



## **DeCAIR Course Syllabus Form**

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Activity Number & Title	Activity 6.1: Designing and developing syllabi and content for the agreed upon courses in the new programs			
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#### **Revision History**

Version	Date	Author	Description	Action *	Page(s)
1	11/4/2021	Ramzi Saifan	Original (base) document	С	1-5
2	9/12/2021	Ramzi Saifan	Update based on 27/11/2021 meeting	U	1-4
3	19/1/2022	Ramzi Saifan	Update based on the surveys feedback	U	1-4
4					

<sup>(\*)</sup> Action: C = Creation, I = Insert, U = Update, R = Replace, D = Delete

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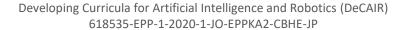
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Course title	Data S	Science				
Course number	0917546					
Credit hours (lecture and lab)	3 (3 + 0)					
ECTS (weekly contact and self-study load)	6 (3 +	6 (3 + 3)				
Prerequisites/co-requisites by course number and name	Al and	Al and machine learning, 0917451				
Prerequisites by topic (other than the formal prerequisites above)	Students are assumed to have good background in mathematics, particularly, calculus, linear algebra, and statistics. Additionally, the students should have good programming skills using Python.					
Level and type (compulsory, elective)	Bache	lor's elective course				
Year of study and semester	Fifth y	rear				
Catalogue description	Definitions and applications; Market trends; Data analytics lifecycle; Data exploration and preprocessing; Data visualization; Theory, tools and methods; Introduction to Big data management, warehousing and processing. This course has practical assignments.					
Objectives	<ol> <li>Introduce students to the practical techniques used in data analytics including loading, cleaning, preparation, wrangling, visualization, and analysis.</li> <li>Introduce students to the basic concepts and techniques in big data.</li> </ol>					
Intended learning outcomes	Upon	successful completion of this course, students will be abl	e to:			
	No	Intended learning Outcome (ILO)	Program learning outcome (PLO)*			
	1	Use Python and its specialized libraries to gain insight from data and solve problems.	1			
	2	Know the main concepts and techniques used in handling big data and performing data analytics.  (*) The PLOs are listed in the appendix	7			
Teaching and learning methods	Development of ILOs is promoted through the following teaching and learning methods:					
	•	Lectures will be in class.  The AI lab is open for the students to practice the practice solve the programming homework assignments.  The student attends the class presentations and particle discussions.  The student joins the related online team/group and prediscussions.	ipates in the			







	<ul> <li>The student studies the reference material, including books and videos.</li> <li>The student solves the programming assignments in data science.</li> <li>The student carries out a term project for solving a problem using data science techniques.</li> <li>The student develops a professional report for the term report.</li> <li>The student presents the term project in class.</li> </ul>					
Learning material type		Textbook, class handouts, some instructor keynotes, selected YouTube videos, and access to a personal computer and the internet.				
Resources and references	A- Requir	red book(s), assigned re	ading ar	d audio-visuals:		
	1. 2. 3.	Wes McKinney, Pyth NumPy, and Ipython Arshdeep Bahga and Approach, 2019. Course web page at:	ı, O'Reill <sup>ı</sup> l Vijay M	y Media, 2nd Edition	, 2018.	
	B- Recon	nmended book(s), mate	rial and	media:		
	<ol> <li>Jake VanderPlas, A Whirlwind Tour of Python, O'Reilly Media, 2016.</li> <li>Joel Gurs, Data Science from Scratch, O'Reilly Media, 2015.</li> <li>Aurélien Géron, Hands-On Machine Learning with Scikit-Learn, Keras and TensorFlow: Concepts: Tools, and Techniques to Build Intelligent Systems, 2nd Edition, O'Reilly Media, Oct 2019.</li> </ol>					
Topic outline and schedule						
	Week		Topic		ILO	Resources
	1	Course Introduction			1	
	2+3	Pandas Data Structure & Descriptive Statistic		tial Functionality	1	1
	4	Plotting and Visualizat Seaborn		Matplotlib and	1	1
	5+6	Data Loading, Storage	and File	Formats	1	1
	7+8	Data Cleaning and Pre	paration	1	1	1
	9	Data Wrangling: Join,		•	1	1
	10	Data Aggregation and	Group C	perations	1	1
	11	Time Series			1	1
	12	Introduction to Big Da			2	2
	13	Big Data Architectures	and Pat	terns	2	2
	14	MapReduce Patterns			2	2
	15	Machine Learning App	olication	s in Data Analytics	1+2	1
Evaluation tools	Opportunities to demonstrate achievement of the ILOs are provided through the following assessment tools:					
İ		Assessment tool	Mark	Topic(s)		Time
		ork assignments	20%	Programming aspe	cts	W2-W14 W8



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	Final exam	50%	All material	W16
	Total	100%		
Student requirements	The student should have a com	puter an	d internet connection.	
Course policies	A- Attendance policies:			
	<ul> <li>Attendance is required university polices will be</li> </ul>		endance will be taken every ed in this regard.	class and the
	B- Absences from exams and no	ot submit	ting assignments on time:	
	causes.	late, but		
	<ul> <li>C- Health and safety procedures:</li> <li>All health and safety procedures of the university and the school s followed.</li> </ul>			
	D- Honesty policy regarding cheating, plagiarism, misbehavior:			
	<ul> <li>Open-book exams</li> <li>All submitted work must</li> <li>Other text or code must</li> <li>specification.</li> <li>Cheating will not be tole</li> </ul>	t be prop	ne submitting student. Perly quoted with clear sourc	e
	E- Available university services that support achievement in the course:			se:
	<ul> <li>Microsoft Teams team</li> <li>Al Lab for practicing the assignments.</li> <li>Program announcement</li> </ul>	e practica	ll aspects and solving the pro	gramming
Additional information	None			





### **Appendix**

### **Learning Outcomes for the BSc in Computer Engineering**

### Students who successfully complete the BSc in Computer Engineering will be able to:

[1]	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
[2]	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
[3]	an ability to communicate effectively with a range of audiences
[4]	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
[5]	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
[6]	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
[7]	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies