



Co-funded by the
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Pathway in Enterprise Systems Engineering (PENS)

Enterprise Systems Engineering Introduction

Dr. Yousef Hassouneh

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Birzeit University, Palestine



Motivations: Systems of Systems

- More and more systems are being constructed by integrated existing, independent systems
- A system of systems is a system that contains two or more independently managed elements.
- There is no single manager for all of the parts of the system of systems and that different parts of a system are subject to different management and control policies and rules.
- Source: Software Engineering (10th Edition) [Ian Sommerville]

iLearn as a SoS

- iLearn is a relatively simple technical system but it has a high level of governance complexity.
- The development of a digital learning system is a national initiative but to create a digital learning environment, it has to be integrated with network management and school administration systems.
- There is no common governance process across authorities so, it could be considered as a coalition of systems.
- **Source: Software Engineering (10th Edition) [Ian Sommerville]**

Motivations:

Key Points

- Systems of systems are systems where two or more of the constituent systems are independently managed and governed.
- There are three types of complexity that are important for systems of systems – technical complexity, managerial complexity and governance complexity.
- Reductionism as an engineering method breaks down because of the inherent complexity of systems of systems.
- Reductionism assumes clear system boundaries, rational decision making and well-defined problems. None of these are true for systems of systems.

Enterprise System Engineering

- Enterprise systems engineering (ESE) is a multidisciplinary approach combining systems engineering and strategic management to address methods for aligning system architectures with enterprise business rules and the underlying IT architecture
- This includes the ability to understand and manage large system integration, adaptability and agile evolution, configuration management, capacity and performance planning, reliability, security, and the continuous integration of new capabilities.



Enterprise System Engineering

- enterprise is defined as a complex, socio-technical system comprised of people, processes, information, and technology which interact with each other and their environment to support a common outcome or mission.
- ESE practically started in the early 90's as a technique for describing various aspects of an enterprise, especially for the purpose of analysis, design, optimisation and business process reengineering.
- Due to internal and external influences create a turbulent business environment, enterprises need to become more dynamic.

Project Title

- Title: “Pathway in Enterprise Systems Engineering” (PENS)
- The overall goal of the project is reforming and modernising computing education at undergraduate levels across 4 partner-countries universities, by introducing the Enterprise Systems Engineering to the curriculum .
- Erasmus+ KA2: Capacity Building in the field of Higher Education
- 3-year Project: 15 Oct 2017 – 14 Oct 2020 (3 years)

Consortium

- Partner Countries
 1. Birzeit University, Palestine (coordinator)
 2. Al-Quds University, Palestine
 3. Al-Andalus Software & Technology, Palestine
 4. University of Sousse, Tunisia
 5. University of Monastir, Tunisia
 6. Proxym IT, Tunisia

EU Countries

7. Middlesex University, UK
8. Universidad de Alcala, Spain
9. University of Cagliari, Italy



Project Objectives

- To implement an innovative curriculum in Enterprise Systems Engineering, as an integrated pathway in the existing undergraduate IT program.
- To develop, validate and implement 8 courses and 4 case studies using student-centred adaptive eLearning contemporary education methodology.
- To promote entrepreneurship education by developing a course in digital entrepreneurship
- To improve the level of competencies and skills of staff in partner country universities by (i) training visits for staff to EU partners to develop Enterprise Systems Engineering in curriculum development and innovative learning (ii) providing research collaboration opportunities with EU staff through joint- supervision of students' projects.
- Additionally, to create opportunities of collaboration between academia and industry in the areas of Enterprise Systems.



Project Outcomes

- Training of faculty and tutors
- Develop teaching materials for 8 courses;
Exchange of students and faculty for pilot run of the track
- Develop case studies for student training in Enterprise Modelling, Architecture, Business process and Business Intelligence
- Establish state of the art teaching environment, i.e. custom pedagogy and lab

Program Outcomes (Expected)

- Use systems thinking to evaluate and utilize enterprise system resources to enable organizational goals.
- Evaluate system solutions for their impact and sustainability in social, environmental and economic terms
- Apply system lifecycle models to enterprise resources.
- Analyze risks associated with use of enterprise systems technologies and information resources.
- Apply current security and information assurance processes, techniques, and tools to protect enterprise and community assets.
- Display leadership capabilities and contribute to the effectiveness of a multi-disciplinary team.

Tentative list of Courses

- Systems and data integration
- Digital Business Transformation
- Enterprise System Architecture
- Engineering of Business Processes
- Enterprise Systems
- Business Intelligence and Data Analytics
- System Modelling and Simulation
- Systems Security and Availability

ساهم برأيك في تطوير المنهاج

- الطلبة الأعزاء
- رأيكم مهم جدا في تطوير المنهاج، برجاء زيارة الرابط أدناه وعباً الاستبانة

<http://www.pens.ps/bzusurvey>

- تحتاج اقل من 5 دقائق

yhassouneh@birzeit.edu

Thank you for your attention!



Student Survey

- Please students Your opinion is so **important** to us in developing the Curriculum
- Please go to the link below and fill the Survey, it only tasks few minutes
- <http://www.pens.ps/bzusurvey>