

CSE 5235 (Approved): Applied Enterprise Architectures and Services

Course Description

Modeling/analysis of complex enterprise architectures; enterprise patterns (workflow, broker, warehousing); methods for service performance (lean, ontologies, data mining, etc.); emerging topics in semantic cyber-infrastructures, social computation.

Transcript Abbreviation: Enterprise Archit

Grading Plan: Letter Grade

Course Deliveries: Classroom

Course Levels: Undergrad, Graduate

Student Ranks: Senior, Masters, Doctoral

Course Offerings: Spring

Flex Scheduled Course: Never

Course Frequency: Every Year

Course Length: 14 Week

Credits: 3.0

Repeatable: No

Time Distribution: 3.0 hr Lec

Expected out-of-class hours per week: 6.0

Graded Component: Lecture

Credit by Examination: No

Admission Condition: No

Off Campus: Never

Campus Locations: Columbus

Prerequisites and Co-requisites: CSE 5911 or CSE 5912 or CSE 5913 or CSE 5914 or CSE 5915 or CSE 682 or CSE 731 or CSE 758 or CSE 762 or CSE 772 or CSE 778

Exclusions:

Cross-Listings:

The course is required for this unit's degrees, majors, and/or minors: No

The course is a GEC: No

The course is an elective (for this or other units) or is a service course for other units: Yes

Subject/CIP Code: 14.0901

Subsidy Level: Doctoral Course

Programs

Abbreviation	Description
BS CSE	BS Computer Science and Engineering
MS CSE	MS Computer Science and Engineering
PhD CSE	PhD Computer Science and Engineering

General Information

Students who have not taken a CSE capstone course but have had a significant industry internship or job experience should contact the instructor to discuss permission to enroll.

Course Goals

Master enterprise architecture modeling concepts such as external context, service goals, workflows, roles, service and operating level performance, complex components, service provisioning, metrics, and performance measurement.
Be competent with conceptual enterprise modeling, goals and trade-offs, and gap analysis to identify service changes and needed performance improvement.
Be competent with developing specifications for service improvement leading to design.
Be competent with related governance and technology standards (Federal Enterprise Architectures, ISO20000, W3C, and OMG).
Be familiar with the applications of broker, data warehousing, and workflow architecture patterns and their performance improvement through industry cases.
Be familiar with tools and methods for service improvement like data mining tools, social network services, ontologies/OWL/RDF.
Be familiar with the industry practice of applying architecture knowledge for developing strategic options using IT solutions.
Be familiar with techniques to develop a business case for the stakeholders by articulating priorities and their ability to meet service goals.

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Syllabus and course administration, process of research, identifying references, and ethics.	1.0							
Introduction to vocabulary HCI, business processes, supply chains, enterprise architectures and systems, and symbiotic computing; declarative modeling and analysis methods using case studies.	4.0							
Use of performance linkages between services in-the-large and in-the-small, for service level and policy formulation, and evaluation; service life-cycle.	4.0							
Patterns and principles for co-engineering Adaptive Complex Systems to achieve behaviors like Lean, chargeback and capacity alignment, accountability, competitiveness, and innovation.	4.0							
Role of emerging technologies (sensors, mobile, service-oriented architectures) in achieving performance objectives; enterprise architecture patterns (warehousing, mining of operational data, symbiotic computing, social computing, standards).	4.0							
Portfolio development and program management; project specific presentations of research and best practices; guest lecturers from industry representing IT operations management and middleware technologies.	4.0							
Edge-to-enterprise case studies covering trends such as social networking services and their impact on enterprise architectures.	4.0							
Team project methodology, team meetings, and project-relevant research presentations.	15.0							

Representative Assignments

The configuration management of complex IT installations for effective problem resolution at ODJFS.
Chargeback model for IT services at the City of Columbus.
New middleware requirements arising from the changing roles of media and knowledge companies such as the Dispatch and McGraw Hill.
Design of recommender web environments to promote growth of communities of interest at the City of Columbus.
Architecture enhancements for knowledge management within the help desk operations environment at Ohio Health.

Grades

Aspect	Percent
Class participation	20%
Midterm research report	30%
Poster	10%
Research report	30%
Final presentation	10%

Representative Textbooks and Other Course Materials

Title	Author
<i>Various on-line and on-reserve readings from the literature</i>	

ABET-EAC Criterion 3 Outcomes

Course Contribution		College Outcome
**	a	An ability to apply knowledge of mathematics, science, and engineering.
*	b	An ability to design and conduct experiments, as well as to analyze and interpret data.
***	c	An ability to design a system, component, or process to meet desired needs.
***	d	An ability to function on multi-disciplinary teams.
***	e	An ability to identify, formulate, and solve engineering problems.
*	f	An understanding of professional and ethical responsibility.
***	g	An ability to communicate effectively.
***	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
*	i	A recognition of the need for, and an ability to engage in life-long learning.
*	j	A knowledge of contemporary issues.
***	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

BS CSE Program Outcomes

Course Contribution		Program Outcome
**	a	an ability to apply knowledge of computing, mathematics including discrete mathematics as well as probability and statistics, science, and engineering;
*	b	an ability to design and conduct experiments, as well as to analyze and interpret data;
***	c	an ability to design, implement, and evaluate a software or a software/hardware system, component, or process to meet desired needs within realistic constraints such as memory, runtime efficiency, as well as appropriate constraints related to economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability considerations;
***	d	an ability to function on multi-disciplinary teams;
***	e	an ability to identify, formulate, and solve engineering problems;
*	f	an understanding of professional, ethical, legal, security and social issues and responsibilities;
***	g	an ability to communicate effectively with a range of audiences;
***	h	an ability to analyze the local and global impact of computing on individuals, organizations, and society;

Course Contribution		Program Outcome
*	i	a recognition of the need for, and an ability to engage in life-long learning and continuing professional development;
*	j	a knowledge of contemporary issues;
***	k	an ability to use the techniques, skills, and modern engineering tools necessary for practice as a CSE professional;
***	l	an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;
***	m	an ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;
***	n	an ability to apply design and development principles in the construction of software systems of varying complexity.

Additional Notes or Comments

(Representative list below. Will be available in electronic form or on reserve.)

1. Selected readings in Service Science, Balanced Score Card, Five Forces Model, OWL and Ontologies, Social Networks, and Enterprise Transactions.
2. ITIL version 3. http://www.ogc.gov.uk/guidance_itil_4899.asp. "The Official Introduction to the ITIL Service Lifecycle", TSO publications (www.tso.co.uk).
3. TOFAF: A Framework for Information System Architecture. IBM Systems Journal, 26(3), 276-292. Zachman J.A., (1987).
4. A Taxonomy of a Living Model Of The Enterprise. Proceedings of the 2001 Winter Simulation Conference, Larry Whitman, Kartik Ramachandran, Vikram Ketkar.
5. Patterns in Enterprise Software. Fowler, M. (2005). <http://www.martinfowler.com/articles/enterprisePatterns.html> (accessed August 18, 2006).
6. Symbiotic Computing: Concept, Architecture and Its Applications. Takuo Suganuma, Kenji Sugawara, and Norio Shiratori. Indulska et al. (Eds.): UIC 2007, LNCS 4611, pp. 1034-1045, 2007. Springer-Verlag Berlin Heidelberg 2007
7. Swarm Creativity: Competitive Advantage through Collaborative Innovation Networks. Gloor, Peter. Oxford University Press. 2006.
8. Co-engineering the Adaptive Business and Technologies, Collaborative Service-Ontology and Enterprise Architecture Principles for Best Practice Deployment and Performance, IGI Publishing, 2009. Jay Ramanathan and Rajiv Ramnath,
9. Adaptive Complex Systems. (2005 May). Communications of the ACM, 48(5).
10. Relationships Between Game Attributes and Learning Outcomes. Review Simulation Gaming 2009 40: 217, originally published online 26 August 2008, Shawn Burke, Jamie L. Estock, Kara L. Orvis and Curtis Conkey, Katherine A. Wilson, Wendy L. Bedwell, Elizabeth H. Lazzara, Eduardo Salas, C. and Research Proposals. <http://sag.sagepub.com/content/40/2/217>. The online version of this article can be found at: DOI: 10.1177/1046878108321866.
11. GISolve Toolkit: Advancing GIS through Cyberinfrastructure. Shaowen Wang. Department of Geography and National Center for Supercomputing Applications University of Illinois at Urbana Champaign.
12. Other papers as identified during class projects.

Prepared by: Bruce Weide