IS6941: MACHINE LEARNING AND SOCIAL MEDIA ANALYTICS

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Machine Learning and Social Media Analytics

Subject Code
IS - Information Systems
Course Number
6941

Academic Unit
Information Systems (IS)

College/School
College of Business (CB)

Course Duration
One Semester

Credit Units
3

Level
P5, P6 - Postgraduate Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

This course aims to develop students' knowledge and skills to apply machine learning and social media analytics tools and techniques to enhance various business applications.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the basic concepts and techniques for machine learning and social media analytics.	20	x	x	
2	Design and apply machine learning and social media analytics tools and techniques to enhance various business applications.	30	x	x	x
3	Critically evaluate various machine learning and social media analytics technologies with respect to realistic business contexts.	30		x	x
4	Work productively as part of a team, and in particular, communicate and present analytics solutions effectively in written and oral forms under a collaborative work environment.	20	x	x	

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	1: Lecture	Students will learn the concepts and general knowledge of machine learning and social media analytics tools, techniques, and their business applications. - In-class discussion: Students actively participate in discussions in lectures (e.g. face-to-face discussion, using mobile devices) and the lecturer provides feedback based on students' responses. - Active Reflection: At the beginning of every lecture, students are expected to actively reflect and summarize the main topics covered in the previous lecture and lecturer will provide feedback based on students' concerns and questions.	1, 2, 3	

2	2: Tutorial, Laboratory and Case studies	Students will apply the technical aspects of various machine learning and social media analytics tools and techniques, and their real-world applications in the tutorial and laboratory sessions. - Tutorial exercises: e.g. hands-on activities of utilizing lexicon and machine learning based social sentiment analysis; hands-on activities of applying large-scale social network analysis software such as Pajek for social media analytics; hands-on activities of applying various Python-based APIs for online social media data management and analytics, etc. - Case/Group project discussion: Students will be given some case studies and a project relating to machine learning-based analytics or social media analytics application under a realistic business context. Discussion on various aspects of a case or project for applying machine learning and social media analytics tools to improve the productivity and efficacy of a business application will be conducted.	1, 2, 3, 4	
3	3: On-Line Active Readings and Discussions	Students are encouraged to conduct self-reflection and sharing of concepts, techniques, and methods related to machine learning and social medial analytics methodologies, and their applications to real-world business contexts.	1, 2, 4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	AT1: Individual Tutorial Exercises Students need to complete and submit individual tutorial exercises that cover both conceptual exploration and hands-on skills of machine learning and social media analytics tools and techniques.	1, 2	10	-	Yes
2	AT2: Team Project There will be a team project associated with the course. The assessment of the team project is based on the understanding of the concepts and techniques related to machine learning and social media analytics discussed in lectures, and the creativities of applying these tools and techniques to solve a real-world business problem. The project requires a project proposal, prototype system demonstration, and presentation, as well as a final report.	1, 2, 3, 4	40	-	No

3	AT3: Individual Online Reflection and Discussion Exercises Students need to complete and submit individual self-reflection and collaborative discussion reports related to case studies of applying machine learning and social media analytics solutions to enhance various business applications.	3, 4	10	-	Yes
4	AT4: Individual Test The individual test will be used to assess students' achievement on various intended learning outcomes.	1, 2, 3	40	-	No

Continuous Assessment (%)

100

Minimum Continuous Assessment Passing Requirement (%)

40

Assessment Rubrics (AR)

Assessment Task

AT1: Individual Tutorial Exercises (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Capability to describe the basic concepts and techniques for machine learning and online social media analytics.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT1: Individual Tutorial Exercises (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to design and apply machine learning and social media analytics tools and techniques to enhance various business applications.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT2: Team Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to describe the basic concepts and techniques for machine learning and social media analytics.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT2: Team Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to design and apply machine learning and social media analytics tools and techniques to enhance various business applications.

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(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
AT2: Team Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Ability to critically evaluate various machine learning and social media analytics technologies with respect to realistic business context.

Excellent
(A+, A, A-) High

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(D) Basic

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(F) Not even reaching marginal levels

Assessment Task
AT2: Team Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Ability to work productively as part of a team, and in particular, communicate and present machine learning and social media analytics solutions effectively in written and oral forms under a collaborative work environment.

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT3: Individual Online Reflection and Discussion Exercises (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to critically evaluate various machine learning and social media analytics technologies with respect to realistic business context.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT3: Individual Online Reflection and Discussion Exercises (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to work productively as part of a team, and in particular, communicate and present machine learning and social media analytics solutions effectively in written and oral forms under a collaborative work environment.

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(A+, A, A-) High

Good

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(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task
AT4: Individual Test (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Ability to describe the basic concepts and techniques for machine learning and online social media analytics.

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
AT4: Individual Test (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Ability to design and apply machine learning and social media analytics tools and techniques to enhance various business applications.

Excellent
(A+, A, A-) High

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AT4: Individual Test (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Ability to work productively as part of a team, and in particular, communicate and present machine learning and social media analytics solutions effectively in written and oral forms under a collaborative work environment.

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(A+, A, A-) High

Good
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(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
AT1: Individual Tutorial Exercises (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
Capability to describe the basic concepts and techniques for machine learning and online social media analytics.

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate

Failure
(F) Not even reaching marginal levels

Assessment Task
AT1: Individual Tutorial Exercises (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
Ability to design and apply machine learning and social media analytics tools and techniques to enhance various business applications.

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Assessment Task
AT2: Team Project (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
Ability to describe the basic concepts and techniques for machine learning and social media analytics.

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AT2: Team Project (for students admitted from Semester A 2022/23 to Summer Term 2024)

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Ability to critically evaluate various machine learning and social media analytics technologies with respect to realistic business context.

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Failure
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Assessment Task
AT3: Individual Online Reflection and Discussion Exercises (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Ability to critically evaluate various machine learning and social media analytics technologies with respect to realistic business context.

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(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Moderate

Failure

(F) Not even reaching marginal levels

Assessment Task

AT3: Individual Online Reflection and Discussion Exercises (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

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Assessment Task

AT4: Individual Test (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Ability to describe the basic concepts and techniques for machine learning and online social media analytics.

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(B-, C+, C) Moderate

Failure
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Assessment Task
AT4: Individual Test (for students admitted from Semester A 2022/23 to Summer Term 2024)

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Part III Other Information

Keyword Syllabus

- Online social media services (e.g. YouTube, Twitter, Facebook, GitHub, etc.) and their APIs.
- Social media analytics tools. Analytics development tools such as Python and social network analytics tools such as Pajek.
- Scraping and extracting conversational topics on Internet forums using Python.
- Analyzing social media contents (e.g. tweets) using sentiment analysis and entity recognition tools.
- Classical machine learning techniques for social media analytics such as Naïve Bayes classification for social link prediction, the K-Nearest Neighbour (KNN) method for social sentiment analysis, Multilayer Perceptron for social sentiment analysis, Decision Trees and Random Forests for social emotion classification, etc.
- Unsupervised machine learning (e.g., fuzzy c-means clustering) for social text clustering, application of conceptual clustering techniques such as Latent Dirichlet Allocation (LDA) to social text analysis.
- Deep learning for multimodal social media content analysis. Convolutional Neural Networks (CNNs) for social image analysis. TextCNNs for social media text analysis. Pre-trained BERT for social media text analysis.

Reading List

Compulsory Readings

	Title
1	Aurélien Géron. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems, O'Reilly Media; 2nd Edition (October 15, 2019), ISBN: 978-1492032649.
2	Chatterjee, Siddhartha and Krystyanczuk, Michal. Python Social Media Analytics: Analyze and visualize data from Twitter, YouTube, GitHub, and more (1st edition), Packt Publishing (2017), ISBN: 978-1-78712-148-5.

Additional Readings

	Title
1	Stephen Klosterman. Data Science Projects with Python: A case study approach to successful data science projects using Python, pandas, and scikit-learn, Packt Publishing (2019), ISBN: 978-1838551025..
2	Nataraj Dasgupta. Practical Big Data Analytics: Hands-on techniques to implement enterprise analytics and machine learning using Hadoop, Spark, NoSQL and R (1st edition), Parkt Publishing, 2018, ISBN: 978-1783554393.
3	Bali, R., Sarkar, D., Sharma, T. Learning Social Media Analytics with R: Transform data from social media platforms into actionable business insights (May 26, 2017), ISBN-13: 978-1787127524.
4	Christina Prell. Social Network Analysis: History, Theory and Methodology, SAGE Publications Ltd (November 24, 2011), ISBN: 978-1412947152.
5	Online Resources
6	Course reading materials will be augmented by articles from journals and by whitepapers and other materials available on-line. Below are some examples:
7	Luo, Bei, Lau, Raymond Y.K., Li, C. July 2023, Emotion-regulatory chatbots for enhancing consumer servicing: An interpersonal emotion management approach, Information and Management (60:5).

8	Yuan, Hui, Tang, Yuanyuan, Xu, Wei, Lau, Raymond Y. K. January 2021, Exploring the influence of multimodal social media data on stock performance: An empirical perspective and analysis, Internet Research (31:3), pp. 871-891.
9	Lau, Raymond Y. K., Zhang, W. & Xu, W., Oct 2018, Parallel Aspect Oriented Sentiment Analysis for Sales Forecasting with Big Data, Production and Operations Management (27:10), pp. 1775-1794.
10	Lau, Raymond Y. K., Zhao, J. L., Chen, G. & Guo, X., Dec 2016, Big Data Commerce, Information and Management (53:8), pp. 929-933.
11	Lau, Raymond Y. K., Leon Zhao, J., Zhang, W., Cai, Y. & Ngai, E. W., Jun 2015, Learning context-sensitive domain ontologies from folksonomies: A cognitively motivated, method, INFORMS Journal on Computing (27:3), pp. 561-578.
12	Du, X., Ye, Y., Lau, Raymond Y. K. & Li, Y., Apr 2015, OpinionRings: Inferring and visualizing the opinion tendency of socially connected users, Decision Support Systems (75), pp. 11-34.