Course Specification
(Postgraduate)

Course Title: DATA ANALYTICS FOR SUPPLY CHAIN

Course Code: SCM 532

Program: EXECUTIVE MASTER IN SUPPLY CHAIN MANAGEMENT

Department: MANAGEMENT

College: COLLEGE OF BUSINESS

Institution: AL YAMAMAH UNIVERSITY

Version: 1

Last Revision Date: 18/03/2025

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A. General information about the course:

1. Course Identification:

1. Credit hours: 3
(3, 0, 1)

2. Course type			
A.	☒ University	☐College	☐Department ☐Track
B.	☒ Required		☐ Elective

3. Level/year at which this course is offered: (Level 3/2nd year)

4. Course general Description:

This course will focus on how to deal with virtual flood of information flows through supply chain systems, such as enterprise resource planning and the Internet. Then, data analytics algorithms are applied to manipulate all this data, and transform it into actionable information to support decision making through all supply chain's activities. This course explores how data analytics, AI, and machine learning optimize supply chain decision-making. Students will learn how to use big data, predictive analytics, and visualization tools to enhance efficiency, reduce costs, and manage risks in global supply chains.

5. Pre-requirements for this course (if any):

N/A

6. Pre-requirements for this course (if any):

Not Applicable

7. Course Main Objective(s):

The course aims at providing students with in depth knowledge and understanding of different tools and techniques commonly used in (big) data analytics. The purpose of this course is to allow students to explore and use data analytics tools and algorithms. They will be taught how to use advanced predictive and prescriptive analytics techniques to find hidden patterns in the big data. From data mining to decision support systems, the module will offer transferable skills. Students will develop the ability to analyze and solve realistic decision problems in the context of logistics and supply chain management.

Upon successful completion of this course, students will be able to:

1. Understand data analytics in supply chains, and explain the role and significance of data analytics in supply chain management.
2. Apply analytical techniques and machine learning algorithms for supply chain analysis.
3. Enhance decision-making, and develop data-driven strategies to improve supply chain efficiency and resilience.
4. Optimize supply chain performance, and analyze demand forecasting, inventory management, and logistics using data analytics.
5. Acquire practical skills by utilizing software tools such as Python, R, and SQL.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3 hrs. per week	75%
2	Distance-Learning	0 hrs. per week	0%
3	E-learning	1 hrs. per week	25%

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	3
2.	Practical (Computer Lab with Analytical Tools)	1
3.	Field assignments	0
4.	Others (Seminars)	1
	Total (per week)	5

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Acquire knowledge about principles and algorithms of data analytics for supply chains	CLO1 Knowledge and understanding (K2)	Student-Centric: Discussion, Analysis, Abstraction, and Seminars	Mid-terms, Quizzes, and Final exam
2.0	Skills			
2.1	Apply data analytics principles in managing different aspects of supply chains	CLO2 Cognitive Skill (S2)	Student-Centric: Data Analysis, Problem solving, and Lab sessions.	Mid-terms, Quizzes, Lab exam and Final exam
2.2	Use data analytics algorithms to provide creative solutions to supply chain problems	CLO3 Communication and ICT Skills (S3)	Student-Centric: Data Analysis, Problem solving, and Lab sessions.	Mid-terms, Quizzes, Lab exam and Final exam
2.3	Use specialized software packages to manipulate big data for supply chains	CLO4 Communication and ICT Skills (S4)	Student-Centric: Data Analysis, Problem solving, and Lab sessions.	Mid-terms, Quizzes, Lab exam and Final exam
3.0	Values, autonomy, and responsibility			

C. Course Content:

No	List of Topics	Contact Hours
1	Topic 1: Introduction to data analytics in supply chains	03
2	Topic 2: Data Collection and Processing Techniques	06
3	Topic 3: Descriptive, Predictive, and Prescriptive Analytics	09
4	Topic 4: AI-driven demand forecasting tools	06
5	Topic 5: Data Visualization and Decision Support Systems	06
6	Topic 6: Case Studies and Practical Applications	09
7	Topic 1: Introduction to data analytics in supply chains	06
Total		**45**

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	4 Quizzes after Weeks 3, 6, 9 and 12	20%
2.	Mid-terms	8th Week	20%
3.	Lab Exam	13th Week onwards	20%
4.	Final exam	15th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	**Shmueli, G., Bruce, P. C., & Patel, N. R. (2018)**. *Data Mining for Business Analytics: Concepts, Techniques, and Applications in R*. Wiley Inc.. ISBN: 978-1-118-87933-7 https://www.wiley.com/en-be/search?pq=Data%20Mining%20for%20Business%20Analytics%3A%20Concepts%2C%20Techniques%2C%20and%20Applications%20in%20R <u>EMC Education Services</u> **(2015).** Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data ISBN: 978-1-118-87613-8 **https://www.wiley.com/en-us/search?pq=Data%20Science%20and%20Big%20Data%20Analytics%3A%20Discovering%2C%20Analyzing%2C%20Visualizing%20and%20Presenting%20Data**
Supportive References	**McKinney, W. (2022).** *Python for Data Analysis* (3rd ed.). O'Reilly Inc. ISBN: 9781098104030 https://www.oreilly.com/library/view/python-for-data/9781098104023/ **Montgomery, D. C., Jennings, C. L., & Kulahci, M. (2024).** *Introduction to Time Series Analysis and Forecasting*. Wiley Inc.

	ISBN: 978-1-394-18670- **https://www.wiley.com/en-be/Introduction+to+Time+Series+Analysis+and+Forecasting%2C+3rd+Edition-p-9781394186709**
Electronic Materials	Related research papers and case studies.
Other Learning Materials	**Industry Reports** **1. DHL (2023).** *Big Data & AI in Logistics: Transforming Supply Chains* https://www.dhl.com/global-en/delivered/innovation/big-data-analytics-in-supply-chain-management.html **2. McKinsey & Co. (2022).** *AI & Digital Transformation in Supply Chains* https://www.mckinsey.com/capabilities/operations/our-insights/digital-transformation-raising-supply-chain-performance-to-new-levels

2. Educational and Research Facilities and Equipment Required:

Items	Resources
Facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms and computer lab.
Technology equipment (Projector, smart board, software)	Projector, smart board, software packages of big data analytics
Other equipment (Depending on the nature of the specialty)	To be requested as per need

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect method (Course evaluation survey)
Effectiveness of students assessment	Program Leaders, Peer Reviewer	Direct and Indirect method (Course results and survey)
Quality of learning resources	Faculty and Students	Indirect method (Resources evaluation survey)
The extent to which CLOs have been achieved	Faculty and Students	Direct method (Course results) Indirect method(Course evaluation survey)
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	