



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya

Tel: +254(0) 799 529 958, +254(0) 799 529 959, + 254 (0) 712 524 293,

Website: info@must.ac.ke Email: info@must.ac.ke

University Examinations 2024/2025

SECOND YEAR FIRST SEMESTER FOR THE DEGREE OF BACHELOR OF SCIENCE IN DATA SCIENCE, BACHELOR OF SCIENCE IN COMPUTER SCIENCE, BACHELOR OF SCIENCE IN COMPUTER SECURITY AND FORENSICS, BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY, BACHELOR OF EDUCATION IN SCIENCE AND EDUCATION ART, BACHELOR OF EDUCATION IN PHYSICS AND COMPUTER, BACHELOR OF SCIENCE IN COMPUTER TECHNOLOGY

FOURTH YEAR FIRST SEMESTER FOR THE DEGREE OF BACHELOR OF SCIENCE IN MATHEMATICS, BACHELOR OF SCIENCE IN MATHEMATICS AND CHEMISTRY

CCS 3201: SOFTWARE ENGINEERING

DATE: JANUARY 2024

TIME: 2 HOURS

INSTRUCTIONS: Answer question *ONE* (Compulsory) and any other *TWO* questions

QUESTION ONE (30 MARKS)

- a) Using examples, differentiate between
 - i. Generic and Customized products (2 Marks)
 - ii. Functional and Non-functional requirements (2 Marks)
 - iii. Verification and validation (2 Marks)
- b) Most economies of developed nations are dependent on software. Define the term Software engineering and state any three key challenges facing software engineering (4 Marks)
- c) It is always believed that the software costs often dominate computer system costs. Explain how COCOMO 2 Model can be used to predict the cost of a software. (4 Marks)
- d) Describe agile software development and list three of its advantages during software development. (6 Marks)
- e) List and explain three ethical Issues of professional responsibility that a software developer needs to adhere during software development (6 Marks)

- f) Define the term software prototyping and state three benefits that comes along with prototyping. (4 Marks)

QUESTION TWO (20 MARKS)

- a) Differentiate between the following as used in software development.
- i. System engineering and software engineering (2 Marks)
 - ii. Black box and white box testing (2 Marks)
 - iii. Plan driven and agile process (2 Marks)
- b) Explain any four benefits of verification and validation in software development (4 Marks)
- c) Define open-source software and explain three any issues that come alone with use of open-source software. (4 Marks)
- d) Discuss the reasons why substantial software systems often take longer to implement than planned and do not perform as well as expected. If you oversaw a large team implementing such a system, how would you ensure that the product was both reliable and finished on time. (6 Marks)

QUESTION THREE (20 MARKS)

- a) State any two advantages and two disadvantages of software reuse (4 Marks)
- b) Define the term user interface and explain three user interface design principles (4 Marks)
- c) Failures are usually due to system errors, describe any three failures that might affect a system (6 Marks)
- d) Change is inevitable in all large software projects. Discuss, and suggest the best suitable software development model that can be used to accommodate change during software development. (6 Marks)

QUESTION FOUR (20 MARKS)

- a) Define the following
- i. Stand-alone application (2 Marks)
 - ii. Embedded control systems (2 Marks)
 - iii. Systems of systems (2 Marks)
- b) Explain two reasons that may prompt an organisation to conduct software update and upgrade. (4 Marks)

- c) Define the term software evolution and describe the step-by-step process involved. (4 Marks)
- d) You are developing control software for a car whose latest model will have a network connection. Software upgrades will be delivered over the air rather than at service visits, so that any security vulnerabilities can be patched quickly. This in turn means that you will have to provide patches, to deal with both security and safety issues for the next 25 years. Discuss how this is likely to affect your development process, and the implications it will have for costs. (6 Marks)

QUESTION FIVE (20 MARKS)

- a) Briefly explain four major challenges facing software engineering (4 Marks)
- b) Name any four factors that affect Software pricing (4 Marks)
- c) Discuss any three types of software maintenance tasks available (6 Marks)
- d) Describe the three types of software process models used in software engineering (6 marks)