**ASSIGNMENT COVER SHEET**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Course: BEng Computing (CN)** | | | | **Year: 2** | | **CSY2027** | |
| **Group Project** | | **Title: Design and Development of departmental computer network for Engineering and Technology Department** | | | | | |
| Date due out:  20th Fab 2023 | Date due in:  7th May 2023 | | Extension date: | | | | Extension agreed by: |
| **Student Names (List each member of the group)** | | | | | | **Tutor: Suresh Gautam (suresh.gautam@nami.edu.np)** | |
| Student comment, specific request for feedback etc. | | | | | Marker’s General View of the work | | |

**ASSESSMENT FEEDBACK:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **RATING SCALE** | **A (A-, A,**  **A+)**  **(Excellen**  **t)** | | **B(B-, B,**  **B+)**  **(Good)** | | **C**  **(C-, C, C+)**  **(Satisfacto ry)** | **D**  **(D-, D, D+)**  **(Needs some more work)** | | **F**  **(F-, F, F+)**  **(Needs much more work)** |
| Requirement  Specifications  Documentation |  | |  | |  |  | |  |
| System Design Documentation |  | |  | |  |  | |  |
| Prototype  Functionality |  | |  | |  |  | |  |
| Testing/Evaluation Strategy |  | |  | |  |  | |  |
| Group Cohesion,  Teamwork and Project Management |  | |  | |  |  | |  |
| System Presentation  and Demonstration |  | |  | |  |  | |  |
| Specific aspects of your assignment that the marker likes: | | | | Specific aspects of your assignment that need more work: | | | | |
| Tutor’s Signature: | | Date: | | | | | Grade: | |

**Design and Development of Prototype Network for Engineering and Technology Department**

**Introduction**

The brand-new Waterside campus is University of Northampton purpose-built campus, designed to provide you with the learning experience and opportunities you expect from a modern university. The University has made large investments in the network infrastructure and other digital services to enhance students’ learning experience. The IT Services, based at Learning hub building manage the network infrastructure.

The Computing department in the Faculty of Art, Science and Technology, unlike other departments, manages some of its own servers - File Server and WWW server, to support computing staff and students. The web server hosts the department website, and also runs the WAMP(Apache, MySql and PHP) server to support student work and File server to archive student and staff files. The File server also runs user authentication services. Some staff members manage their own websites, e.g and deliver their modules both through NILE and personal websites. The module material, including weekly work, assessments and other module related details are saved on the file server.

The Engineering and Technology department is interested in replicating the model of computing department in having their own network.

**Statement of Requirements**

You are required to design, test and implement a prototype network, based on Cisco 3layer hierarchical model for Engineering and Technology department on similar lines to computing department, as described above.

The prototype network as a minimum should support the following network resources and features:

* File, web, Authentication servers
* User authentication of staff
* User authentication of students against enrolled student database
* Staff web pages on the web server with their profiles and module materials saved on the file server
* Three types of users accounts – student, staff and administrator, with different access and privileges to save, access and upload content on file and web server.
* Module leaders can append, edit, delete, upload module materials in their area
* Students could access and organize their content on their X-drive
* Administrator could create/add/delete user accounts for staff and students and administer.
* Remote access to servers from network administrators only
* Wired and wireless access to staff and student area from on-campus

Additionally, you may also like to investigate, discuss and/or implement

* Standalone vs’ virtual servers
* Integration of RADIUS server for user authentication
* Security considerations for on-campus and off-campus access to file server, i.e., staff and students may need access to data on file server from home
* Issues and practices to enable wireless and remote access to servers
* Integration of mobile client devices and
* Scalability, resilience and security of network system;
* And others

For this project, you would also be required to integrate knowledge learnt on other modules, such as Database Technology I, Internet Technology and Internet Programming.

As a prototype network, you are required to evaluate network system of computing department, before embarking on project design and implementation. The evaluation would lend you insight into the essential and desirable features of network system, which could then inform your design and implementation.

**Preliminary Activities**

The background information and system specifications provided in the assignment brief have purposely been left abstract to encourage further investigation into the problem domain including:-

1. The current system
2. Other existing solutions.
3. The potential users of the proposed system and understanding of their requirements of the system.
4. Choice of platform for network infrastructure
5. Any relevant legal/regulatory requirements.

Amongst other things, this will involve carrying out elicitation interviews with network technicians, Narinder Singh.

In order to define the scope of the system and to lay the foundation for the further stages of development, your development team should bear in mind the original brief and relevant problem domain information extracted during the elicitation phase of the project

You may extend the specification in any way thought appropriate; but any such extensions should only be attempted if the key project stakeholders deem them appropriate.

Once a complete understanding of the problem domain has been achieved, you must utilise an appropriate selection of techniques, protocols, platforms, hardware to develop the prototype network solution following Cisco Enterprise network model and the threelayer Cisco hierarchical model.

**What to Deliver?**

Effective project management is essential, and it is expected that **regular group meetings, walkthroughs and technical reviews will be conducted and thoroughly documentedat all stages of project.**

The effectiveness of your project management will be assessed through **observation** and through the quality of your submitted **project log**. You **must** ensure that your tutor is regularly invited to some of your project meetings, walkthroughs or review sessions.

The project deliverables, apart from the separate *Project Management* documentation, are detailed below:-

* Evaluation of existing system.

* Detailed requirements specification documentation, including the following essential key project information: -

* 1. Description of the problem domain
  2. Functional Requirements
  3. Performance Requirements
  4. Design Constraints
  5. Commercial Constraints

* Suitably designed design documentation

As part of your design documentation package, you must include some, if not all of the following: -

a) Delineation of system boundary Possible deliverables:

* + - High-level model of system, possibly in terms of sub-systems which might be developed concurrently
    - Network Design
    - Configuration Scripts and code
* Your test strategy and example test results.

* An overall project evaluation report

As a minimum your final group project report should include the following project management/group activity documentation:

1. A suitably formulated set of project aims and objectives.
2. An overview of team-membership (E.g. assigned roles and responsibilities for each team member)
3. An appropriately represented list of project activities, including estimated durations and resource requirements. (Work Breakdown Structure Diagram +Gantt Chart Diagrams)
4. Any project quality control/monitoring mechanisms employed throughout the project
5. A formally minuted record of each project group meeting, walkthrough and technical review.
6. A final project team performance review.

**When to Deliver?**

The following final deliverable dates should be noted: -

 Last date for *Final Documentation*: (E-submission): **7/May/ 2023**  Last date for *Demonstration***: 7/May/ 2023**

**How will the Project be Assessed?**

The major assessable components of the group project are listed on the assignment coversheet. Assessment marking criteria for each component can be found in the detailed marking sheet enclosed in **Appendix 1**.

The following table provides an overall description as to the weighting of each major deliverable within the assignment.

|  |  |
| --- | --- |
| **Assignment Component** | **Weighting** |
| Requirement Specification Documentation | 10% |
| System Design Documentation  (including network/database etc,..) | 30% |
| Prototype System | 30% |
| Test/Evaluation Strategy | 10% |
| Presentation and Demonstration | 10% |
| Project Management/Teamwork | 10% |

Individual student grades will be extracted from the overall group grade based on individual contribution and peer assessment. (Your tutor will outline the peer assessment procedures used.)

**Personal Development Profile (PDP) implications**

This module has a number of PDP relevant learning objectives. For all students utilising the PDP support infrastructure **Appendix 2** lists the areas suitable for individual reflection and can be incorporated seamlessly into your profile.