

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education and Scientific Research		وزارة التعليم العالي والبحث العلمي
Syrian Virtual University		الجامعة الافتراضية السورية

## Course Syllabus

### 1- Basic Information:

<b>Course Name</b>	<b>System Engineering</b>
<b>Course ID</b>	SE
<b>Contact Hours (Registered Sessions)</b>	24 Hours
<b>Contact Hours (Synchronized Sessions)</b>	24 Hours
<b>Mid Term Exam</b>	-
<b>Exam</b>	75Min
<b>Registered Sessions Work Load</b>	96 Hours
<b>Synchronized Session Work Load</b>	24 Hours
<b>Credit Hours</b>	6

### 2- Pre-Requisites: No pre-requisite is needed.

### 3- Course Objectives:

The aim of this course is to introduce the main concepts of system engineering. It introduces the general approach to be followed for systems design. Consist of necessary and sufficient activities for analysis, design, modulation, implementation and development of combined systems to satisfy customer needs, taking in consideration, economically promising solutions. It presents the main procedures, methods and tools applied in system engineering for achieving effective solutions.

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### Intended Learning Outcomes (ILO):

Code	Intended Learning Outcomes
ILO1	Understand and give a general description of system. Determine the functional requirements to implement and manipulate it.
ILO2	Prepare the technical specifications according to stockholder document (SRD) of desired system
ILO3	Analyze and simplify the studied system (often complicated) and represent it into several levels to determine the Component Items (CI) and its interfaces to implement and manipulate and develop the system.
ILO4	Be familiar with system engineering procedures, methods and tools to achieve effective solutions.

### 4- Course content (15 hours of synchronized sessions)

Chapter Number	Chapter Title	Summary	ILO
1	System definition	Definition and life cycle of a system.	ILO1
2	Conceptual Design	Determine SRD, System feasibility analysis, system requirements analysis, system design, review of system design	ILO1
3	Primary Design	Analysis of CIs requirements, distribute requirements, determine and design interfaces, CIs design, review of primary design	ILO1

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4	Detailed design and development	Detailed design requirements, Design and integration of system elements, System prototype implementation and development, review of detailed design and development.	ILO2
5	Construction and Production	System operational use and support, Fault report system and corrective actions, Retirement system and disposal.	ILO2
6	SE Definition	Requirement Engineering, Top-Down Approach, system life cycle consideration, system optimisation and balance, Integration of specialties and disciplines .	ILO3
7	SE Management	Technical Reviews and Audits, System test and Evaluation, Management of technical risk, Configuration management, standards and specifications, Integration management, SE Planning management.	ILO3
8	SE Applications	SE benefits, Analysis, Design, Evaluation.	ILO4
9	SE Framework	SE procedures and Tools, related specializations.	ILO4

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### 5- Assessment Criteria (Related to ILOs)

ILO codes	Intended Learning Outcomes	Home work	Synchronized Sessions	Exam
	<b>To achieve ILO the student should be able to:</b>			
<b>ILO1</b>	1- Describe and explain the studied system	*	*	*
	2- Determine the functional requirements for system implementation.	*	*	*
	3- Give a practical vision for system manipulation.	*	*	*
<b>ILO2</b>	1- Discuss the functional mission of the studied system.	*	*	*
	2- Defines the critical marginal areas of the system's performance and sets out the technical specifications for the system or project.	*	*	*
<b>LO3</b>	1- Analyse the studied system and simplify the interfaces between its components and represent the component into several levels.	*	*	*
	2- Discuss how to manipulate the CIs to achieve the ideal performance.	*	*	*
<b>ILO4</b>	1- Use and Apply SE Analysis procedures.	*	*	*
	2- Use and Apply SE methods and tools to find effective and ideal solutions to ensure the desired performance.	*	*	*

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## 6- Main References

- All content of the course can be downloaded from Moodle course page as Pdf files and registered sessions.
- Synchronized sessions.

## 7- Additional References

- “NASA Systems Engineering Handbook”, June 1995.
- “SysML for Systems Engineering”, Jon Holt and Simon Perry, 2008.
- "Decouvrir et comprendre l'Ingenierie Systeme", AFIS (Association Francais d'Ingenierie Systeme), 2009.
- “The Product and Process Focus Within NASA Systems Engineering”, James Heusner / Procedia Computer Science 16 ( 2013 ) 1017 – 1026.
- “Systems Engineering for Business Process Change”, Peter Henderson, Collected Papers from the EPSRC Research Programme, Springer-Verlag London Ltd., ISBN 978-1-4471-1146-7, 2000.