MSC SOFTWARE ENGINEERING
UNIT CODE: ICS 3104
UNIT TITLE: SYSTEMS ENGINEERING
LECTURER: DR. M. W. KIMWELE

COURSE DESCRIPTION

Characteristics of systems engineering. Challenges in a systems engineering project. Scope of a systems engineering problem. Identify the stakeholders and other factors that shape the system requirements. Emergent system properties. Identifying the real problem which the system is intended to solve. Technological and economic considerations in the design process. Interactions between a system and its environment. Integrating the system with existing systems. Systems Optimization

COURSE OUTLINE

WEEK (S)	TOPICS TO BE COVERED
1	**Introduction to Systems Engineering:** Complex systems, Systems engineering, Systems procurement, System development, System operation
2	**Security and Dependability**: Dependability properties, Availability and reliability, Safety, Security
3	**Dependability and Security Specification:** Risk-driven specification, Safety specification, Security specification, Software reliability specification
4	**Dependability engineering:** Redundancy and diversity, Dependable processes, Dependable systems architectures, Dependable programming
5	**Security Engineering:** Security engineering and security management, Security risk assessment, Design for security
6	**Software Reuse:** The reuse landscape, Application frameworks, Software product lines, COTS product reuse
7	**Component-based software engineering:** Components and component models, CBSE processes, Component composition
8	**Distributed software engineering:** Distributed systems issues, Client–server computing, Architectural patterns for distributed systems, Software as a service
9	**Project Management:** Risk management, Managing people, Teamwork
10	**Quality Management:** Software quality, Software standards, Reviews and inspections, Software measurement and metrics
11	**Configuration Management:** Change management, Version management, System building, Release management
12	**Process improvement:** The process improvement process, Process measurement, Process analysis, Process change, The CMMI process improvement framework
13-16	**REVISION AND EXAMINATIONS**

Books

1. Ian Sommerville: Software Engineering
2. Roger S. Pressman: Software Engineering- A Practitioners Approach
3. Rohit Khurana: Software Engineering- Principles and Practices