الباب الثالث

المتطلبات الدراســـية

متطلبات العلوم (الإنسانية ـ الأساسية)

متطلبات العوم (البرنامج والتخصص)

تم المسح الضوئي بـ CamScanner

مادة (28) الدرجة العلمية:

تمنح وزارة التعليم العالي والبحث العلمى بناءً على طلب مجلس إدارة المعهد العالى للحاسب الآلى وإدارة الأعمال درجة بكالوريوس علوم الحاسب والذكاء الاصطناعى، وذلك بشرط اجتياز الطالب بنجاح دراسة عدد (140) ساعة معتمدة، تتضمن متطلبات (العلوم الانسانية – العلوم الأساسية – متطلبات المعهد – التخصص)، وبمعدل تراكمي (CGPA) لا يقل عن (2)، على ألا تقل عدد سنوات الدراسة عن ثلاثة سنوات دراسية، طبقا للتوزيع التالى:

البند		عدد الساعات		نسبة الساعات المعتمدة لكل تخصص إلى اجمالى ساعات البرنامج	النسب طبقاً لـ NARS
متطلبات (مقررات انسانيات - اجتماعية)		10		٪7.14	٪ 10 - 8
العلوم الأساسية	مقررات اجبارية	18		٪ 17.14	٪ 18 - 16
	مقررات اختيارية	6			
متطلبات المعهد	مقررات اجبارية	45	39	٪32.14	36 ٪ - 31
	مقررات اختيارية		6		
متطلبات التخصص	العلوم التخصصية (إجبارية)	57	45	٪ 39.29	٪ 40 - 34
	العلوم التخصصية (اختيارية)		12		
	تدريب العملى (الميدانى) *(لا يجوز للطالب التسجيل في الفصل الصيفي إذا كان الطالب ملتحقا بالتدريب العملى)	-	-	-	-
	مشـــروع تخرج	4	4	٪4.29	٪ 5 - 3
المجمـــــوع		140		٪ 100	

وتشتمل مقررات اللائحة على القوائم الدراسية المختلفة فى البرنامج موضح عدد الساعات المعتمدة لكل مقرر، وما يناظرها من الساعات الفعلية للتدريس وما يدعمها من المعامل والتمارين، مع توضيح نوعية هذا المقرر كما هو موضح بالجداول التالية:

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1) متطلبات العلوم الانسانية:

يجب أن يجتاز الطالب متطلبات العلوم الإنسانية والاجتماعية التي تمثل مقررات القضايا المجتمعية، لغة انجليزية، الذكاء الاصطناعي والتحول الرقمي في المجتمع، وعددها (10) ساعات معتمدة، ولا يضاف درجاتها الى المجموع التراكمى للطالب.

م	كود المقرر	اســـــم المقـــــرر	محاضرة	تمارين/ عملي	الساعات المعتمدة	المتطلبات السابقة
1	HU101	القضايا المجتمعية Societal issues	دراسة ذاتية		2	---
2	HU102	لغة انجليزية English Language	2	-	2	---
5	HU103	مهارات التواصل والعرض الفعال Effective Communication and Presentation Skills	2	-	2	---
4	HU104	الذكاء الاصطناعي والتحول الرقمى في المجتمع Artificial Intelligence and Digital Transformation in Society	2	-	2	---
3	HU205	الكتابة العلمية والفنية Technical and Scientific Writing	2	-	2	---

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2) متطلبات العلوم الأساسية

يجب أن يجتاز الطالب متطلبات العلوم الأساسية (مقررات الرياضيات–الإحصاء– الفيزياء والالكترونيات) التي تخدم الدراسة في تخصصات الكلية وعددها **(24)** ساعة معتمدة، منها عدد **(18)** إجبارية، وعدد **(6)** اختيارية.

أ) متطلبات العلوم الأساسية الإجبارية (18) ساعة معتمدة:

م	كود المقرر	اسم المقـــــرر	محاضرة	تمارين/ عملي	معتمدة	المتطلبات السابقة
.1	BS101	الرياضيات في علوم الحاسب Mathematics in Computer Science	2	2	3	----
.2	BS102	إلكترونيات Electronics	2	2	3	---
.3	BS103	تراكيب محددة Discrete Structures	2	2	3	----
.4	BS104	الجبر الخطي Linear Algebra	2	2	3	-----
.5	BS105	تطبيقات الاحتمالات والإحصاء فى الحاسب Probability and Statistics	2	2	3	-----
.6	BS209	نظرية الأعداد Number Theory	2	2	3	BS103 Discrete Structures
إجمالي عدد الســـــاعات						**18 ساعة معتمدة**

بـ متطلبات العلوم الأساسية الاختيارية: (6) ساعة معتمدة:

م	كود المقرر	اســـم المقـــــرر	محاضرة	تمارين/ عملي	معتمدة	المتطلبات السابقة
.1	BS107	أساسيات الفيزياء Fundamentals of Physics	2	2	3	----
.2	BS108	الأخلاق المهنية لعلوم الحاسب Professional Ethics for Computer Science	2	2	3	----
.3	BS211	معادلات الفروق والمعادلات التفاضلية Difference & Differential Equations	2	2	3	BS101 Mathematics in Computer Science
.4	BS212	تحليل عددي Numerical Analysis	2	2	3	BS101 Mathematics in Computer Science

تم المسح الضوئي بـ CamScanner

م	كود المقرر	اســـم المقـــــرر	محاضرة	تمارين/ عملي	معتمدة	المتطلبات السابقة
.5	BS213	تطبيقات الاحتمالات والإحصاء المتقدمة فى الحاسب Advanced Probability and Statistics Applications in Computer	2	2	3	BS105 Probability and Statistics Applications in Computer
.6	BS214	بحوث عمليات Operations Research	2	2	3	BS105 Probability and Statistics Applications in Computer
.7	BS215	التفكير العلمى والإبداعي Creative and Scientific Thinking	3	-	3	-----
.8	BS216	تسويق ومبيعات Marketing and Sales	3	-	3	----
.9	BS217	الرياضيات الحاسوبية للتعلم وعلوم البيانات Computational Mathematics for Learning and Data Science	2	2	3	BS101 Mathematics in Computer Science

3) متطلبات المعهد:

يجب أن يجتاز الطالب متطلبات المعهد الخاصة بالبرنامج وتتضمن مقررات (الرياضيات– الإحصاء – الالكترونيات–علوم الحاسب) التي تخدم الدراسة في تخصصات الكلية وعددها (45) ساعة معتمدة، منها عدد (39) إجبارية، وعدد (6) اختيارية.

أ) متطلبات المعهد الإجبارية (39) ساعة معتمدة:

م	كود المقرر	اسم المقـــــرر	محاضرة	تمارين/ عملي	معتمدة	المتطلبات السابقة
.1	CS101	أساسيات علوم الحاسب Computer Science Fundamentals	2	2	3	----
.2	CS102	البرمجة الهيكلية Structured Programming	2	2	3	----
.3	CS103	البرمجة الشيئية Object Programming	2	2	3	----
.4	CS204	تراسل البيانات Data Communication	2	2	3	----

تم المسح الضوئي بـ CamScanner

م	كود المقرر	اسم المقـــــرر	محاضرة	تمارين/ عملي	معتمدة	المتطلبات السابقة
.5	CS205	تصميم منطقي Logic Design	2	2	3	---
.6	CS206	هياكل البيانات Data Structures	2	2	3	CS102 Structured Programming
.7	CS207	نظم قواعد البيانات Database Systems	2	2	3	CS101 Computer Science Fundamentals
.8	CS208	تحليل وتصميم النظم Systems Analysis and Design	2	2	3	---
.9	CS209	شبكات الحاسب Computer Networks	2	2	3	CS204 Data Communication
.10	AI210	مقدمة في الذكاء الاصطناعي Introduction to Artificial Intelligence	2	2	3	CS102 Structured Programming
.11	CS211	نظم التشـــغيل Operating Systems	2	2	3	CS101 Computer Science Fundamentals
.12	CS319	هندسة البرمجيات Software Engineering	2	2	3	----
.13	AI432	أساسيات أنظمة الروبوتات Fundamentals of Robotic systems	2	2	3	A210 Introduction to Artificial Intelligence
إجمالي عدد الســـــاعات					**39 ساعة معتمدة**	

بـ متطلبات المعهد الاختيارية: (6) ساعة معتمدة

م	كود المقرر	اســـم المقـــــرر	محاضرة	تمارين/ عملي	معتمدة	المتطلبات السابقة
.1	CS213	تكنولوجيا الانترنت Internet Technology	2	2	3	----
.2	CS214	برمجة الويب Web Programming	2	2	3	----
.3	CS215	إدارة مشاريع البرمجيات Software Project Management	2	2	3	----
.4	CS216	تطوير المنتجات الجديدة والابتكار New Product Development and Innovation	2	2	3	----

تم المسح الضوئي بـ CamScanner

.5	CS217	ابتكار نظم المعلومات والتقنيات الجديدة IS Innovation and New Technologies	2	2	3	----
.6	CS218	الوسائط المتعددة Multimedia	2	2	3	----

4) متطلبات التخصص لبرنامج علوم الحاسب والذكاء الاصطناعى

Computer Science & Artificial Intelligence Program

يجب أن يجتاز الطالب متطلبات التخصص التي تمثل متطلبات المقررات وعددها (57) ساعة معتمدة مقسمة الى عدد (45) ساعة معتمدة اجبارية، وعدد (12) ساعات معتمدة اختيارية، بالإضافة الى التدريب العملى (الصيفي)، وعدد (4) ساعة معتمدة مشروع التخرج.

أ ـ مقررات تخصص (علوم الحاسب والذكاء الاصطناعى) الإجبارية: (45) **ســـــاعة معتمدة**:

م	كود المقـــرر	اســـم المقـــــرر	محاضرة	تمارين/ عملي	معتمدة	المتطلبات السابقة
-1	CS320	إشارات ونظم Signals and Systems	2	2	3	CS204 Data Communication
-2	AI321	الحوسبة المرنة Soft Computing	2	2	3	CS102 Structured Programming
-3	AI322	تصميم المترجمات Compilers Design	2	2	3	CS102 Structured Programming
-4	CS323	تصميم وتحليل خوارزميات Design and Analysis of Algorithms	2	2	3	CS206 Data Structures
-5	AI324	بنية وتنظيم الحاسب Computer Architecture and Organization	2	2	3	CS205 Logic Design
-6	AI325	تعلم الآلة Machine Learning	2	2	3	CS103 Object Programming
-7	CS326	معالجة الصور Image Processing	2	2	3	BS104 Linear Algebra
-8	CS327	الرسم بالحاسب Computer Graphics	2	2	3	CS102 Structured Programming
-9	CS328	التشفير Cryptography	2	2	3	BS103 Discrete Structures

تم المسح الضوئي بـ CamScanner

م	كود المقرر	اسم المقرر	محاضرة	تمارين/ عملي	معتمدة	المتطلبات السابقة
-10	CS429	الحوسبة المتوازية والموزعة Parallel and Distributed Computing	2	2	3	CS206 Data Structures
-11	CS430	النمذجة والمحاكاة Modeling and Simulation	2	2	3	AI324 Computer Architecture and Organization
-12	CS431	الرؤية بالحاسب Computer Vision	2	2	3	CS103 Object Programming
-13	AI433	الذكاء التطوري والسرب Evolutionary and Swarm Intelligence	2	2	3	AI210 Introduction to Artificial Intelligence
-14	AI434	التعرف على الأنماط Pattern Recognition	2	2	3	AI325 Machine Learning
-15	AI435	التطبيقات الذكية Smart Applications	2	2	3	AI210 Introduction to Artificial Intelligence
إجمالي الساعات					45 ساعة معتمدة	

أ ـ مقررات تخصص (علوم الحاسب والذكاء الاصطناعى) الاختيارية: (12) ســـاعة معتمدة:

م	كود المقرر	اسم المقرر	محاضرة	تمارين/ عملي	معتمدة	المتطلبات السابقة
-1	CS336	معالجة الإشارات الرقمية Digital Signal Processing	2	2	3	BS101 Mathematics in Computer Science
-2	CS337	تأمين المعلومات Information Security	2	2	3	BS104 Probability and Statistics Applications in Computer
-3	CS338	التنقيب عن البيانات Data Mining	2	2	3	CS207 Database Systems
-4	CS339	تفاعل الانسان مع الحاسب Human Computer Interaction	2	2	3	CS211 Operating Systems
-5	AI340	الذكاء الاصطناعي المتقدم Advanced Artificial Intelligence	2	2	3	AI210 Introduction to Artificial Intelligence

تم المسح الضوئي بـ CamScanner

م	كود المقرر	اسم المقرر	محاضرة	تمارين / عملى	معتمدة	المتطلبات السابقة
-6	AI341	المعالجات الدقيقة ولغة التجميع Microprocessors and Assembly Language	2	2	3	CS102 Structured Programming
-7	CS443	الذكاء الاصطناعي للروبوت Artificial Intelligence for Robotics	2	2	3	AI210 Introduction to Artificial Intelligence
-8	AI444	معالجة الكلام Speech Processing	2	2	3	CS103 Object Oriented Programming
-9	AI445	برمجة الروبوت Robot Programming	2	2	3	AI210 Introduction to Artificial Intelligence
-10	AI446	البرمجة لحل المشكلات Programming for Problem Solving	2	2	3	CS103 Object Programming
-11	AI447	النظم المدمجة Embedded Systems	2	2	3	CS206 Data Structures
-12	CS448	انترنت الأشياء Internet of Things	2	2	3	CS209 Computer Networks
-13	CS449	معالجة اللغات الطبيعية Natural Language Processing	2	2	3	AI210 Introduction to Artificial Intelligence
-14	AI450	التعلم العميق Deep Learning	2	2	3	AI325 Machine Learning
-15	AI451	الوكلاء الأذكياء Intelligent Agents	2	2	3	CS103 Object Programming
-16	CS452	اتجاهات جديدة في علوم الحاسب New trends in Computer Science	2	2	3	----
-17	AI453	اتجاهات جديدة في الذكاء الاصطناعى New trends in Artificial Science	2	2	3	----

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جـ- التدريب العملي (الميدانى): (0) ساعات معتمدة

يؤدى الطالب بعد اجتيازه عدد **(65)** ساعة معتمدة (كحد أدنى) تدريباً عملياً بالمعهد او خارج المعهد خلال العطلة الصيفية لفترة ثلاثة أسابيع (كحد أدنى)، ويقسم الطلاب إلى مجموعات يشرف عليها أعضاء هيئة التدريس، ويتوج هذا التدريب بأن يقوم الطلاب بتنفيذ عدة مشاريع مستخدمين أحدث حزم البرامج، **ولا يسمح للطالب بالتسجيل فى الفصل الدراسي الصيفي إذا كان ذلك يتعارض مع التدريب العملى،** ويعتبر التدريب متطلب أساسي للتخرج، ولا يحصل الطالب على شهادة تخرجه إلا بعد اجتياز التدريب.

كود التدريب	الساعات المعتمدة	المتطلبات السابقة
TRCAI301	-	اجتياز الطالب عدد (65) ساعة معتمدة كحد أدنى

د- مشروع التخرج: (4) **ساعات معتمدة**

يقوم الطالب بتسجيل مقرر (مشروع التخرج) بعد اجتيازه لعدد (95) ساعة معتمدة كحد أدنى تحت اشراف عضو هيئة تدريس يرشحه مجلس ادارة البرنامج المختص، ويخصص لمشروع التخرج عدد (4) ساعات معتمدة طوال العام الجامعى، ويتم مناقشة المشروع في نهاية العام، وتوزع درجاته بواقع 40% تقييم للمشرف على الطالب (موزعة الى 20% شفوى و20% للمتابعة الدورية) و60% على جودة المقال أو المشروع يقيمها لجنة حكم ثلاثية تشكل من قبل مجلس ادارة البرنامج المختص لمناقشة الطالب في نهاية العام الدراسى طبقاً لجداول تحددها مجلس إدارة البرنامج.

مشروع التخرج	الفصل الدراسي الأول	الفصل الدراسي الثانى	معتمدة	متطلب سابق
PRCAI401	2	2	4	اجتياز الطالب عدد (95) ساعة معتمدة لتسجيل مقرر مشروع التخرج طوال العام

سلطان

تم المسح الضوئي بـ CamScanner

نموذج الخطة الدراسية الاسترشادية

المستوى الأول (Freshman) - عام

الفصل الدراسى الأول					
كود المقرر	اسم المقرر	نظري	عملي/ تمارين	معتمدة	متطلب سابق
HU101	القضايا المجتمعية Societal issues	2	-	2	---
HU102	English Language	2	-	2	---
BS101	Mathematics in Computer Science	2	2	3	---
CS101	Computer Science Fundamentals	2	2	3	---
CS102	Structured Programming	2	2	3	---
BS102	Electronics	2	2	3	---
XX	Elective Basic Course (1)	2	2	3	---
المجموع				19 ساعة معتمدة	

الفصل الدراسى الثاني					
كود المقرر	اسم المقرر	نظري	عملي/ تمارين	معتمدة	متطلب سابق
HU102	Effective Communication and	2	-	2	---
HU104	Artificial Intelligence and Digital Transformation in Society	2	-	2	----
BS103	Discrete Structures	2	2	3	-----
CS103	Object Programming	2	2	3	---
BS104	Linear Algebra	2	2	3	----
BS105	Probability and Statistics Applications in Computer	2	2	3	----
XX	Elective Basic Course (2)	2	2	3	
المجموع				19 ساعة معتمدة	

تم المسح الضوئي بـ CamScanner

المســـــتوى الثاني (Sophomore)- عام

الفصل الدراسى الأول					
كود المقرر	اسم المقرر	نظري	عملي/ تمارين	معتمدة	متطلب سابق
HU203	Technical and Scientific Writing	2	-	2	---
BS206	Number Theory	2	2	3	BA103 Discrete Structures
CS204	Data Communication	2	2	3	----
CS205	Logic Design	2	2	3	----
CS206	Data Structures	2	2	3	CS102 Structured Programming
XX	Inst. Elective Course (1)	3	-	3	---
المجموع				17 ساعة معتمدة	

الفصل الدراسى الثاني					
كود المقرر	اسم المقرر	نظري	عملي/ تمارين	معتمدة	متطلب سابق
Math0	Complementary Mathematics for Science Students (Math2)	Self-Study			
CS207	Database Systems	2	2	3	CS101 Computer Science Fundamentals
CS208	Systems Analysis and Design	2	2	3	----
CS209	Computer Networks	2	2	3	CS204 Data Communication
AI210	Introduction to Artificial Intelligence	2	2	3	CS102 Structured Programming
CS211	Operating Systems	2	2	3	CS101 Computer Science Fundamentals
XX	Inst. Elective Course (2)	3	-	3	
المجموع				18 ساعة معتمدة	

تم المسح الضوئي بـ CamScanner

المســـــتوى الثالث (Junior)

الفصل الدراسى الأول					
كود المقرر	اسم المقرر	نظري	عملي/ تمارين	معتمدة	متطلب سابق
CS320	Signals and Systems	2	2	3	CS204 Data Communication
CS319	Software Engineering	2	2	3	----
AI321	Soft Computing	2	2	3	CS102 Structured Programming
AI322	Compilers Design	2	2	3	CS102 Structured Programming
CS323	Design and Analysis of Algorithms	2	2	3	CS206 Data Structures
XX	Elective Specialist Course (1)	2	2	3	
المجموع				18 ساعة معتمدة	

الفصل الدراسى الثاني					
كود المقرر	اسم المقرر	نظري	عملي/ تمارين	معتمدة	متطلب سابق
AI324	Computer Architecture and Organization	2	2	3	CS205 Logic Design
AI325	Machine Learning	2	2	3	CS103 Object Programming
CS326	Image Processing	2	2	3	CS103 Object Programming
CS327	Computer Graphics	2	2	3	CS102 Structured Programming
CS328	Cryptography	2	2	3	BS103 Discrete Structures
XX	Elective Specialist Course (2)	2	2	3	
المجموع				18 ساعة معتمدة	

*** التدريب العملي (الميدانى):** (0) ســاعات معتمدة: يؤدى الطالب بعد اجتيازه عدد (65) ســاعة معتمدة (كحد أدنى) تدريباً عملياً داخل او خارج المعهد خلال العطلة الصيفية لمدة ثلاثة أسابيع (كحد أدنى).

تم المسح الضوئي بـ CamScanner

المســـــتوى الرابع (Senior)

الفصل الدراسى الأول					
كود المقرر	اسم المقرر	نظري	عملي/ تمارين	معتمدة	متطلب سابق
CS429	Parallel and Distributed Computing	2	2	3	CS206 Data Structures
CS430	Modeling and Simulation	2	2	3	AI324 Computer Architecture and Organization
CS431	Computer Vision	2	2	3	CS103 Object Programming
PRCAI401	Project	2	4	4	Pass (95) Credit hours
XX	Elective Specialist Course (3)	2	2	3	
المجموع				16 ساعة معتمدة	

الفصل الدراسى الثاني					
كود المقرر	اسم المقرر	نظري	عملي/ تمارين	معتمدة	متطلب سابق
AI432	Fundamentals of Robotic Systems	2	2	3	CS209 Computer Networks
AI433	Evolutionary and Swarm Intelligence	2	2	3	AI210 Introduction to Artificial Intelligence
AI434	Pattern Recognition	2	2	3	CS326 Image Processing
AI435	Smart Applications	2	2	3	AI210 Introduction to Artificial Intelligence
PRCAI401	Project	-	-	-	
XX	Elective Specialist Course (4)	2	2	3	
المجموع				15 ساعة معتمدة	

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الباب الرابع

المحتوى العلمى للمقررات

- متطلبات العلوم الانسانية
- متطلبات العلوم الأساسية
- متطلبات المعهد
- متطلبات تخصص علوم الحاسب والذكاء الاصطناعى

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أولاً: متطلبات العلوم الإنسانية

HU101	Societal Issues	2
Prerequisites		----

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
-	-	-

Required SWL	110	Equivalent ECTS	3.43

Course Content
مفهوم القضايا الاجتماعية – أسباب المشكلات الاجتماعية – نظريات تفسير المشكلات الاجتماعية – أمثلة على القضايا المجتمعية وأسبابها وطرق الحل - حقوق الانسان - الشفافية ومكافحة الفساد - الزيادة السكانية.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☒ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☒ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
-	-		-		-	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

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HU102	English Language		2
Prerequisites			----
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
-	-	-	
Required SWL	110	Equivalent ECTS	3.43

Course Content

Core Components of a European Language Course

1. **Language Proficiency Development**
   - **Listening, Speaking, Reading, Writing**: Structured across CEFR levels (A1–C2).
   - **Grammar and Vocabulary**: Progressive mastery of linguistic structures and thematic vocabulary.
   - **Pronunciation and Phonetics**: Training in accurate and fluent speech.
2. **Cultural and Historical Context**
   - **European Culture and Society**: Exploration of traditions, customs, and social norms.
   - **History and Politics**: Understanding the historical evolution and political systems of European countries.
   - **Arts and Literature**: Study of major literary works, films, music, and visual arts.
3. **Interdisciplinary Integration (CLIL Approach)**
   - **Content and Language Integrated Learning (CLIL)**: Teaching subjects like history or science in the target language to deepen both content and language skills.
   - **Project-Based Learning**: Cultural projects, presentations, and collaborative assignments.
4. **Professional and Academic Skills**
   - **Translation and Interpretation**: Basics of translating texts and interpreting spoken language.
   - **Academic Writing and Research**: Skills for writing essays, reports, and conducting research in the target language.
   - **Business and Diplomatic Communication**: Formal writing, negotiation, and presentation skills.
5. **Immersive and Experiential Learning**
   - **Study Abroad and Internships**: Opportunities to study in European countries or work in language-related fields.
   - **Cultural Visits and Exchanges**: Field trips, virtual exchanges, and cultural immersion activities.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

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Targeted Sustainable Development Goals					
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☒ GOAL 13: Climate Action	☒ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
-	-		-		-	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)

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HU103	Effective Communication and Presentation Skills	2
Prerequisites		----

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
-	-	-

Required SWL	110	Equivalent ECTS	3.43

Course Content

يهدف المقرر إلي تنمية مهارات العرض والاتصال لدى الطلاب، وتطبيق تلك المهارات في حياتهم الجامعية والعملية – التعرف على أهمية الاتصال للطالب الجامعي – التمييز بين أشكال الاتصال (اللفظي، وغير اللفظي) – توظيف عناصر قوة الرسالة في التواصل مع الآخرين – التوظيف الإيجابي لوسائط الاتصال – تطبيق مهارات الإرسال النفسية والجسدية في التعامل مع الآخرين – التمييز بين الاتصال ومهارات الإرسال والاستقبال – تحسين مهارات الاتصال مع الذات – تفعيل مهارات استيعاب الاختلافات الثقافية– المجتمع الداخلي والخارجي– عند التواصل مع الغير – توظيف أساليب الإلقاء والخطابة في حياته الجامعية – تطبيق استراتيجيات الإلقاء الفعال – توظيف آداب مخاطبة المسؤول فى البيئة الجامعية – التعرف على طرق العرض الفعال.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☒ GOAL 6: Clean Water and Sanitation
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Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
-	-		-		-	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

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UNV104	Artificial Intelligence and Digital Transformation in Society	2
Prerequisites		----

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
-	-	-

Required SWL	110	Equivalent ECTS	3.43

Course Content

This course explores the transformative impact of Information Technology (IT) and Artificial Intelligence (AI) on modern society. It examines how these technologies are applied across various sectors, the ethical and social implications of their use, and the future challenges and opportunities they present.

Course Content Outline

Module 1: Introduction to IT and AI

- Definitions and historical development
- Key concepts in IT and AI
- Overview of current technologies and trends

Module 2: AI and IT in Everyday Life

- Smart homes and personal assistants
- Mobile technologies and apps
- Social media algorithms and personalization

Module 3: Applications in Industry

- **Healthcare**: AI diagnostics, telemedicine, health informatics
- **Education**: E-learning platforms, adaptive learning, AI tutors
- **Finance**: Fraud detection, algorithmic trading, robo-advisors
- **Agriculture**: Precision farming, crop monitoring, AI in food supply chains
- **Transportation**: Autonomous vehicles, traffic prediction, logistics optimization

Module 4: Government and Public Services

- E-governance and digital identity
- AI in law enforcement and surveillance
- Smart cities and infrastructure management

Module 5: Ethical, Legal, and Social Implications

- Data privacy and surveillance
- Bias and fairness in AI
- Job displacement and the future of work
- AI governance and regulation

Module 6: Emerging Trends and Future Outlook

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- Generative AI and creativity
- Quantum computing and AI
- Human-AI collaboration
- Sustainable and responsible AI development

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
-	-		-		-	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

HU205	**Technical and Scientific Writing**				2
Prerequisites	----				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
-		-		-	
Required SWL	110	Equivalent ECTS	3.43		
Course Content					
This course aims to give the student the basic rudiments of report writing, the rationale for report writing; the structure of reports; and such details as physical appearance and linguistic style will be discussed; In addition to writing reports, student will also be given supplementary exercises; as necessary; to enhance their general writing skills.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
-	-		-		-	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)

تم المسح الضوئي بـ CamScanner

Math0	**Complementary Mathematics for Science Students) Math2)**	**0**
Prerequisites		**----**

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
-	-	-

Required SWL	-	Equivalent ECTS	-

Course Content

Part 1 Calculus: Derivatives of the trigonometric Function-Implicit Differentiation- Parametric Differentiation-Higher - Derivatives of a function- The two equations of the tangent and the normal to a curve- Related Time Rates - number e - exponential function with the natural base- natural logarithmic function- Derivatives of exponential and logarithmic functions- Integration of exponential and logarithmic functions - Deferential of function - Definite Integral -Integration techniques.

Part 2 Algebra: Fundamentals counting principals- permutations- combinations- Binomial theorem for integer positive power - Trigonometric form of complex number- De Moivre's Theorem- Cubic root of unity - Determinants –Matrices.

Taught in Program(s)
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Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
-	-		-		-	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)

تم المسح الضوئي بـ CamScanner

ثانياً: مقـررات العلوم الأســاسـية

BS101	Mathematics in Computer Science		3
Prerequisites			----
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	155	Equivalent ECTS	5.14

Course Content

This course covers elementary mathematics for computer science. Topics include Limits and continuity, Differentiation, Integration, formal logic, proof methods, sets, relations, functions.

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

BS102	**Electronics**	3
Prerequisites	----	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	2	-

Required SWL	155	Equivalent ECTS	5.14

Course Content
Ohm's law and DC electric circuits. Basics of semi-conductors. P-N Junction and its applications. Special diodes (zener diode, varactor diode and optical devices). Bipolar junction transistor and Biasing. Field effect transistor.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

BS103	Discrete Structures		3
Prerequisites			----
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	155	Equivalent ECTS	5.14

Course Content

Graph, lattices, Trees; Algebraic Structures: semi-group, group, integer congruence's; asymptotic notation and growth of functions; permutations and combinations, counting principles; Recursive definition; state machines and invariants; recurrences; generating functions; Modeling Arithmetic, Computation, and Languages.

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

BS104	Linear Algebra		3
Prerequisites			----
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	155	Equivalent ECTS	5.14

Course Content
The course will introduce basic concepts and techniques from linear algebra that will be required in later courses in areas such as machine learning, computer graphics, and quantum computing. Topics include vector spaces and subspaces, fundamental properties of matrices including determinants, inverse matrices, matrix factorizations, eigenvalues and linear transformations. Solve linear systems of equations. In this course, the students will become comfortable working with the basic tools in linear algebra and familiar with several computer science applications.

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

BS105	Probability and Statistics Applications in Computer				3
Prerequisites	----				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		2		-	
Required SWL	155	Equivalent ECTS	5.14		
Course Content					
This course introduces you to sampling and exploring data, as well as basic probability theory and Bayes' rule. Students will examine various types of sampling methods and discuss how such methods can impact the scope of inference. A variety of exploratory data analysis techniques will be covered, including numeric summary statistics and basic data visualization. Using statistics packages (for example R and RStudio) and will use this software for lab exercises. Statistics applications in the field of computer science.					

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

BS107	Fundamentals of Physics		3
Prerequisites			----
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	155	Equivalent ECTS	5.14

Course Content
Mechanics: physics and measurements, motion in one dimension, vectors, motion in two dimensions, laws of motion, circular motion and its applications, work and energy, potential energy and conservation of energy, linear momentum and collision, rotation of a rigid body, rolling motion, law of gravity. Waves: Oscillatory motions, wave motion, sound waves. Optics: Superposition of waves, interference, diffraction and polarization. Elect of magnetic field and Farad's law, electromagnetic waves. Selected topics: Introduction to modern physics and applications, molecules and solids, superconductivity. Field, Gauss's law, magnetic field.

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As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

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☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)

تم المسح الضوئي بـ CamScanner

BS108	Professional Ethics for Computer Science		3
Prerequisites			----
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	155	Equivalent ECTS	5.14

Course Content

1. مفهوم الأخلاق وقواعدها
2. التكنولوجيا والمجتمع الافتراضي
3. جرائم الحوسبة
4. قوانين الحوسبة
5. قواعد وأخلاقيات مهنة الحوسبة

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)

تم المسح الضوئي بـ CamScanner

BS209	Number Theory	3
Prerequisites	BS103 Discrete Structures	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	2	-

Required SWL	155	Equivalent ECTS	5.14

Course Content

This course is an elementary introduction to number theory. Topics to be covered include: • Primes, Divisibility, and the Fundamental Theorem of Arithmetic • Greatest Common Divisor (GCD), Euclidean Algorithm • Congruences, Chinese Remainder Theorem, Hensel's Lemma, Primitive Roots • Quadratic Residues and Reciprocity • Arithmetic Functions, Diophantine Equations, Continued Fractions, etc.

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science &AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

BS211	Difference & Differential Equations		3
Prerequisites	BS101 Mathematics in Computer Science		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	155	Equivalent ECTS	5.14

Course Content

1. Some first order differential equations (namely linear, separable, Bernoulli and projective);
2. Systems of linear first order differential equations.
3. Linear, homogeneous and inhomogeneous higher order differential equations, also using change of variables.
4. Some types of linear, homogeneous and inhomogeneous (first order and higher order) difference equations.

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science &AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

BS212	Numerical Analysis				3
Prerequisites	BS101 Mathematics in Computer Science				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		2		-	
Required SWL	155		Equivalent ECTS		5.14

Course Content

Computational errors - Floating - Point computation - Root Finding; Bisection method, Newton's method. And secant method - Approximation Theory Polynomial approximation, least squares method, interpolation, Extrapolation, Numerical differentiation and integration - Initial value problems for ordinary differential equations: Euler method, Taylor - series methods, and Rung - Kutta methods -Multi step method.

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science &AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

BS213	**Advanced Probability and Statistics Applications in Computer**	3
Prerequisites	BS105 Probability and Statistics Applications in Computer	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	2	-

Required SWL	155	Equivalent ECTS	5.14

Course Content

Multiple Random variables, moment generating function and characteristic function. Measures of central tendency – Statistical thinking for Data Science and Analytics. Applications for computing.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science &AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

BS214	Operations Research				3
Prerequisites	BS105 Probability and Statistics Applications in Computer				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		2		-	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
Formulations and graphical solution - Algebraic solution: The simplex method and dual-simplex method - Sensitivity analysis - analysis -Transportation and assignment Problems - Integer Programming, Cutting - Plance algorithms, branch and bound method. Network analysis.					

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science &AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

BS215	Creative and Scientific Thinking		3
Prerequisites			----

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
3	-	-

Required SWL	155	Equivalent ECTS	5.14

Course Content

يهدف المقرر إلى التعريف بمفهوم الإبداع ومحاوره الرئيسة: العملية الإبداعيّة؛ والشخص المبدع؛ وبيئة الإبداع، وأسسه وعناصره ونماذجه واتجاهات دراسته وأساليب وأدوات قياسه، والعوامل المؤثرة فيه؛ والقضايا والمشكلات الرئيسة المرتبطة بالإبداع؛ والدور الاجتماعي للموهوبين. كما يقدم هذا المقرر منظور التعليم المباشر في التفكير لمساعدة الطالب على ممارسة مهارات التفكير المختلفة وتوظيفها في الدراسة والتعلم، كما يهدف إلى تدريب الطالبة على إيجاد حلول لما قد يصادفها من عقبات أو مشكلات على المستوى العلمي والمهني والشخصي. ويعتمد المقرر المنحى التدريبي من خلال تعريف وتحديد المهارة والتدرب عليها لتنميتها.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science &AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

BS216	**Marketing and Sales**	3
Prerequisites		----

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
3	-	-

Required SWL	155	Equivalent ECTS	5.14

Course Content

This course clarifies the marketing principles, concepts, and activities in nonprofit organizations. It also explains how these activities were influenced by cultural, technological surroundings. The course shows how marketing conquers the instructions goals. It also explains the four P in marketing (product, price, place, and promotion).

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science &AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

BS217	Computational Mathematics for Learning and Data Science				3
Prerequisites	BS101 Discrete Structures				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		2		-	
Required SWL	155		Equivalent ECTS		5.14

Course Content
This course introduces fundamental mathematical concepts relevant to data and computer science and provides a basis for further study in learning and data science. The topics covered are functions of several variables, series approximations, gradient descent, Matrix Decompositions, Convex sets and convex functions and their properties, Introduction to Optimization, Optimization in learning and Data Science. The course draws connections between each of these fundamental mathematical concepts and modern data science applications.

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science &AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10		20		10	60	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

ثانياً: مقررات علوم الحاسب والذكاء الاصطناعى

CS101	Computer Science Fundamentals		3
Prerequisites	----		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14
Course Content			
Basic concepts in computing and fundamental techniques for solving computational problems. I intended as a first course in computer science. Introduction to computer and information systems. Computer hardware and software components. Data representation and number systems. Introduction to networking. Basic problem solving and programming techniques; fundamental algorithms and data structures; use of computers in solving engineering and scientific problems. Introduction to specialized application areas.			
Taught in Program(s)			
As major in Program(s) Code(s)			
Computer Science & AI			
As minor in Program(s) Code(s)			

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)

تم المسح الضوئي بـ CamScanner

CS102	Structured Programming		3
Prerequisites			----
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14

Course Content

Introduces the fundamental concepts of structured programming. Topics include software development and methodology, data types, control structures, functions, arrays, Pointers and Strings, Structures and Dynamic Memory Allocation, The Preprocessor, and File Input/Output and the mechanics of running, testing, and debugging.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS103	Object Oriented Programming				3
Prerequisites	----				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155	Equivalent ECTS	5.14		
Course Content					
Object-oriented programming: data abstraction, encapsulation, classes, objects, templates, operator overloading, function overloading, inheritance, polymorphism, exception handling, and streams.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS204	Data Communication	3
Prerequisites	----	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	155	Equivalent ECTS	5.14

Course Content

Data transmission concepts, terminology and techniques, Data communication description and criteria, Components of communication system, Data communications models, Data Flow in Communication. Computer Networking Concepts, Computer Network, Network Components, Network Criteria, Physical Topology, Network Types, Switching, Internet, Internetwork, Standards and Administration. Network Model, Protocols, Protocol Layering, TCP/IP Protocol Suite, OSI Model. Analog and Digital data, Analog and Digital Signals, Transmission Impairment, Data Rate Limits. Data encoding and decoding techniques, Digital-To-Digital Conversion, Analog-To-Digital Conversion, Digital-To-Analog Conversion, Analog-To-Analog Conversion, Transmission Modes, Transmission media types and characteristics, Guided Media, Unguided Media: Wireless, Optical fiber systems, Multiplexing techniques.

Taught in Program(s)

As major in Program(s) Code(s)

Computer Science & AI

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
%10	---	%15	%15	%10	---	%50

تم المسح الضوئي بـ CamScanner

CS205	Logic Design				3
Prerequisites	-----				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
Basic logic concepts: Logic states, Boolean algebra, basic logical operations, gates and truth tables. Combinational logic: Minimization techniques, multiplexers and de-multiplexers, encoders, decoders, adders and subtractions, comparators, programmable logic arrays and memories, design with MSI, logic families, tristate devices. Sequential logic: Flip flops, mono-stable multi-vibrators, latches and registers. Counters.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☒ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☒ GOAL 10: Reduced Inequality	☒GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
%10	---	%15	%15	%10	---	%50

تم المسح الضوئي بـ CamScanner

CS206	Data Structures		3
Prerequisites	Structured Programming (CS102)		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14

Course Content

Time and space complexity, Data Structures – Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, circular linked list implementation, Double linked list implementation, insertion, deletion and searching operations. Applications of linked lists. Stacks-Operations, array and linked representations of stacks, stack applications -infix to postfix conversion, postfix expression evaluation, recursion implementation. Queues-operations, array and linked representations. Circular Queue operations, Dequeuers, applications of queues. Searching and Sorting – Sorting- selection sort, bubble sort, insertion sort, quick sort, merge sort, shell sort, radix sort, searching-linear and binary search methods, comparison of sorting and searching methods. Trees – Definitions, tree representation, properties of trees, Binary tree, Binary tree representation, binary tree properties, binary tree traversals, binary tree implementation, applications of trees.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)
Computer Science & AI

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS207	Database Systems				3
Prerequisites	Computer Science Fundamentals (CS101)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
Fundamental Database Concepts: • The Entity Relationship (ER) Model (the most common approach to conceptual database design) • The Relational Data Model – Relations – Integrity Constraints (keys, foreign keys, etc.) • Logical Database Design (ER to relational schemas). Relational Algebra. Various modern data models, data security and integrity, and concurrency.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					
Computer Science & AI					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☒ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☒ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS208	Design and Analysis of Algorithms				3
Prerequisites	----				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155	Equivalent ECTS	5.14		
Course Content					
This course introduces the fundamental techniques for designing and analyzing algorithms, including asymptotic analysis; divide-and-conquer algorithms, greedy algorithms, dynamic programming, multithreaded algorithms, number-theoretic algorithms and RSA cryptosystem, NP-completeness, and approximation algorithms.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☒ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☒ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS209	Computer Networks		3
Prerequisites	Data Communication -CS204		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14

Course Content

This course addresses the layered structure of computer communication networks, Different network topologies. It focuses on networking basics, routers, and routing basics and the most widely used TCP/IP protocol suite, Routing strategies. The course covers concepts in networking including circuit switching networks and packet switching networks; Internet routing and business relationships; IPv4 and IPv6 addressing. After completion of this course, students will have general knowledge about computer networks, a thorough understanding and practical skills of calculating, managing routers, and TCP/IP Internetworking. Students will also be able to categorize the network functions, evaluate and justify networks, and device performance using the OSI model. The course will cover the problems of Computer Networks and the standard ways to approach and resolve these problems, including relevant real-world, state-of-the-art examples. The practical for the course will allow students to apply theory to real-world examples.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
%10	---	%15	%15	%10	---	%50

تم المسح الضوئي بـ CamScanner

AI210	Introduction to Artificial Intelligence				3
Prerequisites	Structured Programming (CS102)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14

Course Content
This is an introductory course to artificial intelligence that covers fundamental topics in AI, including Fundamental issues in intelligent systems - History of artificial intelligence; Agents: Definition of agents; successful applications and state-of-the-art agent-based systems; Search: Uninformed Search Strategies, Informed (Heuristic) Search Strategies; introduction to reasoning, knowledge representation and planning.
Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☒ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☒ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

سلطان

تم المسح الضوئي بـ CamScanner

CS211	Operating Systems				3
Prerequisites	Computer Science Fundamentals (CS101)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
Types of operating systems. Operating Systems structures: system components and services, virtual machines. Process management: CPU scheduling: Scheduling concepts, performance criteria, scheduling algorithm. Memory organization and management for single user and multi-user system. Secondary storage management, Disk scheduling, virtual memory.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☒ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☒ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS213	Internet Technology		3
Prerequisites	---------		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14

Course Content
Internet TCP/IP suit, Internet domains, Addressing, Internet infrastructure and infostructure, Internet protocols, Internet hardware components, Internet accessing, Internet and Extranet, Video conferencing over Internet, Mailing Voice over IP; Multimedia communication over Internet, Audio, Video streaming Website design and application.
Taught in Program(s)
As major in Program(s) Code(s)

As minor in Program(s) Code(s)
Computer Science & AI

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☒ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☒ GOAL 10: Reduced Inequality	☒GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
%10	---	%15	%15	%10	---	%50

تم المسح الضوئي بـ CamScanner

CS214	Web Programming		3
Prerequisites	--------		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14

Course Content
This course is designed to provide the student with foundational programming knowledge and skills for application development on the Internet. There are 5 main modules we will cover in the course to introduce key web programming technologies: 1. Webpage structure and appearance with HTML5 and CSS 2. Client-side interactivity with JS DOM and events 3. Using web services (API's) as a client with JS 4. Writing web services with PHP 5. Storing and retrieving information in a database with MySQL
Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☒ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☒ GOAL 10: Reduced Inequality	☒GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
%10	---	%15	%15	%10	---	%50

تم المسح الضوئي بـ CamScanner

CS215	Software Project Management		3
Prerequisites	----		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14

Course Content
This course introduces Software Project Management. Selection of a Project Approach. Project Estimation Techniques. Project Planning and Project Scheduling. Project Organization and Team Structures. Risk Management. Resource Allocation. Project Monitoring and Control, Software Configuration Management. Software Quality Management

Taught in Program(s)					
As major in Program(s) Code(s)					

As minor in Program(s) Code(s)					
Computer Science & AI					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

سلطان

تم المسح الضوئي بـ CamScanner

CS216	New Product Development and Innovation		3
Prerequisites	----		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14

Course Content
The course will cover the process of new product development in established firms. The content will broadly cover the following topics: the role of new forms of product & service innovations in firms and their contribution to the firms' competitive advantage; and the activities involved in the development of new product starting with opportunity development and concept generation up to product testing

Taught in Program(s)					
As major in Program(s) Code(s)					

As minor in Program(s) Code(s)					
Computer Science & AI					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

تم المسح الضوئي بـ CamScanner

CS217	IS Innovation and New Technologies			3
Prerequisites	----			
Number of weekly Contact Hours				
Lecture		Tutorial		Laboratory
2		-		2
Required SWL	155	Equivalent ECTS		5.14

Course Content
This course is designed to introduce students to new and innovative technologies and examine how these powerful systems have fundamentally reshaped modern organizations along with our society. Using online collaborative technologies that were developed in the context of social networking and online communities, corporations are reengineering both internal business processes and those related to customers, suppliers, and business partners. Developing innovative ways to communicate and collaborate can lead to new business opportunities, and new efficiencies. This course investigates the technologies, methods and practices of developing innovations such as online communities, and how this knowledge and these skills are applied to re- engineer business processes.

Taught in Program(s)					
As major in Program(s) Code(s)					

As minor in Program(s) Code(s)					
Computer Science & AI					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

تم المسح الضوئي بـ CamScanner

CS218	Multimedia	3
Prerequisites	------	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	155	Equivalent ECTS	5.14

Course Content

Multimedia is the combined use of text, graphics, sound, animation, and video. The primary objective of this workshop is to teach participants how to develop multimedia programs. Another objective is to demonstrate how still images, sound, and video can be digitized on the computer. Participants in this workshop will create their own multimedia courses using Hyper Studio on the Macintosh platform. Hyper Studio is an authoring tool that allows you to develop an electronic stack of cards that contain buttons, graphics, and text. Issues concerning multimedia design and its use in education will be the focus of reading and class discussions throughout the course of the workshop.

Taught in Program(s)					
As major in Program(s) Code(s)					

As minor in Program(s) Code(s)					
Computer Science & AI					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

تم المسح الضوئي بـ CamScanner

CS319	Software Engineering	3
Prerequisites	---------	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	155	Equivalent ECTS	5.14

Course Content

Overview of software engineering, software requirement: engineering processes, system models, software prototyping. Design: architecture design, distributed system architecture, object-oriented design, user interface design. Study how to conduct software system: design V &V, management, and maintenance. Understand four dimensions of system dependability: availability, reliability, safety, security. Learn about different types of software maintenance. Be aware of the processes involved in software evolution, including the process of software re- engineering. Understand the differences between agile development methods and the traditional software development methods.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)

تم المسح الضوئي بـ CamScanner

CS320	Signals and Systems		3
Prerequisites	Data communication – CS204		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14

Course Content

1. Signal Representation
2. System Classification
3. Singularity Functions
4. Convolution
5. Fourier Series and Applications to Electric Circuits
6. Fourier Transforms
7. Nyquist Sampling Theorem
8. Fourier Analysis of Discrete Systems
9. Laplace Transforms, Transfer Functions and Applications to Electric Circuits
10. Discrete-Time Systems and Z-Transforms
11. Digital Computer Simulation

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☒ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☒ GOAL 10: Reduced Inequality	☒GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
%10	---	%15	%15	%10	---	%50

تم المسح الضوئي بـ CamScanner

AI321	Soft Computing				3
Prerequisites	Introduction to Artificial Intelligence (AI206)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
This course will cover fundamental concepts used in soft computing techniques. The concepts of Neural Networks, Fuzzy Logic and Applications of Soft Computing techniques to solve several real-life problems will be covered to have hands on practices. In summary, this course will provide exposure to theory as well as practical systems and software used in soft computing. After completing this course, you will be able to learn: Fuzzy logic and its applications, artificial neural networks and its applications, Applications of Soft computing to solve problems in varieties of application domains.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☒ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☒ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

AI322	Compiler Design				3
Prerequisites	Structure Programming- CS102				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
Parsing Analysis: top-down parsing, Syntactical specifications of languages. Lexical bottom-up parsing, LL-parsers, LR-parsers. Semantic analysis. Intermediate code. generation. Error detection and error handling.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS323	Design and Analysis of Algorithms				3
Prerequisites	Data Structure – CS206				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
This course introduces the fundamental techniques for designing and analyzing algorithms, including asymptotic analysis; divide-and-conquer algorithms, greedy algorithms, dynamic programming, multithreaded algorithms, number-theoretic algorithms and RSA cryptosystem, NP-completeness, and approximation algorithms.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

AI324	Computer Architecture and Organization				3
Prerequisites	Logic Design – CS205				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
Computer basic units' organization and design: memory, control, arithmetic and logic unit, input/output. Computer instructions and addressing modes, timing and control, execution cycle of instructions. Input, output and interruption. Arithmetic processor algorithms. Hardwired versus microprogramming control organization.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
%10	---	%15	%15	%10	---	%50

تم المسح الضوئي بـ CamScanner

AI325	Machine Learning				3
Prerequisites	Object Oriented Programming (CS103)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155	Equivalent ECTS		5.14	
Course Content					
Introduction to Machine Learning, a Formal Learning Model, The Bias-Complexity Tradeoff, Decision Tree learning, Instance based learning, Supervised learning (Classification, Regression and Forecasting), Unsupervised learning (clustering and dimension reduction), Semi-supervised learning.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS326	Image Processing		3
Prerequisites	Linear Algebra (BS104)		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	155	Equivalent ECTS	5.14

Course Content

Digital image fundamentals ; Image enhancement in the spatial domain: grey level transformation; Histogram processing; Spatial filters; Image enhancement in frequency domain: 2-D Fourier transform; Other transforms; Smoothing filters; Sharpening filters; Image restoration; Noise model; Estimating the degradation function; Wiener filter ; Geometric transformations; Image segmentation : detection of discontinuities; edge linking and boundary detection; Thresholding; Region based segmentation; Morphological image processing: operation concepts; some basic algorithms.

Taught in Program(s)

As major in Program(s) Code(s)

Computer Science & AI

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS327	Computer Graphics		3
Prerequisites	Structure Programming (CS102)		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14

Course Content
Introduction to Computer Graphics; Overview of Graphics systems; Line drawing algorithms; Circle drawing algorithms; Ellipse drawing algorithms; Area filling algorithms; Polygon filling algorithms; Line clipping algorithms; Polygon clipping algorithms; Two dimensional transformations; (translation – rotation – scaling – general transformations – composite transformations); Three-dimensional object representation and Projections; Three-dimensional modeling and transformations. (Translation – rotation – scaling – sheer – reflection – composite); Three-dimensional Viewing and Camera Model.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS328	Cryptography	3
Prerequisites	Discrete Structure (BS103)	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	155	Equivalent ECTS	5.14

Course Content

The specific topics will include:
- Introduction, need of security. History.
- Substitution and monoalphabetic ciphers.
- Vigenere cipher, coincidence index.
- A touch of number theoretical algorithms.
- Private key cryptography.
- Data Encryption Standard - DES.
- Rijndael, Advanced Encryption Standard - AES.
- Secure hashing algorithms - SHA-family, NIST competition.
- Public key cryptography. One-way functions.
- Rivest-Shamir-Adleman cryptosystem - RSA. RSA-xxx challenges.
- Overview of ElGamal cryptosystem, discrete logarithms, digital signatures.

Taught in Program(s)

As major in Program(s) Code(s)

Computer Science & AI

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS336	Digital Signal Processing				3
Prerequisites	Math. In Computer Science – BS101				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
Review of principles of discrete signals in time and frequency; Transform-domain representations of discrete time sequences; Fast Fourier transform; Structural representations of digital filters; Digital Filter design problems; Implementation aspect of DSP algorithms; filter banks and wavelets; spectral estimation; Multirate Signal Processing; Applications.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					
Cyber Security and Digital Forensics					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
%10	---	%15	%15	%10	---	%50

تم المسح الضوئي بـ CamScanner

CS337	Information Security		3
Prerequisites	Probability And Statistics Applications in Computer Science		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14

Course Content

In this course students learn the basics of information security, in both management aspect and technical aspect. Students understand various types of security incidents and attacks and learn methods to prevent detecting and reacting to incidents and attacks. Students will also learn the basics of the application of cryptography, which are one of the key technologies to implement security functions.

Major Topics to be Include:

1. Introduction to Information Security: Attacks, Vulnerability, Security Goals, Security Services, and mechanisms
2. Conventional Cryptograph Techniques: Conventional substitution and transposition ciphers, One time Pad, Block cipher and Stream Cipher, Steganography
3. Symmetric and Asymmetric Cryptographic Techniques: DES, AES, RSA algorithms
4. Authentication and Digital Signatures: Use of Cryptography for authentication, Secure Hash function, Key management - Kerberos
5. Program Security: No malicious Program errors— Buffer overflow, Incomplete mediation, Time of check to Time use Errors, Viruses, Trapdoors, Salami attack, Man-in-the- middle attacks, Covert channels.
6. Security in Networks: Threats in networks, Network Security Controls Architecture, Encryption, Content Integrity, Strong Authentication, Access Controls, Wireless Security, Honeypots, Traffic flow security, Firewalls - Design and Types of Firewalls, Personal Firewalls, IDS, Email Security- PGP, S/MIME

- Understanding of Kali Linux Fundamentals
- Familiarity with Penetration Testing
- Knowledge of Red Teaming
- Understanding the responsibilities of SOC
- Basic knowledge of Networking
- XSS and XXE Vulnerability Identification
- Acquaintance with Burp Suite
- SQL Injection Identification

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

تم المسح الضوئي بـ CamScanner

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
%10	---	%15	%15	%10	---	%50

تم المسح الضوئي بـ CamScanner

CS338	Data Mining		3
Prerequisites	Data base Systems – Cs207		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14

Course Content

This course is an introductory course on data mining. It introduces the basic concepts, principles, methods, implementation techniques, and applications of data mining, with a focus on two major data mining functions: (1) pattern discovery and (2) cluster analysis.
Major Topics to be Included
1. overview over various types of data (for example tables, text, graphs) and their properties,
2. an overview of different methods to explore large amounts of data, data preprocessing (for example normalization, PCA),
3. introduction to classification methods (for example k-NN, C4.5),
4. introduction to clustering methods (for example k-means, single-link, DB-Scan, graph clustering algorithms),
4. introduction to association analysis (for example Apriori),
5. social and ethical aspects in the area of data mining, validation.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
%10	---	%15	%15	%10	---	%50

تم المسح الضوئي بـ CamScanner

CS339	Human Computer Interaction				3
Prerequisites	CS211 – Operating Systems				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14

Course Content
students are introduced to the fundamental theories and concepts of human computer interaction (HCI). HCI is an interdisciplinary field that integrates theories and methodologies across many domains including cognitive psychology, neurocognitive engineering, computer science, human factors, and engineering design. Students will gain theoretical knowledge of and practical experience in the fundamental aspects of human perception, cognition, and learning relates to the design, implementation, and evaluation of interfaces.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)
Cyber Security and Digital forensics

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
%10	---	%15	%15	%10	---	%50

تم المسح الضوئي بـ CamScanner

AI340	Advanced Artificial Intelligence				3
Prerequisites	Introduction to Artificial Intelligence (AI210)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
This course will cover several advanced topics in Artificial Intelligence. Topics may include probabilistic reasoning, constraint satisfaction, reactive systems, knowledge-based learning, emergent behavior, intelligent multiagent systems, Probabilistic reasoning, Markov decision processes, hidden Markov models, Bayes nets.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

AI341	Microprocessors and Assembly Language				3
Prerequisites	Structure Programming – CS102				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
This course includes an introduction to the 32-bit Intel architecture with programming techniques utilizing the Intel microprocessor and coprocessor family. Concepts include programming modes, branching, flags, stacks, procedures, macros, interrupts, arithmetic and logic operations, multiple precision arithmetic and string operations.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS429	Parallel and Distributed Computing				3
Prerequisites	Structured Programming (CS206)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14

Course Content

This course will cover widely used parallel and distributed computing methods. Topics will include:

- Introduction to Parallel and Distributed Computing
- Flynn's Taxonomy, Introduction to Multi-Threading
- parallel algorithms & architectures, parallel I/O
- programming models (data-parallel, task-parallel, process-centric, shared/distributed memory)
- Introduction to Parallel Programming using OpenMP
- performance analysis and tuning, scalability and performance studies
- scheduling, load balancing, memory consistency model, memory hierarchies,
- Case Studies: From problem specification to a parallelized solution
- GPU architecture and programming, heterogeneity, Introduction to OpenCL
- power and energy consumption storage systems, and synchronization
- Message passing interface (MPI),
- concurrency control
- fault tolerance, interconnection topologies
- Asynchronous/synchronous computation/communication, concurrency control, fault tolerance,
- Advanced topics in parallel and Distributed computing

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

تم المسح الضوئي بـ CamScanner

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS430	Modeling and Simulation				3
Prerequisites	Computer Architecture and Organization (AI324)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
This course introduces fundamentals and techniques for designing and using simulation, modeling, and optimization algorithms with applications in system performance modeling, business infrastructure modeling, an introduction to advanced complex systems models.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS431	Computer Vision		3
Prerequisites	Object Oriented Programming (CS103)		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14

Course Content

This course introduces computer vision including fundamentals of image formation; camera imaging geometry; feature detection and matching; Multiview geometry including stereo, motion estimation and tracking; and classification. We'll develop basic methods for applications that include finding known models in images, depth recovery from stereo, camera calibration, image stabilization, automated alignment (e.g. panoramas), tracking, action recognition, and shape from X.

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS432	Fundamentals of Robotic				3
Prerequisites	Introduction to Artificial Intelligence (AI210)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
This course introduces Robot Anatomy-Definition, law of robotics, History and Terminology of Robotics Accuracy and repeatability of robotics Simple Problems-Specifications of Robot Speed of Robot-Robot joints and links-Robot Classifications-Architecture of robotic systems-Robot Drive systems-Hydraulic, Pneumatic and Electric system. - Mechanical grippers-Slider crank mechanism, Screw type, Rotary actuators, cam type-Magnetic Grippers-Vacuum grippers-Air operated grippers-Gripper force analysis Gripper design-Simple problems-Robot controls-Point to point control, Continuous path control, Intelligent robot-Control system for robot joint-Control actions-Feedback devices-Encoder, Resolver, LVDT-Motion Interpolations-Adaptive control - Robot Kinematics Types- 2D, 3D Transformation-Scaling, Rotation, Translation Homogeneous coordinates, multiple transformation-Simple problems. Sensors in robot – Touch sensors-Tactile sensor – Proximity and range sensors – Robotic vision sensor-Force sensor-Light sensors, Pressure sensors - Robot work cell design and control-Sequence control, Operator interface, Safety monitoring devices in Robot-Mobile robot working principle, actuation using MATLAB, NXT Software Introductions-Robot applications- Material handling, Machine loading and unloading, assembly, Inspection, Welding, Spray painting and undersea robot - Micro/Nanorobotics system overview-Scaling effect-Top down and bottom up approach- Actuators of Micro/Nano robotics system-Nanorobot communication techniques-Fabrication of micro/nano grippers-Wall climbing micro robot working principles-Biomimetic robot-Swarm robot-Nanorobot in targeted drug delivery system.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
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Assessment Weights					

تم المسح الضوئي بـ CamScanner

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

AI433	Evolutionary and Swarm Intelligence				3
Prerequisites	Introduction to Artificial Intelligence (AI210)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14

Course Content
The Course is for working in evolutionary and swarm computing, and engineering design, as well as search and optimization in general. It introduces the design and development of a number of popular and recent swarm and evolutionary algorithms with a focus on their applications e.g., particle swarm optimization, the artificial bee colony algorithm, Spider Monkey optimization algorithm, constrained multi-objective evolutionary algorithms, and evolutionary fuzzy systems.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

AI434	Pattern Recognition				3
Prerequisites	Machine Learning (AI325)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155	Equivalent ECTS		5.14	
Course Content					
Introduction to pattern recognition, Decision functions, Classification by Distance Functions and Clustering, Classification Using Statistical Approach, Feature Selection, Syntactic Pattern Recognition.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

AI435	Smart Applications				3
Prerequisites	Introduction to Artificial Intelligence (AI210)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
This course is designed as a collection of tutorials and case studies presented by lectures. Basically, three topics will be covered. In the first field, students will discover the topic of wearable devices and wearable technologies. Afterwards, some sessions on Internet of Things applications will be considered. Finally, an overview of some other smart systems will be described.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

AI443	Artificial Intelligence for Robotics				3
Prerequisites	(Introduction to Artificial Intelligence- AI210)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
This course covers Introduction, Robotic perception – localization, mappings planning to move – configuration space, cell decomposition methods, skeletonization methods, Planning uncertain movements – Robust methods. Moring –dynamics and control, Potential Field control, reactive control, Robotics software architecture, Applications - LISP and other programming languages – Introduction to LISP, Syntax and numerical function, LISP and PROLOG distinction, input, output and local variables, interaction and recursion, property list and arrays alternative languages, formalized symbolic logics – properties of WERS, non-deductive inference methods - Expert system – Introduction, difference between expert system and conventional programs, basic activities of expert system – Interpretation, Prediction, Diagnosis, Design, Planning, Monitoring, Debugging, Repair, Instruction, Control. Basic aspects of expert system – Acquisition module, Knowledge base – Production rules, semantic net, frames. Inference engine – Backward chaining and forward chaining. Explanatory interface.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science & AI					
As minor in Program(s) Code(s)					

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)

تم المسح الضوئي بـ CamScanner

AI444	Speech Processing		3
Prerequisites	Object Oriented Programming-CS103		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14

Course Content

Speech Processing offers a practical and theoretical understanding of how human speech can be processed by computers. It covers speech recognition, speech synthesis and spoken dialog systems. The course involves practical's where the student will build working speech recognition systems, build their own synthetic voice and build a complete telephone spoken dialog system. This work will be based on existing toolkits. Details of algorithms, techniques and limitations of state-of-the-art speech systems will also be presented. This course is designed for students wishing to understand how to process real data for real applications, applying statistical and machine learning techniques as well as working with limitations in technology.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science & AI
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

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Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
%10	---	%15	%15	%10	---	%50

تم المسح الضوئي بـ CamScanner

AI445	Robot Programming		3
Prerequisites	(Artificial Intelligence-AI210)		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	155	Equivalent ECTS	5.14
Course Content			
This course cover: Robot programming-Introduction-Types- Flex Pendant- Lead through programming, Coordinate systems of Robot, Robot controller- major components, functions-Wrist Mechanism-Interpolation-Interlock Commands Operating mode of robot, Robot specifications- Motion commands, end effectors and sensors commands - Robot Languages-Classifications, Structures- VAL language commands-motion control, hand control, program control, pick and place applications, palletizing applications using VAL, Robot welding application using VAL program WAIT, SIGNAL and DELAY command for communications using simple applications - RAPID language basic commands- Motion Instructions-Pick and place operation using Industrial robot-manual mode, automatic mode, subroutine command based programming. Move master command language-Introduction, syntax, simple problems - Robot cycle time analysis Multiple robot and machine Interference-Process chart Simple Problems-Virtual robotics, Robot studio online software-Introduction, Jogging, components, work planning, program modules, input and output signals Singularities Collision Detection-Repeatability measurement of robot-Robot economics - VAL-II programming-basic commands, applications- Simple problem using conditional statements-Simple pick and place applications-Production rate calculations using robot. AML Language-General description, elements and functions, Statements, constants and variables-Program control statements - Operating systems, Motion, Sensor Commands-Data processing.			
Taught in Program(s)			
As major in Program(s) Code(s)			
Computer Science & AI			
As minor in Program(s) Code(s)			

Targeted Sustainable Development Goals			

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تم المسح الضوئي بـ CamScanner

☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS446	Programming for Problem Solving				3
Prerequisites	CS103 (Object Oriented Programming)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155	Equivalent ECTS		5.14	
Course Content					
1. Basic model of computation, Notion of Algorithms 2. Basics of functional programming 3. Iterative versus recursive 4. Correctness and efficiency issues in programming, time, and space measures 5. Basics of imperative style programming 6. Assertions and loop invariants 7. Top-down design and examples of stepwise refinement 8. Problem solving and algorithm development.					
Taught in Program(s)					
As major in Program(s) Code(s)					

As minor in Program(s) Code(s)					
Computer Science & AI					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

AI447	Embedded Systems				3
Prerequisites	CS206 (Data Structure)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14
Course Content					
An introduction to the design of embedded systems, with an emphasis on understanding the interaction between hardware, software, and the physical world. Topics covered include assembly language programming, interruptions, I/O, concurrency management, scheduling, resource management, and real-time constraints.					
Taught in Program(s)					
As major in Program(s) Code(s)					

As minor in Program(s) Code(s)					
Computer Science & AI					
Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS448	Internet of Things				3
Prerequisites	CS209 (Computer Networks)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14

Course Content
The course covers the following areas: Internet in general and Internet of Things: layers, protocols, packets, services, performance parameters of a packet network as well as applications such as web, Peer-to-peer, sensor networks, and multimedia. Transport services: TCP, UDP, socket programming. Network layer: forwarding & routing algorithms (Link, DV), IP-addresses, DNS, NAT, and routers. Local Area Networks, MAC level, link protocols such as point-to-point protocols, Ethernet, Wi-Fi 802.11, cellular Internet access, and Machine-to-machine. Mobile Networking: roaming and handoffs, mobile IP, and ad hoc and infrastructure less networks. Real-time networking: soft and real time, quality of service/information, resource reservation and scheduling, and performance measurements. IoT definitions: overview, applications, potential & challenges, and architecture. IoT examples: Case studies, e.g., sensor body-area-network and control of a smart home. Lab: performance measurements on local wireless and mobile networks

Taught in Program(s)
As major in Program(s) Code(s)

As minor in Program(s) Code(s)
Computer Science & AI

Targeted Sustainable Development Goals					
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Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)

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CS449	Natural Language Processing				3
Prerequisites	Introduction to Artificial Intelligence (AI210)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155		Equivalent ECTS		5.14

Course Content

Students will learn how to process written text from basic of fundamental knowledge starting with Finite automata, Regular expression, and probabilistic model with n-grams. Recognizing Speech and parsing with grammar. This course also covers the basis of semantic analysis and discourse analysis and drives it to machine translation. Approaches to transfer learning in NLP. This NLP course will boost student knowledge to research level where they can conduct new levels of research.
Major Components of the Course include:
Basic Text Processing: Tokenization, Stemming - Language Modeling: N-grams, smoothing.
Morphology, Parts of Speech Tagging - Syntax: PCFGs, Dependency Parsing
Topic Models - Distributional Semantics - Lexical Semantics, Word Sense Disambiguation
Information Extraction: Relation extraction - Text Classification, Sentiment Analysis
Transfer Learning for NLP: Basic and Advanced Models; Analysis.

Taught in Program(s)
As major in Program(s) Code(s)

As minor in Program(s) Code(s)
Computer Science & AI

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☒ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☒ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)

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AI450	Deep Learning				3
Prerequisites	(Machine Learning – AI325)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155	Equivalent ECTS		5.14	
Course Content					
Selected topics of Deep Learning, discussing recent models from both supervised and unsupervised learning. Special emphasis will be on convolutional architectures, invariance learning, unsupervised learning, and non-convex optimization. Course Outline: Deep learning: regularization, convolutional neural networks, recurrent neural networks, autoencoders - Deep Unsupervised Learning - Miscellaneous Topics.					
Taught in Program(s)					
As major in Program(s) Code(s)					

As minor in Program(s) Code(s)					
Computer Science & AI					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☒ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☒ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

AI451	Intelligent Agents based Systems				3
Prerequisites	Object Oriented Programming (CS103)				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155	Equivalent ECTS		5.14	
Course Content					
Definitions of agents, distributed AI and agents, intelligent agents, multi-agent systems, cooperation, agent application areas; Reasoning: multi-agent epistemic logic, action logics, deliberation, BDI models; Competitive models: strategies and equilibria, opponent modelling; Cooperative models: bargaining and negotiation, resource allocation, inter-agent relationships; Open Issues: development methodology, programming languages, standards.					
Taught in Program(s)					
As major in Program(s) Code(s)					

As minor in Program(s) Code(s)					
Computer Science & AI					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☒ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☒ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

CS452	New trends in Computer Science				3
Prerequisites	---				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155	Equivalent ECTS	5.14		
Course Content					
This course aims to introduce students to novel topics in Computer Science that need to be identified in a responsive manner as technology and its use evolve and develop. This course is essentially a flexibility enhancing will be filled on a year-by year basis.					
Taught in Program(s)					
As major in Program(s) Code(s)					

As minor in Program(s) Code(s)					
Computer Science & AI					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☒ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☒ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

تم المسح الضوئي بـ CamScanner

AI453	New trends in Artificial Intelligence				3
Prerequisites	---				
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		-		2	
Required SWL	155	Equivalent ECTS	5.14		
Course Content					
This course aims to introduce students to novel topics in Artificial Intelligence that need to be identified in a responsive manner as technology and its use evolve and develop. This course is essentially a flexibility enhancing will be filled on a year-by-year basis.					
Taught in Program(s)					
As major in Program(s) Code(s)					

As minor in Program(s) Code(s)					
Computer Science & AI					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
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☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☒ GOAL 16: Peace and Justice Strong Institutions	☒ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
10	15		15	10	50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

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سلطان نموذج التقدم
سلطان

Computer Science & Artificial Intelligence Program

- Proposed Program Curriculum

General Program Information	
Program Name	Computer Science and Artificial Intelligence
Degree Level	Bachelor of Artificial Intelligence Science Specialist (Applied Artificial Intelligence)
Interdisciplinary program (if yes, specify disciplines)	No ☒ Disciplines: -----
Faculty/ Faculties	Higher Inst. For Computers and Business
Academic Department (S)	one
Program Type (collaborative, joint, or single institution):	Single
Number of Credit Hours required	140
Method of Delivery (online/ face-to-face/ hybrid)	face-to-face
Institutional Board Approval Date	

A. Overview

Applied Artificial Intelligence (AI) programs focus on the practical deployment of AI methodologies to solve real-world problems across diverse domains such as business, healthcare, manufacturing, finance, and transportation. These programs emphasize the development, implementation, and evaluation of AI-driven solutions that enhance operational efficiency, automate complex tasks, and support intelligent decision-making.

Core areas of study include machine learning, deep learning, natural language processing, computer vision, robotics, data mining, AI ethics, and human-AI interaction. Students are also introduced to domain-specific applications such as intelligent recommendation systems, predictive analytics, autonomous systems, and AI-enabled process optimization.

The primary goals are to prepare students to design scalable AI systems, evaluate their performance, and apply them effectively within specific industry contexts. The rationale behind this field lies in the growing demand for AI-powered solutions that can adapt to complex, data-rich environments and the need for professionals who can translate theoretical AI concepts into impactful technological applications.

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Students **gain expertise** in algorithm development, programming for AI (e.g., using Python and relevant libraries), data handling and preprocessing, model training and validation, and deploying AI models in production environments. Applied AI is inherently interdisciplinary, drawing from computer science, statistics, cognitive science, and domain knowledge, enabling graduates to become leaders in the design and execution of AI initiatives that drive innovation and strategic advantage across sectors.

1. Describe how the new program is consistent with the mission and goals of the institution. (Provide a matrix showing relation among program aims and those of the institution).

Institutional Mission Statement

To advance knowledge and foster innovation through high-quality education, interdisciplinary research, and community engagement, preparing graduates to be ethical, competent, and socially responsible leaders in a global society.

Institutional Goals

1. **Academic Excellence** – Promote innovative, relevant, and rigorous academic programs.
2. **Research and Innovation** – Encourage cutting-edge research that addresses societal and technological challenges.
3. **Community Engagement** – Foster partnerships with industry, government, and society to contribute to economic and social development.
4. **Global Competence** – Prepare students for leadership in an increasingly interconnected world.
5. **Ethical and Social Responsibility** – Instill values of integrity, accountability, and respect in academic and professional practice.

2. Describe the rationale of the program and specify related (international/regional/national) benchmarking, employability and possible jobs according to market study.

The **Applied Artificial Intelligence (AI)** program **rational** is designed in response to the global surge in demand for intelligent systems that can analyze data, learn from patterns, and automate complex tasks. As organizations increasingly adopt AI to enhance decision-making, productivity, and innovation, there is a critical need for professionals equipped with both theoretical knowledge and practical skills to implement AI solutions across various industries.

This program aims to bridge the gap between academic AI research and real-world applications by providing students with a solid foundation in core AI technologies, including machine learning, deep learning, computer

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vision, natural language processing, and robotics—while emphasizing ethical, responsible, and domain-specific implementation.

Benchmarked against leading international, regional, and national frameworks to ensure academic quality, industry relevance, and global competitiveness. At the international level, the curriculum aligns with the IEEE/ACM guidelines for Artificial Intelligence education, as well as UNESCO's AI competency framework, ensuring that graduates possess globally recognized skills in machine learning, data ethics, and intelligent systems. Regionally, the program reflects priorities set by strategic initiatives such as the European Union's Digital Education Action Plan and Gulf Cooperation Council (GCC) AI strategies, which emphasize the integration of AI in key sectors like smart cities, healthcare, and energy. Nationally, the program adheres to the country's higher education qualification frameworks and national AI strategies, which call for the development of a digitally skilled workforce to support innovation and economic diversification. This multi-level benchmarking guarantees that the program remains current, robust, and aligned with the evolving demands of the global AI landscape.

Employability

Graduates of the Applied Artificial Intelligence program benefit from strong employability prospects due to the rapid expansion of AI technologies across multiple sectors. The program provides students with hands-on experience in designing, developing, and deploying AI systems, ensuring they are workforce-ready upon graduation. Skills gained in machine learning, data analysis, programming, and ethical AI use are highly transferable and in demand. The interdisciplinary nature of the program also enhances graduates' adaptability, allowing them to work in diverse environments such as startups, multinational corporations, research institutions, and government agencies. Employers value the program's focus on real-world application, critical thinking, and collaborative problem-solving, all of which contribute to graduates' competitiveness in the job market.

Possible Jobs

The Applied AI program prepares students for a range of specialized roles that are increasingly central to today's digital economy. Possible job titles include **AI Engineer**, **Machine Learning Engineer**, **Data Scientist**, **NLP Developer**, **Computer Vision Engineer**, and **AI Software Developer**. Additionally, emerging roles such as **AI Product Manager**, **AI Research Associate**, **Robotics Engineer**, and **AI Ethics Officer** reflect the broad scope of AI applications and the need for professionals who understand both the technical and societal implications of AI systems. These roles are in high demand across industries such as healthcare, finance, transportation, retail, energy, education, and cybersecurity, providing graduates with diverse and rewarding career pathways.

B. Program Quality and Student Success

The curriculum should be structured to meet the stated objectives and student learning outcomes of the program.

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3. Provide program aims (objectives) and specific learning outcomes.

The Applied AI program aims to produce graduates who are capable of designing, developing, and applying intelligent systems to address real-world challenges across diverse domains. The program is structured to blend theoretical foundations with practical skills while promoting ethical and socially responsible AI innovation.

Program Aims:

1. **Develop Technical Proficiency in AI**
   Equip students with strong foundational knowledge and practical skills in artificial intelligence, including machine learning, deep learning, natural language processing, computer vision, and robotics.
2. **Promote Real-World Application of AI**
   Enable students to apply AI tools and techniques to solve complex, domain-specific problems in sectors such as healthcare, finance, manufacturing, transportation, and education.
3. **Encourage Innovation and Research**
   Foster critical thinking and creativity to drive research, innovation, and entrepreneurship in AI technologies.
4. **Cultivate Ethical and Responsible AI Use**
   Promote awareness of ethical, legal, and societal implications of AI, ensuring graduates can develop transparent, fair, and accountable AI systems.
5. **Prepare for Interdisciplinary Collaboration**
   Train students to work effectively in multidisciplinary teams, integrating AI with other domains like data science, software engineering, and domain-specific knowledge.
6. **Support Lifelong Learning and Professional Growth**
   Instill a mindset of continuous learning and adaptability to keep pace with the rapidly evolving AI landscape and emerging technologies.

Specific Learning Outcomes

Upon successful completion of the Applied AI program, graduates will be able to:

1. **Demonstrate AI Technical Competency**
   - Explain and apply key concepts in AI, including supervised and unsupervised learning, neural networks, reinforcement learning, and AI-driven decision systems.
   - Use programming languages and tools such as Python, TensorFlow, PyTorch, and scikit-learn to develop AI models.
2. **Design and Implement AI Systems**
   - Analyze real-world problems and design appropriate AI-based solutions.
   - Build, train, evaluate, and deploy AI models to solve industry-relevant problems effectively.

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3. **Utilize Data Effectively**
    - Preprocess and analyze large datasets for AI applications.
    - Employ statistical and data visualization techniques to gain insights and inform AI modeling.
4. **Apply AI in Domain-Specific Contexts**
    - Implement AI solutions in fields such as healthcare, smart cities, autonomous systems, finance, and natural language applications.
    - Integrate AI systems with existing workflows and technologies to enhance operational efficiency.
5. **Address Ethical and Legal Issues in AI**
    - Identify and evaluate ethical, legal, and societal issues related to AI deployment (e.g., bias, transparency, privacy).
    - Design AI systems with considerations for fairness, accountability, and inclusivity.
6. **Communicate and Collaborate Effectively**
    - Present AI solutions clearly to both technical and non-technical audiences.
    - Collaborate with interdisciplinary teams to develop AI projects, considering both technical and contextual factors.
7. **Engage in Research and Innovation**
    - Formulate research questions and apply scientific methods to explore and evaluate AI solutions.
    - Contribute to academic and industry research through innovation and experimentation.
8. **Demonstrate Professionalism and Lifelong Learning**
    - Stay current with AI trends, tools, and best practices through self-directed learning and professional development.
    - Apply project management and leadership skills in AI projects and professional settings.

Skills and Abilities

- **AI Development and Implementation:**
    - Build and optimize AI models for classification, prediction, clustering, and generation tasks.
    - Deploy AI systems using platforms such as cloud computing (AWS, Azure), edge devices, and APIs.
- **Data Management and Analysis:**
    - Collect, manage, and process large structured and unstructured datasets.
    - Use tools such as Python (pandas, NumPy), SQL, and data visualization libraries (e.g., Matplotlib, Seaborn) to extract actionable insights.
- **Software Engineering and System Integration:**

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- Apply software development best practices (version control, testing, debugging) in AI system development.
- Integrate AI components into larger software architectures using REST APIs, microservices, or embedded systems.

- **Problem-Solving and Innovation:**
  - Tackle complex challenges using AI strategies, from prototype design to scalable deployment.
  - Critically assess emerging technologies and their potential impact on various industries.
- **Communication and Collaboration:**
  - Translate complex AI concepts into actionable business or policy recommendations.
  - Work effectively in diverse teams, engaging with stakeholders from both technical and non-technical backgrounds.
- **Professionalism and Ethics:**
  - Uphold ethical standards in AI development and usage, including fairness, transparency, and accountability.
  - Respect data privacy laws and guidelines while handling sensitive or personal information.
  - Commit to continuous learning through certifications, research, or industry engagement.

4. Specify the program's competitive advantages.

The Applied Artificial Intelligence program is uniquely positioned to meet both the current and future demands of the global digital economy. Its competitive advantages lie in its interdisciplinary design, practical focus, ethical foundation, and alignment with industry and national development priorities. Below are the key competitive advantages:

1. Industry-Relevant Curriculum

It focuses on high-demand areas such as machine learning, deep learning, natural language processing, computer vision, robotics, and AI ethics. Incorporates domain-specific AI applications (e.g., AI in healthcare, finance, logistics, and smart cities), ensuring relevance across sectors.

2. Hands-On, Project-Based Learning

Emphasis on real-world projects, labs, and case studies that simulate industry challenges. Students gain practical experience with leading AI tools and platforms such as Python, TensorFlow, and cloud-based deployment tools (e.g., AWS, Azure AI). Capstone projects and internships offer students the opportunity to work on live AI applications with industry partners.

3. Strong Emphasis on Ethical and Responsible AI

Unlike many technical programs, this curriculum integrates AI ethics, governance, and legal considerations throughout all levels. Students are trained to develop fair, transparent, and accountable AI systems in alignment with global ethical standards and regional regulatory frameworks.

4. Interdisciplinary and Collaborative Approach

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Encourages collaboration across disciplines, combining computer science with business, healthcare, engineering, and the social sciences. Prepares students to work in diverse teams and communicate effectively with both technical and non-technical stakeholders.

5. High Employability and Market Alignment

Graduates are equipped with in-demand skills that align with the job market needs in Egypt, the MENA region, and globally. The program targets emerging and future roles such as AI engineer, machine learning specialist, NLP developer, data scientist, and AI ethics officer. Closely aligned with national AI strategies and digital transformation agendas, enhancing graduates' competitiveness for both public and private sector roles.

6. Research and Innovation Focus

Encourages students to engage in applied research, contributing to innovation in AI applications. Opportunities to participate in faculty-led research, innovation labs, and national or international AI competitions and conferences.

7. Lifelong Learning and Career Growth Pathways

Prepares students not only for immediate employment but also for long-term professional growth, advanced studies, and certifications in AI. Builds foundational knowledge for pursuing postgraduate education or AI-related entrepreneurship.

5. Describe the admission and graduation requirements for the program.

Admission Requirements

To ensure that students are adequately prepared for the technical and interdisciplinary nature of the Applied AI program, the following **admission requirements** apply:

1. Academic Qualifications

- A high school diploma or equivalent (for undergraduate programs) with a strong academic record, especially in mathematics and science.
- For graduate programs: A bachelor's degree in computer science, engineering, mathematics, statistics, or a related field from an accredited institution.

2. Required Subject Proficiency

- **Strong foundation in mathematics**, particularly in algebra, calculus, and probability/statistics.
- **Basic programming knowledge** (e.g., Python, Java, or C++) is preferred for undergraduate applicants and mandatory for graduate applicants.

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3. Minimum Grade Requirements

- A minimum cumulative GPA (typically 2.5–3.0 on a 4.0 scale, depending on institutional policy).
- Specific subject area requirements (e.g., minimum grades in mathematics or computer science) may be enforced.

4. Language Proficiency

- Proof of English proficiency for non-native English speakers through standardized tests:
  - TOEFL (e.g., iBT 80+), IELTS (e.g., 6.0+), or equivalent.

5. Additional Requirements (if applicable)

- Statement of purpose or personal essay highlighting interest in AI and career goals.
- Letters of recommendation (typically for graduate programs).
- Interview or entrance exam (may be required by some institutions).

graduation requirements for the program:

The student must successfully complete a total of **140 credit hours**, including the requirements of **university, basic sciences, college, and specialization** courses, with a **minimum passing grade of 60%** in each course. The student must also achieve a **cumulative grade point average (CGPA) of no less than 1.0**. The duration of study must not be **less than three academic years**, in accordance with the academic regulations of the institution.

6. Provide the following information for the program and for each track, concentration, or specialization (some categories may not apply to all programs).

A guided elective is any elective that is part of a major. A free elective is an elective from any academic area not required for a major or minor.

Program/Track, Concentration, or Specialization	Total number of hours required for degree	Number of hours in degree program core	Number of hours in track	Number of hours in guided electives	Number of hours in free electives
	140	57	140		

7. Will this program replace or enhance any existing program(s) or tracks, concentrations, or specializations within an existing program? If yes, please explain.
Yes ☐ No ☒

8. How will the program support or be supported by other programs and/or units within the institution? Please also describe potential for collaboration with other programs within the institution.

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Support for Other Programs

- **Computer Science and Information Technology:**
  The AI program will offer elective courses, shared faculty expertise, and collaborative research opportunities in machine learning, data science, and software development.
- **Engineering (e.g., Electrical, Mechanical, Mechatronics):**
  AI techniques will support control systems, robotics, automation, and smart manufacturing, providing students in engineering disciplines access to applied AI tools and joint project opportunities.
- **Business and Management:**
  AI applications in business analytics, customer intelligence, financial forecasting, and operational optimization can enhance business curricula and provide joint course offerings or projects.
- **Health and Life Sciences:**
  Collaboration in areas such as medical imaging, diagnostics, genomics, and AI for public health will support informatics and biomedical research efforts.
- **Media and Communication:**
  AI's role in content generation, recommendation systems, sentiment analysis, and virtual assistants will complement programs in digital media and communication studies.

2. Support from Other Programs

- **Mathematics and Statistics Departments:**
  Will provide foundational training in linear algebra, probability, and statistical modeling essential for AI algorithm development and data interpretation.
- **Humanities and Social Sciences:**
  Courses and expertise in ethics, philosophy, and sociology will enrich the program's focus on responsible and ethical AI development.
- **Language and Linguistics Programs:**
  Will support AI specialization tracks in Natural Language Processing (NLP), including speech recognition and machine translation.

C. Feasibility

To evaluate the feasibility of the Applied Artificial Intelligence program, it is essential to assess the **required resources** and identify **potential funding sources**. This evaluation ensures the **efficient utilization of institutional resources** and helps determine the program's **financial sustainability** and **impact on the overall budget** of the institution. Key feasibility considerations include faculty and staff needs, laboratory and technical infrastructure, software and licensing requirements, classroom space, and support services. Additionally, potential funding sources such as government support, institutional budget allocations, industry partnerships, and research grants must be explored to ensure the successful launch and continuity of the program.

9. Provide estimated student enrollment for the (four) years of the program showing evidence.

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Estimating student enrollment for the Applied Artificial Intelligence (AI) program over the next four years involves considering current trends in AI education, regional demand, and institutional capacity. Considering these trends and the growing interest in AI fields, the following estimated enrollment figures for the Applied AI program are proposed:

Academic Year	Student Number
2025/2026	150
2026/2027	300
2027/2028	450
2028/2029	600

10. Will this program require additional resources or/and impact existing programs and/or organizational units within your institution? If yes, please explain.
Yes ☐ No ☒

By intelligently leveraging the existing specialized labs at Damietta University, the launch of the medical informatics program can be accelerated.

☐المراجـــــع

1. الإطار المرجعي الاسترشادي للتعليم العالى فى جمهورية مصر العربية.
2. الإطار المرجعي الاسترشادي لقطاع علوم الحاسب والمعلوماتية.

ECTS = 3 * (60 * 4 level) / 140 = 5.14

ECTS = 2 * (60 * 4 Level) / 140 = 3.43

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