



"Investing in Africa's Future"

COLLEGE OF ENGINEERING AND APPLIED SCIENCES (CEAS)

NCIS 212: SOFTWARE ENGINEERING

END OF FIRST SEMESTER EXAMINATIONS

NOVEMBER 2025

LECTURER: MS ELIZABETH MAFU

TIME: 3 HOURS

INSTRUCTIONS

1. Answer all questions in Section A.
2. Answer any two questions from Section B.
3. Answer any two questions from Section C.
4. Answer all questions in Sections D and E.
5. All answers must be clear and well-structured.

SECTION A – answer all questions (10 Marks)

1. Which SDLC model is best suited for projects with well-defined requirements?

- a) Spiral b) Waterfall c) Agile d) RAD

2. In UML, which diagram is used to model object interactions over time?

- a) Class Diagram b) Sequence Diagram c) Use Case Diagram d) Activity Diagram

3. A Gantt chart is used for:

- a) Testing b) Scheduling c) Requirement analysis d) Debugging

4. Which testing type verifies that a system meets user needs?

- a) Unit Testing b) System Testing c) Acceptance Testing d) Integration Testing

5. Git is primarily used for:

- a) Requirement elicitation b) Version control c) Deployment d) Testing

6. In Agile development, 'sprint' refers to:

- a) A final delivery stage
b) A short, time-boxed development cycle
c) A bug fix phase
d) None of the above

7. Which principle states that software should be divided into smaller, manageable parts?

- a) Modularity b) Cohesion c) Coupling d) Encapsulation

8. CI/CD refers to:

- a) Continuous Improvement/Continuous Development
b) Continuous Integration/Continuous Deployment
c) Code Inspection/Code Documentation
d) Continuous Innovation/Continuous Delivery

9. Which requirement type specifies performance constraints?

- a) Functional b) Non-functional c) Technical d) User

10. The main advantage of prototyping is:

- a) Reduced costs b) Early user feedback c) Faster testing d) Less documentation

SECTION B – answer any two questions (2x10 =20 Marks)

1. Explain the difference between functional and non-functional requirements with examples.
2. List and briefly describe the four key principles of Agile methodology.
3. Describe the main stages of the Waterfall model.

SECTION C – answer any two questions (2x15=30 Marks)

1. Compare and contrast the Spiral and Incremental Software Development Life Cycle (SDLC) models. Provide advantages and disadvantages for each.
2. Discuss the importance of version control in software projects and explain how GitHub supports collaboration.
3. Explain the role of Software Design Patterns, providing examples of at least three common patterns.

SECTION D – (20 Marks)

Scenario: You have been appointed as a project manager for a student registration system at a university. The system should allow students to register online, view courses, and pay fees.

Question: Using the SDLC approach of your choice, outline the phases you would follow to develop this system, including deliverables for each stage. Justify why you selected that model.

SECTION E – (20 Marks)

Draw and label the following Unified Modelling Language (UML) diagrams for an Online Bookstore System:

- a. Use Case Diagram showing at least 5 use cases.
- b. Class Diagram showing at least 4 classes with attributes and methods.

END OF EXAMINATION