Lahore University of Management Sciences
CS 486 / CS 5802 – Enterprise Resource Planning Systems
Fall 2023
Academic Session (2023-24)

Instructor	Arsalan Ijaz Anwer	Secretary/TA	Mr. Afaq Butt/ TAs to be assigned
Room No.	To be assigned	TA Office Hours	To be decided
Office Hours	To be decided	Course URL (if any)	lms.lums.edu.pk
Email		Lecture Mode	In-Person
Telephone			
First Day of Classes	Monday, September 04, 2023	Last Day of Classes	Monday, December 11, 2023

COURSE TEACHING METHODOLOGY

- Teaching Methodology:
  - Face-to-Face synchronous teaching on campus
  - Students will be guided to supplementary reading material also.
- Lecture Details:
  - Since teaching methodology is going to be synchronous, face-to-face on-campus, therefore there will be no pre-recorded lectures.
  - Links to related reference material available online from different sources will also be provided from time to time.
  - All course related resources will be shared via course site on LMS.
  - All course related announcements will be made via course site on LMS.

COURSE DESCRIPTION

The objective of this course is to provide in-depth knowledge of the main ideas, key concepts, and fundamental technology underlying the development, implementation, and use of the integrated enterprise systems. The course explains how such systems provide value addition to businesses. The students will also get hands-on experience in the design, development, and optimization of business processes related to enterprise resource planning (ERP) systems.

COURSE PREREQUISITE(S)

• Prerequisite for CS 486:	• CS340 Databases OR DISC 325 Business Data Management
• Prerequisite for CS 5802:	• Graduate standing AND Instructor's consent

Course Basics

Credit Hours	3			
Lecture(s)	Nbr of Lec(s) Per Week	2	Duration	75 min, MW 5:00 pm – 6:15 pm, Prog Studio
~~Recitation~~/Lab (per week)	Nbr of Lab(s) Per Week	0	Duration	
Tutorial (per week)	Nbr of Tutorial(s) Per Week	As needed	Duration	

COURSE DISTRIBUTION

Core	No
Elective	Yes
Open for Student Category	Seniors, Graduate students
Close for Student Category	Freshmen, Sophomores

EXAMINATION DETAIL		
Midterm Exam	Yes/No: Combine Separate: Duration: Preferred Date: Exam Specifications:	No NA NA NA NA
Final Exam	Yes/No: Combine Separate: Duration: Exam Specifications:	Yes NA 150 mins (may change) Closed book / closed notes

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

• PEO-01	• Demonstrate excellence in profession through in-depth knowledge and skills in the field of Computing.
• PEO-02	• Engage in continuous professional development and exhibit quest for learning.
• PEO-03	• Show professional integrity and commitment to societal responsibilities.

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COURSE LEARNING OUTCOMES (CLOs)	
At the successful completion of the course students will be able to: (Compare, Develop, Engage, Analyze, Discuss, Demonstrate…)	
CLO1	• **GA2-Knowledge for Solving Computing Problems:** 1. (C1-Remember) Explain basic business functional areas and how they are related to each other. 2. (C1-Remember) Explain basic components of ERP Systems and industry best practices. 3. (C1-Remember) Explain basic components of Industry 4.0 and its relation with ERP systems.
CLO2	• **GA3-Problem Analysis - Critical Thinking and Analysis:** 1. (C4-Analyze) **analyze** business requirements that need solutions using ERP systems. Examples of business systems include retail and textile systems. 2. (C4-Analyze) **analyze** organizational readiness for implementing ERP based solutions to meet business challenges.
CLO3	• **GA4-Design / Development of Solutions** 1. (P6-Organization)/(C6-Design) **design** algorithm involving business processes and **use** an Enterprise Resource Planning (ERP) software to **implement** the solution. 2. (P6-Organization)/(C6-Design) **create** analytics and business intelligence applications in an integrated enterprise system environment.
CLO4	• **GA4-Design / Development of Solutions:** 1. (P6-Organization)/ (C5-Evaluate) **evaluate** the correctness and effectiveness of the proposed solution.
CLO5	• **GA7-Communication:** 1. (C2-Understand) **summarize** key concepts of algorithmic design in written form.
CLO6	• **GA9-Ethics - Responsibility:** 1. (A2-Valuing)/(C3-Apply) **value** the importance of relevant standards and ethical considerations and **apply** them to **implement** solutions in an ERP system.

GRADING BREAKUP AND POLICY

Instrument	Weight	Course Learning Objectives (CLO)
Quizzes:	20% (~7-9 quizzes; 2 quizzes will be dropped)	CLO1 – CLO5
Project:	40%	CLO1 – CLO6
Final Exam:	40%	CLO1 – CLO5

Makeup Policy

- No petitions will be accepted for quizzes, labs, and project.
- Petitions will be accepted only for Mid and Final exams provided these are approved by the OSA.
- Please refer to Student Handbook 2022-23, page 41, article 24, titled "Makeup Policy for Graded Instruments".
  "In the case of an instrument with multiple sub instruments, such as quizzes, the instructor may apply best (N-X) policy".
  https://sbasse.lums.edu.pk/sites/default/files/inline-files/Undergraduate%20Student%20Handbook%202022-2023.pdf

COURSE MODULES

Module	Topics	Subtopics	Recommended Readings (CFE)	CLOs
1.	Introduction to ERP	• ERP concept • ERP Architecture • Current industry landscape • Case study		
2.	Industry best practices	• ERP solution design • ERP implementation		
3.	ERP processes	• Data Management • Planning • Accounting and finance • Human resource management • Customer relations management • Procurement • Manufacturing • Inventory and warehouse management • Sales, distribution, and retail • Business intelligence and analytics		
4.	Business process implementation in ERP system	• Data Management • Planning • Procurement • Manufacturing		

		• Inventory and warehouse management • Sales, distribution, and retail • Business intelligence and analytics		
5.	Retail Systems	• Point of sale • Replenishment • Customer engagement • E-commerce		
6.	Industry 4.0	• Internet of Things (IoT) • Smart manufacturing • Connected supply chain • Industry 4.0 in Pakistan		
7.	Ethical and regulatory issues	• Security and data protection • Privacy • Compliance • Human factors		
8.	Organizational readiness	• Change management • ERP system selection • Team building • Total cost of ownership • Return on investment • Reasons for failure • Risk management		

TEXTBOOK(S)/SUPPLEMENTARY READINGS

Books		
Tools and systems	Tools and software systems available for use in course: • caniasERP (https://www.canias40.com/en/erp) • Retail Pro Prism (https://www.retailpro.com) • MySql / Oracle / Postgres • Angular (https://angular.io) • Troia (https://canias.lt/en/modulis/troia-development-tools/, https://www.iastechnologies.com/troia)	
Tutorials	When needed	
Videos	Supplemental videos may also be referred.	
Handouts	Supplemental readings may also be provided.	

HARASSMENT POLICY

- SSE, LUMS and particularly this class, is a harassment free zone. There is absolutely zero tolerance for any behaviour that is intended or has the expected result of making anyone uncomfortable and negatively impacts the class environment, or any individual's ability to work to the best of their potential.
- In case a differently abled student requires accommodations for fully participating in the course, students are advised to contact the instructor so that they can be facilitated accordingly.
- If you think that you may be a victim of harassment, or if you have observed any harassment occurring in the purview of this class, please reach out and speak to me. If you are a victim, I strongly encourage you to reach out to the Office of Accessibility and Inclusion at oai@lums.edu.pk or the sexual harassment inquiry committee at shic@lums.edu.pk for any queries, clarifications, or advice. You may choose to file an informal or a formal complaint to put an end of offending behaviour. You can find more details regarding the LUMS sexual harassment policy here.
- To file a complaint, please write to harassment@lums.edu.pk.

SSE COUNCIL ON EQUITY AND BELONGING

- In addition to LUMS resources, SSE's Council on Belonging and Equity is committed to devising ways to provide a safe, inclusive, and respectful learning environment for students, faculty, and staff. To seek counsel related to any issues, please feel free to approach either a member of the council or email at cbe.sse@lums.edu.pk

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Appendix A: Seoul Accord
Graduate Attributes (GAs) / Program Learning Outcomes (PLOs) / Student Outcomes (SOs)
https://www.seoulaccord.org/document.php?id=79

Sr #	Graduate Attribute	Differentiating Characteristic	… for Seoul Accord (Computing Professional) Graduate
1	**Academic Education**	Educational depth and breadth	Completion of an accredited program of study designed to prepare graduates as computing professionals
2	**Knowledge for Solving Computing Problems**	Breadth and depth of education and type of knowledge, both theoretical and practical	Apply knowledge of computing fundamentals, knowledge of a computing specialization, and mathematics, science, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements
3	**Problem Analysis**	Complexity of analysis	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines
4	**Design / Development of Solutions**	Breadth and uniqueness of computing problems, i.e., the extent to which problems are original and to which solutions have previously been identified or codified	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations
5	**Modern Tool Usage**	Level and appropriateness of the tool to the type of activities performed	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations
6	**Individual and Teamwork**	Role in, and diversity of, the team	Function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings
7	**Communication**	Level of communication according to type of activities performed	Communicate effectively with the computing community and with society at large about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions
8	**Computing Professionalism and Society**	No differentiation in this characteristic except level of practice	Understand and assess societal, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice
9	**Ethics**	No differentiation in this characteristic except level of practice	Understand and commit to professional ethics, responsibilities, and norms of professional computing practice
10	**Life-long Learning**	No differentiation in this characteristic except level of practice	Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional

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Appendix B: Bloom's Taxonomy:

Bloom's Taxonomy:

- https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/

Bloom's Taxonomy – Digital Planning Verbs:

- https://www.teachthought.com/learning/what-is-blooms-taxonomy/

Bloom's Taxonomy Verbs:

- https://www.teachthought.com/critical-thinking/blooms-taxonomy-verbs/

Bloom's Taxonomy – Teacher's Planning Kit

- https://www.cebm.net/wp-content/uploads/2016/09/Blooms-Taxonomy-Teacher-Planning-Kit.pdf

Using Bloom's Taxonomy to Write Effective Learning Outcomes

- Posted by Jessica Shabatura | Jul 26, 2022 | Assignments & Measuring Student Learning
- https://tips.uark.edu/using-blooms-taxonomy/

Bloom's Taxonomy – An Introduction

- https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/teaching-tips/planning-courses-and-assignments/blooms-taxonomy

What is Bloom's Taxonomy?

- https://bloomstaxonomy.net

Bloom's Taxonomy – Revised (Iowa State)

- https://www.celt.iastate.edu/instructional-strategies/effective-teaching-practices/revised-blooms-taxonomy/