SET10101 Software Architecture Coursework

Learning Outcomes Covered:	*LO1: Recognise major and emerging architectural styles and architectural patterns* *LO2: Specify and analyse components and connectors of a software system* *LO3: Generate architectural alternatives for a problem and choose between them* *LO4: Design and construct a software system that satisfies an architectural specification* *LO5: Design and analyse architectures in emerging contexts*
Assessment Type:	Report and Demo
Overall module assessment	60% for Coursework, 40% for Exam
For this assessment:	100% for the Coursework
Assessment Limits:	Report between 8 to 20 pages
Submission Date:	Friday 28 November 2025
Submission Time:	3pm
Submission Method:	Via Moodle
Turnitin:	Unlimited Attempts
Module leader:	Xiaodong Liu
Tutor with Direct Responsibility:	Xiaodong Liu

- You are advised to keep a copy of your assessment solutions.
- Please note regulation Section B5.3.b regards component weighting.
- Late submissions will be penalised following the University guidelines as follows: Up to 5 working days late the grade will be capped at P1, and F5 after 5 working days.
- Extensions to the submission date may only be given by the Module Leader for exceptional circumstances. – by submitting appropriate request form from Extenuating circumstances.

- Feedback on submissions will normally be provided within three working weeks from the submission date.

The University rules on Academic Integrity will apply to all submissions. The student academic integrity regulations contain a detailed definition of academic integrity breaches which includes use of commissioned material; knowingly permitting another student to copy all or part of his/her own work

By submitting the report, you are confirming that:

- It is your own work except where explicit reference is made to the contribution of others.
- It has not been submitted for any module or programme degree at Edinburgh Napier University or any other institution.
- It has not been made with the assistance of Artificial Intelligence (AI) tools [except where and how as has been clearly stated].

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Hand Out Date : 7 October 2025 **% Module Marks : 60%**
Hand In Date : 3pm on Friday 28 November 2025
Local Contact : *Xiaodong Liu*
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Description

A nationwide retailing corporation (such as Homebase http://www.homebase.co.uk/ or B&Q http://www.diy.com/) is planning to develop a new distributed store management system for their retail branches to provide better coordination of their business. The proposed system is named *DE-Store*.

Your company want to pitch for the software development contract and plan to do this by developing a software prototype of an architecture that you believe would show that you could meet the needs of the project.

DE-Store is NOT an online shopping system; instead it is a DISTRIBUTED business management system. You are supposed to use the appropriate architecture styles and technologies you've learnt to develop an effective solution, such as client/server, peer to peer, service-oriented, RMI, three-tiered, etc. DE-Store is expected to be an expandable and adaptive system to accommodate changing business requirements in the future.

DE-Store aims to have a suite of store management functionalities such as price control, inventory control, delivery charge, approval of financial support, and performance analysis.

- *Price Control*: DE-Store allows the store manager to set the price of the products and to select products on a variety of sale offers, which include 3 for 2, buy one get one free, free delivery charges.
- *Inventory Control*: stock is monitored all the time by uploading data from the warehouse database. Items out of stock will be ordered from the central inventory system at the headquarters. DE-Store generates warning messages for items in low stock automatically and also sends them to the mobile message box or email box of the store manager.
- *Loyalty Card*: the store can make further special offers to customers who regularly use their branches.
- *Finance Approval*: DE-Store offers its customer the opportunity to buy now and pay later using an online finance system, *Enabling,* which is linked to DE-Store via a portal. (Hint: you may presume that the *Enabling* finance system already exists, you simply need to call it via a portal).
- *Reports and Analysis*: DE-Store tracks the purchase activities of customers from the accounting database and generates reports on how the store is performing.

You should make a pitch to win this contract as follows:

1. Make a recommendation for **two** architectures that could be adopted, explaining the components and connectors and the protocol for information exchange.

2. Select one of the two candidate architectures and justify your choice in terms of the quality attributes you would expect it to possess.

3. Design and develop a prototype which will demonstrate the principles of the system. For example, you could establish an outline system with prototype components and connectors. This would then be used to demonstrate your competence when you pitch for the contract.

4. Evaluate your system. Try to reassure the company that the completed version will exhibit the quality attributes you identified in 2.

Submission Guidelines

S1. Software Architecture Specification Your first chapter should contain your discussion on the two architectures you have considered (1) and your reasons for selecting one to develop into a prototype (2). Subsequent chapters should include design (3) of your full system and your evaluation (4). This document is recommended to be no less than 8 pages and no more than 20 pages in font size 12, including diagrams. Feel free to use more pages if you need – but make sure you only put the relevant material into your report.

S2. Source Code Please submit all the source code of your prototype via the Moodle coursework submission link. Please note that only a prototype is required but you should try to make its system structure as full as possible (3).

Zip your report together with your source code into one file and submit the file to the Moodle coursework submission link. Remember to complete and attach the Assessment Declaration Cover Sheet.

S3. Demonstration. You will be required to demonstrate your prototype in the D2 lab at your normal practical slots in week 12 and Week 13. For students who have exceptional reasons to be on-campus (e.g., health problem, inevitable travel), please contact the module leader; we may then make special arrangement for you – e.g., online demo. Please note that this is only applicable for exceptional circumstances as the university required.

Marking Schedule

S1 Software Architecture Specification	60 %
i) Description of the two architectures you have considered	15%
ii) The reasons for your selection of one of the architectures to develop the system	15%
iii) The design of your full system	20%
iv) The evaluation of your design and implementation	10%

S2 Implementation	30 %
i) Functionality delivered by your prototype	20%
ii) Quality features delivered by your prototype	10%
S3 Demonstration	10%
Total	100%

The coursework is designed to use your ability to generate architectural alternatives for a problem and choose between them (LO3), then design and construct a software system that satisfies an architectural specification (LO4, LO5). To a lesser extent LO1 and LO2 will also be implicitly covered. These will be explicitly covered in the exam.