Course	**BIF524/CSC463 – Data Mining**
Semester	Fall 2023
Class Time	TR 12:30–1:45pm
Location	Zakhem Hall 0503
Instructor	Dr. Eileen Marie Hanna
Credits Hours	3

INSTRUCTOR
Email: eileenmarie.hanna@lau.edu.lb
Webex Personal Room: https://lau.webex.com/meet/eileenmarie.hanna
Office: Block A, 711 – K
Office Hours: MW 3:00–5:00pm, T 3:30–5:30pm, and by appointment

CURRENT CATALOG DESCRIPTION
This course covers the fundamental techniques and applications for mining data. Topics include concepts from machine learning, information retrieval and statistics, techniques and algorithms for parametric and non-parametric classification, clustering, association rules, generalized linear models, classifier assessment, expert systems and graphical models.

PREREQUISITE/CO-REQUISITE
Senior Standing

COURSE TYPE
    Required   ☒   **E**lective   ☐   **S**elective **E**lective   ☐

COURSE LEARNING OUTCOMES
At the completion of this course, students will be able to:
1. Use visualization techniques and descriptive statistics to explore data
2. Apply different clustering, parametric and non-parametric classification techniques
3. Perform linear and quadratic discriminant analysis
4. Identify association rules and build association trees
5. Build and assess generalized linear models, neural networks and support vector machines
6. Use graphical models and expert systems to induce information from data

TEXTBOOK
An Introduction to Statistical Learning Seventh Edition 2017. Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani. Springer.
http://faculty.marshall.usc.edu/gareth-james/ISL/ISLR%20Seventh%20Printing.pdf

TOPICS COVERED IN THE COURSE
1. Introduction: useful properties of data mining algorithms, missing values, notations.
2. Exploratory data analysis with introduction to R
3. Linear Regression
4. Classification: Theoretical background and discriminant analysis
5. Resampling Methods Classifier assessment
6. Model Selection and Regularization
7. Trees Based Methods and Association Rules
8. Support Vector Machines
9. Unsupervised Learning & Clustering

TEACHING/LEARNING METHOD
Lectures, discussions, practical sessions, literature review, and project development.

COURSE GRADING AND PERFORMANCE CRITERIA (SUBJECT TO 5% VARIATION)
Midterm 35%, Project 30%, and Final Exam 35%

POLICY ON CHEATING AND PLAGIARISM
Students caught cheating on an exam receive a grade of zero on the exam in their first cheating attempt and receive a warning. Students caught cheating for the second time in the same course will receive a grade of "F" in the course and a second warning.

Plagiarism on assignments and project work is a serious offense. If plagiarism is detected, a student will be subject to penalty, similar to the cheating case, which ranges from receiving a zero on the assignment concerned to an "F" in the course in addition to a warning.

UNIVERSITY ATTENDANCE POLICY
- Students are expected to attend all classes.
- For valid reasons, students may miss classes for a maximum that is equivalent to two regular weeks.
- When exceeding the maximum number of absences, it is the instructor's prerogative to ask the concerned student to stop attending and drop the course. In this case, it is the student's responsibility to drop the course; otherwise a grade of "F" or "NP" will be given.
- In exceptional justified cases (long illness, etc.), where absences exceed the maximum, the student has to petition to the department Chair to be allowed to stay in the course.
- Students are held responsible for all the material presented in the classroom, even during their absence

WITHDRAWAL POLICY
WI is equivalent to Early Withdrawal

WP is equivalent to Withdrawal/Pass

WF is equivalent to Withdrawal/Fail

1. A student who withdraws after the Drop/Add period and by the end of the 5th week of classes (10th day of classes for Summer Modules) will obtain a "WI" on that particular course.

The student may process such request directly through the Registrar's Office.

2. A student who withdraws from a course between the 6th week and the end of the 10th week of classes (18th day of classes for Summer Modules) will receive either a "WP" or a "WF". "WP" or "WF" will be determined by the instructor based on the achieved academic performance in that course till the time of withdrawal.

3. The "WI" and the "WP" will not count as a Repeat; whereas the "WF" will count as a Repeat.

4. "WI", "WP" and "WF" will not count towards the GPA calculation.

Deadline for the "WP" and "WF" withdrawal from courses: check university calendar (It is the student's responsibility to drop the course)

COURSE ONLINE EVALUATIONS
Completion of the online course evaluations is important for feedback and improvement. Students are highly encouraged to complete the course evaluations at the end of the semester.

TIPS FOR SUCCESS
- Study regularly
- Ask questions
- Actively participate in class
- Do not wait until the last minute to work on assignments or study for exams
- Keep up with homework and course activities
- Communicate with me if you have any questions/difficulties/challenges

ADDITIONAL REMARKS
- Make-ups and Incomplete: students are not automatically entitled to make-ups; F will be given until reasons (in writing and within one week of absence) are presented and approved.

- Some of the exam questions will be based on class discussion and assignments.
- No mobile phones in the classroom.

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ASSESSMENT PLAN FOR THE COURSE
Embedded (project assignments and exams)

Student Code of Conduct - Academic Violations

The following table defines the sanction(s) associated with each violation. In some cases, and when the violation is too general, a range of sanctions is set for the pertinent committee to choose from depending on the specifics of each case. As for the second offense, the set sanctions apply regardless whether the violation has taken place in the same course or a different one, within the same semester or not.

Code #	Violation	First Offense	Second Offense
Cheating			
2.2.1	Using material or equipment (including mobile phones, electronic tablets, i-pads, calculators, and other devices) that is not authorized by the instructor in an examination, project, or graded assignment	zero on the deliverable with a warning	F on the course with a warning
2.2.2	Cheating, copying, collaborating with or aiding another Student in a manner not permitted by the instructor on an examination, project, or other graded assignment	zero on the deliverable with a warning	suspension
2.2.3	Distributing or aiding in the distribution of previous exams without authorization of the instructor	double warning – suspension	suspension – expulsion
2.2.4	Stealing, reproducing, or circulating an examination or other graded assignment before it has been administered	suspension	expulsion
2.2.5	Impersonating another Student or allowing another Student to impersonate one's self during an examination, presentation, or other graded assignment	suspension for both	expulsion
2.2.6	Impersonating an assistant, staff member, or faculty member for the purpose of (a) proctoring examinations without authorization or permission or (b) obtaining confidential information regarding coursework or examinations	suspension – expulsion	expulsion
2.2.7	Receiving, purchasing or selling a project, paper, or any academic document and presenting it as work other than that of the author	suspension – expulsion	expulsion
2.2.8	Submitting identical papers or coursework for credit in more than one class without the permission of the instructor	zero on the deliverable with a warning	F on the course with a warning
Plagiarism and Copyright Violations			
2.2.9	Failing to attribute language or ideas to their original source by not crediting the original author with an appropriate acknowledgement or citation	zero on the deliverable with a warning	F on the course with a warning
2.2.10	Using photocopied or electronic copies of textbooks, compact disks, films, music, online course materials, and other content beyond the fair use policy within University Premises	warning	double warning
2.2.11	Using copyrighted materials, including in written	warning	double

Code #	Violation	First Offense	Second Offense
	research reports and papers, without obtaining required permission, if any, from the rights holder		warning
Unauthorized Sale, Distribution, or Use of Course Materials			
2.2.12	Recording any lecture or presentation for personal use or public distribution without the prior consent of the course instructor. This applies to the unauthorized use of any medium including but not limited to mobile phones, electronic tablets, i-pads recorders, films, and other devices	warning	double warning
2.2.13	Selling academic materials by any Student, club, or group. This includes but is not limited to lectures, course recordings, class notes, and previous exams	warning	double warning