2	3

COURSE AIM

To get the students to:

- Understand and apply ethical theories to cybersecurity issues.
- Gain practical experience with penetration testing tools and techniques.
- Learn about common cyber attacks and corresponding defensive measures.
- Develop skills in secure coding to prevent vulnerabilities.
- Master methodologies for identifying, exploiting, and mitigating security flaws

COURSE WEEKLY CONTENTS

- 1 Introduction to Ethical Hacking and Penetration Testing
- 2 Overview of Cyber Attacks
- 3 Defensive Measures and Incident Response
- 4 Secure Coding Practices
- 5 Race Conditions and Format String Vulnerabilities
- 6 Vulnerability Discovery Techniques
- 7 7th week Assessment
- 8 Exploitation Techniques
- 9 Fuzzing Techniques
- 10 Penetration Testing Methodologies
- 11 Network Security Assessment
- 12 12th week Assessment
- 13 Operating System Security Assessment
- 14 Application Security Assessment
- 15 Project Presentations

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Rafay Baloch, Ethical Hacking and Penetration Testing Guide, Auerbach Publications

CCY4301 Cyber-Physical Systems Security**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY3201	4	7	2	--	2	3

COURSE AIM

To get the students to:

- Understand the fundamental concepts and security challenges of Cyber-Physical Systems (CPS).
- Analyze and assess vulnerabilities in various CPS domains, with a focus on industrial control systems and critical infrastructure.
- Develop skills in protocol analysis, behavioral modeling, and the design of Intrusion Detection Systems (IDS) for CPS.
- Apply theoretical knowledge to practical case studies and gain the ability to address security issues in real-world cyber-physical systems.

COURSE WEEKLY CONTENTS

- 1 Overview of embedded systems and security principles
- 2 Hardware vulnerabilities and protection techniques
- 3 Secure Embedded Software Development.
- 4 Introduction to Cyber-Physical Systems Security
- 5 Mathematics of Continuous and Digital Control Systems
- 6 Control System Security
- 7 7th Week Assessment
- 8 Protocol Analysis for CPS Security
- 9 Behavioral Modeling of Cyber-Physical Systems
- 10 Intrusion Detection Systems (IDS) Fundamentals
- 11 Industrial Control Systems (ICS) Security Overview
- 12 12th Week Assessment
- 13 Security Challenges in Critical Infrastructure Systems
- 14 Medical Devices Security
- 15 IoT and Wireless Security for CPS

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Glenn Fink et al., Security and Privacy in Cyber-Physical Systems: Foundations, Principles, and Applications, Wiley-IEEE Press
	Robert Clark and Simon Hakim, Cyber-Physical Security: Protecting Critical Infrastructure at the State and Local Level, Springer

CCY4303 AI in Cybersecurity**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001 and CAI3101	4	8	2	2	--	3

COURSE AIM

To get the students to:

- Learn how to make use of AI techniques to solve cybersecurity problems.
- Know the principles of AI and different neural network architectures
- Understand how to detect spam, phishing, malware threats, and network anomalies through AI
- Understand attacks and defenses for Generative Adversarial networks
- Understand how to use machine learning for fraud detection
- Experiment with detecting patterns and model behavior and identifying anomalous behavior

COURSE WEEKLY CONTENTS

- 1 Course Aim, Course outline, and the principles of artificial intelligence, concentrating on cybersecurity-related applications
- 2 Different cryptographic techniques and some major attacks
- 3 Neural network architectures such as ANN, CNN, and GAN
- 4 Detecting Spams with AI techniques
- 5 Detecting Phishing with AI techniques.
- 6 Detecting Phishing with AI techniques (cont.)
- 7 7th week Assessment
- 8 Malware Threats detection
- 9 Network Anomalies detection
- 10 Machine Learning for fraud detection
- 11 12th week Assessment
- 12 Evaluating AI algorithms
- 13 GANs: Attacks and Defences
- 14 GANs: Attacks and Defences (cont.)
- 15 Projects Presentations

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Alessandro Parisi, Hands-on Artificial Intelligence for Cybersecurity: Implement Smart AI Systems for Preventing Cyber Attacks and Detecting Threats and Network Anomalies, Packt Publishing

CCY4401 Cybersecurity Risk Management**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001	4	8	2	2	--	3

COURSE AIM

To get the students to:

- Get an inside look at how cybersecurity and information technology (IT) managers determine which projects they will support with funding, and which they won't, based on a preliminary risk analysis.
- Learn techniques to be explicitly applied to cybersecurity
- Learn how to assess and articulate risk options and how to treat them.
- Learn the set of tools and techniques to build and maintain a risk management framework

COURSE WEEKLY CONTENTS

- 1 Course Aim and Course outline. What is cybersecurity and why learn cybersecurity
- 2 What Are Controls and Why Are They Important?
- 3 What is cyber risk?
- 4 Risk management principles and frameworks.
- 5 Quantitative versus Qualitative Risk Assessment
- 6 Identify, assess, and articulate risks and options available for treating risk
- 7 7th week Assessment.
- 8 Defining Information Security Metrics.
- 9 Analysis Techniques
- 10 Automating Metrics Calculations and Tools
- 11 Samples and techniques to implement risk management framework
- 12 12th week Assessment
- 13 Tools needed to successfully maintain a risk management framework
- 14 Industry case studies
- 15 Inspection reports, Feasibility reports, Research/laboratory reports, Foundational risk management techniques and Third-party security measures

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Cynthia Brumfield and Brian Haugli, Cybersecurity Risk Management, Wiley
Gerardus Blokdyk, Cybersecurity Risk Management A Complete Guide, 5STARCook

CCY4901 Project I**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
GPA>=2.0 & 90 CR or more	4	7	2	2	0	3

COURSE AIM

- Explain and identify the applications of the projects and its association with real and industrial life
- Demonstrate the ability of student to survey the main background and sketch comparative literature among different related models, tools and techniques
- Apply the phases of requirements, analysis and design in the software development life cycle and illustrating considerations of professional and ethical responsibilities.
- Demonstrate effective technical writing, communication and presentation skills.
- Demonstrate the ability to work effectively as a member of a development team and under guidance, manage his/her own learning and development including task breakdown, time management ,planning and organizational skills

COURSE WEEKLY CONTENTS

- 1 Formulate Problem definition(Problem Statement)
- 2 Determine Motivation and Applications
- 3 Articulate Project Aims and Objectives
- 4 Conduct Literature Survey part 1
- 5 Conduct Literature Survey part 2
- 6 Plan for the project (Scope definition and task breakdown, time management) Part 1
- 7 Plan for the project (Scope definition and task breakdown, time management) Part 2
- 8 Gather Requirements Part 1
- 9 Gather Requirements Part 2
- 10 Write the requirements specification document Part 1
- 11 Write the requirements specification document Part 2
- 12 Systems analysis of processes and data Part 1
- 13 Systems analysis of processes and data Part 2
- 14 Design the required features and operations in detail and produce design artifacts
- 15 Develop a Prototype

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.
1 to 7	←		3 0	M A R K S		→
8 to 12	←		2 0	M A R K S		→
1 to 15	←		1 0	M A R K S		→
16 or 17	Final Exam (40 Marks)					

CCY4902 Project II**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY4901	4	8	2	2	0	3

COURSE AIM

- Develop and test a substantial piece of software.
- Work effectively in collaborative teams and demonstrate individual responsibility and accountability, management and organization.
- Demonstrate the ability to explain and reflect upon the purpose, operation, success and value of the developed project in writing and orally.
- Write a report explaining methodology, outlining their contributions and the contributions of others, and documenting the developed project from appropriate perspectives, for instance that of a user, researcher or developer.

COURSE WEEKLY CONTENTS

1	Revise Analysis and design based on feedback from Project 1 defense part 1
2	Revise Analysis and design based on feedback from Project 1 defense part 2
3	Revise prototype done from Project 1 part 1
4	Revise prototype done from Project 1 part 2
5	Produce detailed technical specifications part 1
6	Produce detailed technical specifications part 2
7	Develop the software project part 1
8	Develop the software project part 2
9	Write test cases for the project part 1
10	Write test cases for the project part 2
11	Test the product in controlled and real situations part 1
12	Test the product in controlled and real situations part 2
13	Refine and improve the performance of produced software part 1 and Documentation
14	Refine and improve the performance of produced software part 2 and Documentation
15	Refine and improve the performance of produced software part 3 and Documentation

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

4.3.2. Elective Courses

CCY4004 Advanced Digital Forensics

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY3003	4	7/8	2	--	2	3

COURSE AIM

To get the students to:

- Explore the science and legal aspects of digital forensics, emphasizing evidence verification and admissibility in court.
- Examine various digital forensic models for data identification, retention, collection, testing, analysis, preparation, and presentation.
- Develop an advanced understanding of digital forensics for extracting digital evidence from a wide range of devices, including computers, networks, mobile phones, and more.
- Explore and evaluate various models of digital forensics, with a particular focus on data identification, retention, collection, testing, analysis, preparation, and presentation, ensuring students are well-equipped to handle complex investigative scenarios.
- Apply advanced research methods in digital forensics to uncover and document digital evidence, aligning their practices with the highest standards of accuracy and ethical responsibility.

COURSE WEEKLY CONTENTS

- 1 Introduction to Advanced Digital Forensics
- 2 Digital Forensics Models and Methodologies
- 3 Legal Aspects of Digital Forensics
- 4 Evidence Handling and Chain of Custody
- 5 Data Identification and Retention
- 6 Digital Device Imaging and Acquisition
- 7 7th week Assessment
- 8 Data Testing and Analysis Techniques
- 9 Forensic Data Preparation for Court
- 10 Digital Evidence Presentation and Court Procedures
- 11 Forensic Tools and Software
- 12 12th week Assessment
- 13 Network Forensics
- 14 Mobile Device Forensics
- 15 Future of Digital Forensics

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Johansen, Gerard, Digital Forensics and Incident Response: Incident response tools and techniques for effective cyber threat response, Packet Publisher
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CCY4005 Advanced Cryptography**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY3002	4	7/8	2	2	--	3

COURSE AIM

To get the students to:

- Develop an advanced understanding of cryptography, covering topics such as interactive proofs, secure protocols, and zero-knowledge proofs.
- Gain expertise in advanced cryptographic techniques, including non-interactive zero-knowledge proofs, two-party secure computation, homomorphic encryption, multiparty secure computation, key ratcheting, and quantum cryptography.
- Explore additional cryptography-related subjects, including fingerprinting, steganography, and digital watermarking.
- Be equipped with the knowledge and skills necessary to address complex cryptographic challenges and develop secure communication and data protection solutions.
- Prepare for advanced research or practical applications in the field of cryptography.
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COURSE WEEKLY CONTENTS

- 1 Introduction to Advanced Cryptography
- 2 Interactive Proofs and Their Applications
- 3 Secure Protocols in Cryptography
- 4 Zero-Knowledge Proofs
- 5 Non-Interactive Zero-Knowledge Proofs
- 6 Two-Party Secure Computation
- 7 7th week Assessment
- 8 Homomorphic Encryption
- 9 Multiparty Secure Computation
- 10 Key Ratcheting and Its Importance
- 11 12th week Assessment
- 12 Quantum Cryptography Principles
- 13 Fingerprinting in Cryptography
- 14 Steganography: Hiding Data within Data
- 15 Digital Watermarking for Data Protection

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17	Final Exam						40

REFERENCES

Textbook William Stallings, Cryptography and Network Security: Principles and Practice, Pearson
 Dan Boneh and Victor Shoup, A Graduate Course in Applied Cryptography, <https://toc.cryptobook.us/>

CCY4006 Multimedia Security**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY3002	4	7/8	2	--	2	3

COURSE AIM

To get the students to:

- Identify multimedia security issues
- Understand and experiment with multimedia cryptography techniques
- Understand and experiment with watermarking techniques
- Understand and experiment with multimedia authentication techniques
- Understand and experiment with multimedia forensics techniques
- Understand and experiment with authentication techniques via biometrics
- Understand and experiment with multimedia surveillance applications

COURSE WEEKLY CONTENTS

- 1 Course Introduction and Syllabus discussion
- 2 Multimedia Security Fundamentals
- 3 Multimedia Compression Technologies and Standards
- 4 Multimedia Cryptography
- 5 Multimedia Cryptography (cont.)
- 6 Steganography
- 7 7th week Assessment
- 8 Watermarking
- 9 Multimedia Authentication
- 10 Multimedia Authentication (cont.)
- 11 Multimedia Forensics
- 12 12th week Assessment
- 13 Authentication via Biometrics
- 14 Authentication via Biometrics (cont.)
- 15 Digital Surveillance and applications

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7			30				30
8 to 12			20				20
13 to 15			10				10
16 or 17			Final Exam				40

REFERENCES

Textbook	WeiQi Yan and Jonathan Weir, Fundamentals of Media Security, Ventus Publishing ApS Ze-Nian Li, Mark Drew, and Jiangchuan Liu, Fundamentals of Multimedia, Springer
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CCY4103 Blockchain and Applications**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY3002	4	7/8	2	--	2	3

COURSE AIM

To get the students to:

- Get a deep understanding of how Blockchain as a technology work
- Build a solid foundation on Blockchain to chart out further technology or consulting plans
- Understand when and how to use Blockchain
- Know the impact of Blockchain across different industries
- Understand how Blockchain has transformed how businesses and industries function
- Exposes students to a decentralized monetary system's consensus-based societal and legal implications

- 1 Course Aim, Course outline, the origin of Blockchain technologies
- 2 Public, private key fundamentals and the UTXO model.
- 3 Hashes and Block hashes
- 4 Different types of consensus
- 5 Second generation applications of a Blockchain technology (smart contract, tokens,...)
- 6 The Bitcoin forks
- 7 7th-week Assessment
- 8 The evolution to Ethereum.
- 9 Deployment and executing a smart contract in Ethereum.
- 10 Tokens on the Ethereum Platform.
- 11 Fundamentals Cryptocurrency analysis.
- 12 Decentralized finance and the web
- 13 12th-week Assessment
- 14 How to build decentralized applications and understand the different cryptographic techniques
- 15 A case study in Ethereum and hyperledger

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17	Final Exam						40

REFERENCES

Textbook Lorne Lantz, Daniel Cawrey, Mastering Blockchain: Unlocking the Power of Cryptocurrencies, Smart Contracts, and Decentralized Applications, O'Reilly Media

CCY4104 Web Security**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001 & CCS2305	4	7/8	2	--	2	3

COURSE AIM

To get the students to:

- Understand The fundamentals of web and browser security
- Know the guidelines for building secure web applications.
- Understand the security aspects of the web technologies
- Explore web vulnerabilities, web browser design flaws, and some advanced web privacy topics.

COURSE WEEKLY CONTENTS

- 1 Course Aim, Course outline, and introduction to web security
- 2 How the Internet works
- 3 How browsers work, HTTPS and its limitations
- 4 What are the latest emerging attacks facing the Internet?
- 5 Static and dynamic resources and tools critical in solving common web vulnerabilities.
- 6 7th week Assessment
- 7 Same origin policy and web attacker model. Injection flaws and Cross-site scripting
- 8 Injection Flaws (II): XSS (contd.), SQL Injection, OS Command Injection, HTTP Header Injection
- 9 Authentication flaws and request authentication flaws
- 10 Insecure Web Logic: Logic Flaws, HTTP Pollution, HTTP Parameter Tampering
- 11 Cookie Flaws and Server Misconfiguration
- 12 12th week Assessment
- 13 Attacks on User Interfaces
- 14 New web security defence techniques.
- 15 Projects Presentations

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Malcolm McDonald, Web Security for Developers, No Starch Press
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CCY4105 E-business Security**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001 & CIS1000	4	7/8	2	2	--	3

COURSE AIM

To get the students to:

- Understand related technologies in order to develop a secure e-commerce system
- Know the basic requirements for secure e-commerce systems
- Review areas of potential compromises in the security of client/server systems
- Analyze the vulnerabilities of a given system and make recommendations for making the system more secure.
- Develop an understanding of the client/server architecture and the various components used in distributed systems

COURSE WEEKLY CONTENTS

- 1 Course Aim, Course outline with an overview of e-Business and related security principles and concepts
- 2 Identification of common cyber threats targeting e-Businesses
- 3 Understanding basic web security models and protocols
- 4 Electronic Payment Systems and Payment Security Services
- 5 Electronic Payment Systems and Payment Security Services (cont.)
- 6 Principles of database security and data protection
- 7 7th week Assessment
- 8 Securing e-Business network architecture and protocols
- 9 Best practices for securing e-Business applications and platforms
- 10 Security challenges and solutions for mobile e-Business platforms
- 11 Securing cloud-based e-Business solutions and services
- 12 12th week Assessment
- 13 Regulatory compliance requirements and legal considerations
- 14 Strategies for detecting, responding to, and recovering from security incidents
- 15 Projects Presentations

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30		MARKS	→	30
8 to 12	←		20		MARKS	→	20
1 to 15	←		10		MARKS	→	10
16 or 17			Final Exam				40

REFERENCES

Textbook João Manuel R.S. Tavares et al. (Editors), Handbook of E-business Security, CRC press
Bryan Sullivan and Vincent Liu, Web Application Security, A Beginner's Guide, McGraw-Hill

CCY4203 Internet of Things Security**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY3201	4	7/8	2	--	2	3

COURSE AIM

To get the students to:

- Understand fundamentals of Internet of Things (IoT), its use cases and the implications of security and privacy attacks.
- Learn about attacks against IoT implementations and deployments at the various layers of IoT architecture.
- Gain a deeper understanding of how to systematically identify security threats in IoT and discuss system security lifecycle
- Deploy a simulation tool to develop security and privacy threats mitigation techniques

COURSE WEEKLY CONTENTS

- 1 Course outline, understanding IoT and implications of IoT security attacks
- 2 IoT Architecture and Core Modules - IoT Application Areas and Use Cases
- 3 IoT design, standards and Protocols
- 4 Security threats and vulnerabilities of IoT
- 5 Security Requirements in IoT Architecture
- 6 Security Engineering for IoT
- 7 IoT System Security Lifecycle
- 8 7th week Assessment
- 9 Cryptographic fundamentals for IoT Security Engineering
- 10 Cryptographic fundamentals for IoT Security Engineering (cont.)
- 11 Identity and Access Management Solutions for IoT
- 12 12th week Assessment
- 13 Identity and Access Management Solutions for IoT (cont.)
- 14 Trust and Privacy in IoT
- 15 Mitigating IoT privacy concerns

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7			30				30
8 to 12			20				20
13 to 15			10				10
16 or 17			Final Exam				40

REFERENCES

Textbook	Russell, Brian, and Drew Van Duren, "Practical Internet of Things Security: A practical, indispensable security guide that will navigate you through the complex realm of securely building and deploying systems in our IoT-connected world". Packt Publishing Ltd.
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CCY4205 Wireless Networks Security**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY3201	4	7/8	2	--	2	3

COURSE AIM

To get the students to:

- Understand the design of wireless LAN security protocols.
- Understand the design of Bluetooth, Zigbee, and RFID security protocols
- Understand the design of security protocols in vehicular communications
- Understand the design of security protocols in wireless sensor networks
- Experiment with and implement security protocols for wireless networks
- Experiment with penetration testing for wireless networks

COURSE WEEKLY CONTENTS

- 1 Course Introduction and Syllabus discussion
- 2 Mathematical Background Review
- 3 Wireless LAN Security Protocols
- 4 Wireless LAN Security Protocols (cont.)
- 5 Bluetooth Security Protocols
- 6 Zigbee Security Protocols
- 7 7th week Assessment
- 8 RFID Security Protocols
- 9 Penetration testing in Wireless Networks
- 10 Penetration testing in Wireless Networks (cont.)
- 11 Wireless Sensor Networks Security
- 12 12th week Assessment
- 13 Wireless Sensor Networks Security (cont.)
- 14 Security in Vehicular Communications
- 15 Security in Vehicular Communications (cont.)

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7			30				30
8 to 12			20				20
13 to 15			10				10
16 or 17			Final Exam				40

REFERENCES

Textbook	Yi Qian, Feng Ye, and Hsiao-Hwa Chen, Security in Wireless Communication Networks, Wiley-IEEE Press
	Parag Verma et al., Security Issues in Wireless Sensor Networks, CRC Press

CCY4204 Advanced Penetration Testing**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY4202	4	7/8	2	--	2	3

COURSE AIM

To get the students to:

- Demonstrate a deep understanding of advanced web application attacks and their mitigation strategies.
- Execute hand-crafted multi-stage and non-tool-based attacks to assess and enhance network security.
- Identify, simulate, and defend against layer two attacks and social engineering tactics.
- Develop expertise in exploit generation and delivery, physical attacks, insider threats, and ethical considerations, enabling them to provide valuable red teaming services to organizations.

COURSE WEEKLY CONTENTS

- 1 Introduction to Advanced Penetration Testing
- 2 Advanced Web Application Attacks
- 3 Multi-Stage and Non-Tool-Based Attacks
- 4 Layer Two Attacks and Mitigation
- 5 Social Engineering Techniques
- 6 Techniques for Stealth and Evasion
- 7 7th week Assessment
- 8 Exploit Generation and Delivery
- 9 Physical Attacks and Security
- 10 Insider Threats and Mitigation
- 11 Rules of Engagement and Legal Considerations
- 12 Reporting and Documentation
- 13 12th week Assessment
- 14 Professional Ethics in Penetration Testing
- 15 Red Teaming and Simulation

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Wil Allsopp, Advanced Penetration Testing, Wiley

CCY4304 Operating Systems Security**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001 and CCS3203	4	7/8	2	--	2	3

COURSE AIM

To get the students to:

- Identify security issues in operating systems
- Understand and experiment with access control models
- Apply buffer overflow defences
- Understand and experiment with OS kernel security mechanisms
- Understand virtualization security alternatives
- Understand and experiment with mobile OS security

COURSE WEEKLY CONTENTS

- 1 Course Introduction and Syllabus discussion
- 2 Security Issues in Operating Systems
- 3 Buffer Overflow Attacks and Defences
- 4 Access Control Fundamentals
- 5 Access Control: Verifiable Security Goals
- 6 OS Access Control Case studies
- 7 7th week Assessment
- 8 OS Kernel Security Mechanisms
- 9 OS Kernel Security Mechanisms (cont.)
- 10 Virtualization Security
- 11 Virtualization Security (cont.)
- 12 12th week Assessment
- 13 Mobile OS Security
- 14 Mobile OS Security (cont.)
- 15 Operating Systems Security Case Studies and Projects Presentations

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7			30				30
8 to 12			20				20
13 to 15			10				10
16 or 17			Final Exam				40

REFERENCES

- Textbook** Trent Jaeger, Operating System Security (Synthesis Lectures on Information Security, Privacy, and Trust), Springer
 William Stallings, Operating Systems: Internals and Design Principles, Pearson.

CCY4305 Advanced Malware Analysis and Reverse Engineering**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY3102	4	7/8	2	--	2	3

COURSE AIM

To get the students to:

- Understand different attack methods used by malicious actors and how they map to attack frameworks
- Learn how malware authors dynamically construct import tables for function calls
- Gain a deeper understanding of binary file formats and how to analyze them to learn more about malware behavior (Portable Executable- PE file format)
- Leverage static and dynamic tools to develop a hybrid approach for effectively analyzing malware including assembly level debuggers, disassemblers, decompilers and sandboxes.
- Learn how to interact in crucial dialogue around critical software program protection and forensics.

COURSE WEEKLY CONTENTS

- 1 Course Aim, Course outline, understanding what is reverse engineering Malware and Malware Analysis
- 2 Static Analysis
- 3 Dynamic Analysis
- 4 Assembly Language and Disassembly Primer
- 5 Disassembly Using IDA
- 6 Debugging Malicious Binaries.
- 7 Malware Functionalities and Persistence.
- 8 7th week Assessment
- 9 Reversing malware that uses Autolt ransomware,
- 10 Code Injection and Hooking
- 11 Malware Obfuscation Techniques
- 12 12th week Assessment
- 13 Hunting Malware Using Memory Forensics
- 14 Detecting Advanced Malware Using Memory Forensics
- 15 Exploring posted studies papers related to malware behavior analysis.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Monnappa K A, Learning Malware Analysis: Explore the Concepts, Tools, and Techniques to Analyze and Investigate Windows Malware, Packet Publisher
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CCY4307 Cloud Computing Security**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001 & CCS3203	4	7/8	2	--	2	3

COURSE AIM

To get the students to:

- To provide students with a comprehensive understanding of cloud computing security, covering essential concepts and principles.
- To equip students with the knowledge and skills to design secure cloud architectures and implement security measures in compliance with industry standards and regulatory requirements.
- To enable students to identify and mitigate security risks in cloud environments, including isolation and protection of physical and logical infrastructures.
- To familiarize students with security guidelines and best practices from prominent organizations such as ISO, NIST, ENISA, and CSA in the context of cloud computing
-

COURSE WEEKLY CONTENTS

- 1 Introduction to Cloud Computing Security
- 2 Cloud Landscape and Architecture Principles
- 3 Cloud Design Patterns for Security
- 4 Case Studies in Cloud Security and Security Approaches
- 5 Security Approaches for Cloud Architecture
- 6 Design Patterns for Cloud Security
- 7 7th Week Assessment
- 8 Industry Standards and Regulatory Compliance Requirements for Cloud Security
- 9 Risk Identification and Mitigation in the Cloud
- 10 Isolation and Protection in Cloud Environments
- 11 Data Protection for OSI Layers in Cloud
- 12 12th Week Assessment
- 13 End-to-End Identity and Access Control
- 14 Cloud Security Monitoring and Auditing
- 15 Security Guidelines from ISO, NIST, ENISA, and CSA for Cloud Computing

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook John R. Vacca, Cloud Computing Security, CRC Press

CCY4402 Cyber Security Policy and Governance**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001	4	7/8	2	2	--	3

COURSE AIM

To get the students to:

- Provides knowledge on the history of cyber security policy, the governance frameworks for policy making, the selection and application of policy, and the audit and control procedures to assure compliance and effectiveness.
- Students will be exposed to the national and international policy and legal considerations related to cybersecurity and cyberspace such as privacy, intellectual property, cybercrime, homeland security (i.e., critical infrastructure protection) and cyberwarfare, and the organizations involved in the formulation of such policies.
- Analyze policies thoroughly, identify their weaknesses, then compare and contrast them.
- Recognize the significance of training and compliance in information security risk management.
- To highlight the transdisciplinary impacts and issues that must be addressed in designing or putting it into practice successful national cybersecurity laws and policies, broader technology issues are also explored.

COURSE WEEKLY CONTENTS

- 1 Course Aim, Course outline, and governance overview
- 2 Security Governance and Regulation
- 3 Cybersecurity and the GDPR.
- 4 Risk management and information security outcomes
- 5 The SABSA framework and methodology
- 6 7th week Assessment
- 7 Know about COBIT management framework
- 8 Know ISO/IEC 27001/ 27002
- 9 What is risk management?
- 10 Developing a security strategy
- 11 12th week Assessment
- 12 What is bitcoin and its usage, and why they are volatile
- 13 Using CMM for strategy development
- 14 Incident management and response metrics.
- 15 A case study including a sample strategy development.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook	Krag Brotby, Information Security Governance: A Practical Development and Implementation Approach, Wiley Trim, Peter and Yang-Im Lee, Cyber Security Management: A Governance, Risk and Compliance Framework, Routledge
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CCY4403 Cyber Threat Intelligence**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY3002	4	7/8	2	2	--	3

COURSE AIM

To get the students to:

- Equip students with a deep understanding of cyber threat intelligence, focusing on the latest techniques and technologies in the field.
- Enable students to identify and utilize various sources of threat intelligence, including the creation of innovative cyber-threat intelligence platforms.
- Teach students how to apply analytics techniques to both traditional intelligence data feeds and hacker community datasets, such as Hacker Forums, IRC channels, and DarkNet marketplaces.
- Empower students to identify and collect intelligence feeds from diverse sources, including the Common Intelligence Model (CIF's), Trusted Automated eXchange of Intelligence Information (TAXII), and Security Information and Event Management (SIEM).
- Prepare students to contribute effectively to the field of cyber threat intelligence, addressing the evolving landscape of digital threats.

COURSE WEEKLY CONTENTS

- 1 Introduction to Cyber Threat Intelligence
- 2 Sources of Threat Intelligence
- 3 Creating a Cyber-Threat Intelligence Platform
- 4 Analytics Techniques for Traditional Intelligence Data Feeds
- 5 Analyzing Hacker Community Datasets
- 6 Identifying and Collecting Intelligence Feeds
- 7 7th Week Assessment
- 8 The Common Intelligence Model (CIF's)
- 9 Trusted Automated eXchange of Intelligence Information (TAXII)
- 10 Security Information and Event Management (SIEM)
- 11 Threat Indicators and Data Enrichment
- 12 12th Week Assessment
- 13 Threat Intelligence Sharing and Collaboration
- 14 Threat Intelligence in Incident Response
- 15 Emerging Trends in Cyber Threat Intelligence

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17			Final Exam				40

REFERENCES

Textbook Bob Stasio, Cyber Threat Intelligence, Wiley

CCY4502 Usable Security (HCI)**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CCY2001	4	7/8	2	2	--	3

COURSE AIM

To get the students to:

- Design for security and privacy from a user-centered perspective
- Explore different Human-computer interaction techniques.
- Learn how to design and build secure systems with a human-centric focus.
- Learn about basic principles of human-compute and apply these insights to the design of secure systems

COURSE WEEKLY CONTENTS

- 1 Course Aim and Course outline, Fundamentals of Human-Computer Interaction: users, usability, tasks
- 2 Cognitive models
- 3 Design for usability
- 4 Prototyping, cybersecurity case study
- 5 Usability studies and testing
- 6 Quantitative and qualitative evaluation, cybersecurity case study
- 7 7th week Assessment
- 8 Strategies for Secure Interaction Design
- 9 Authority and guidelines for interface design
- 10 Usable Authentication: authentication mechanisms
- 11 Biometrics, two-factor authentication
- 12 12th week Assessment
- 13 Usable Privacy: privacy settings, and a user-centric privacy space framework
- 14 Personal data sharing
- 15 Data inference

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		3 0	M A R K S		→	30
8 to 12	←		2 0	M A R K S		→	20
1 to 15	←		1 0	M A R K S		→	10
16 or 17	Final Exam						40

REFERENCES

Textbook	Lorrie Faith Cranor; Simson Garfinkel, Security and Usability: Designing Secure Systems that People can Use, O'reilly Media
	Simson Garfinkel and Heather Richter Lipford. Usable security: History, Themes, and Challenges, Springer

4.3.3. Professional and Practical Training

CIT3200 Professional Training in Mobile Apps Programming

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
-	3	5	2	0	0	0

COURSE AIM

This course provides programming technologies, design and development related to mobile applications. Topics include accessing device capabilities, industry standards, operating systems, and programming for mobile applications using an OS Software Development Kit (SDK).

COURSE WEEKLY CONTENTS

- 1 Introduction to Android
- 2 Create first Android app , Build Layout
- 3 Get User input , Display User list
- 4 Navigation , Navigate between Screens
- 5 Navigation component , Architecture Components
- 6 Advanced Navigation , Adaptive Layouts
- 7 Coroutines
- 8 Get Data from internet
- 9 Data Management , Introduction to SQL, Room, and Flow
- 10 Data Persistence using Room
- 11 Work Manager (Task Scheduling)
- 12 Debugging and Logging
- 13 Testing Fundamentals
- 14 Automated UI Tests
- 15 Revision

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.
1 to 7	←		30	MARKS		→
8 to 12	←		20	MARKS		→
1 to 15	←		10	MARKS		→
16 or 17	Final Exam					