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**Computer Science Techniques – Software Testing (AEC)**

**Intro to UNIX, Linux & The Internet**

**COURSE OUTLINE**

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| **Course Code** | **420 – ZE2 – GX** | **Course Length** | **90 Hours** |
| **Course Weighting** | **2 – 4 – 2** | **Credits** | **2.66** |
| **Section** | **31111** | **Semester** | **Winter** |
| **Teacher** | **Raghu Bayya** | **Teacher’s Contact** | **Mio** |
| **First Class** | **4th Feb 2023** | **Last Class** | **23rd April 2023** |

**1 Course Description**

This course targets similar competencies to the 420- SE1-GX course in the sense that students must master concepts related to operating systems (Ministry competency 016Q). It will allow them to configure and adjust two operating systems’ settings: UNIX and LINUX. The combined study of those two operating systems is explained by the many similarities existing between them (e.g. UNIX was used as a base to build LINUX). This course also teaches students basic Internet concepts, such as security while performing penetration tests for example.

**2 Competencies**

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| **INTRODUCTION TO UNIX, LINUX, AND THE INTERNET ( 420-ZE2-GX )** | |
| Exploit the possibilities of an operating system of a specific computer. (016Q) | |
| 1. Make full use of a file management system. | * 1. Comparison of the features and limitations of the file management systems of different operating systems.   2. Correct use of the file management commands.   3. Correct use of directory management commands.   4. Correct use of commands to ensure the security of files and directories.   5. Correct use of utilities to store data and ensure its integrity. |
| 1. Automate tasks. | * 1. Thorough analysis of the job performance features and limitations of different operating systems.   2. Correct use of the operating system's command language.   3. Use of commands to prioritize tasks.   4. Adaption of security measures to task requirements.   5. Application of appropriate debugging techniques to the operating system.   6. Logging of pertinent comments |
| 1. Use memory management methods. | * 1. Analysis of the memory management features and limitations of different operating systems.   2. Memory allocation appropriate for task performance needs. |
| 1. Customize the computer environment. | * 1. Comparison of the different types of configuration files specific to the operating system.   2. Correct use of the workstation's basic configuration commands.   3. Correct use of start-up and peripheral configuration commands.   4. Program start-up suited to user's needs.   5. Adaption of the working environment's configuration parameters to the user's requirements.   6. Precise logging of customization parameters. |
| Analyze the features of the information systems of various companies with a view to developing computer-aided solutions. (0172) | |
| 1. Analyze the general characteristics of the company. | * 1. Examination of the company's mission statement.   2. Examination of the type of company structure.   3. Examination of the corporate culture. |
| 1. Analyze the company's mode of operations | * 1. Complete examination of the principle activities of the company's services.   2. Proper identification of the role and responsibilities of human resources within the company's different services.   3. Complete examination of the methods and tools used in the principle activities.   4. Comparison of company practices versus established operating principles.   5. Complete examination of the company's operational policies. |
| 1. Analyze the characteristics of the flow of information within the company. | * 1. Categorization of the data associated with the different activities.   2. Accurate schematic of how information flows within the company.   3. Use of appropriate terminology. |
| 1. Analyze the measures taken by the company in response to legal requirements and internal policies regarding information. | * 1. Examination of measures designed to ensure information confidentiality (access and diffusion) in view of the different services and work functions.   2. Examination of the means of storing and arranging information.   3. Examination of measures to ensure that copyright is respected.   4. Examination of measures to ensure that intellectual property rights are respected. |



**3 Lesson Plan: Daytime Format (90 Hours)**

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| --- | --- | --- | --- | --- | --- |
| **Module** | **Date** | **Contents/Topics** | **Description** | **Class Activities** | **Competencies & Learning Objectives** |
| **1**  **8hrs** | 4th Feb | Introduction, installation and setup of Linux work station  Virtual machine 3.2 above  The Web 3.0 | System set up and understanding system environment. Creating virtual space, virtual memory. Understanding the perquisites of system setup and troubleshooting. |  | 016Q: 4 (4.1, 4.2, 4.3, 4.4, 4.5, 4.6) |
| **2**  **8hrs** | 11th Feb | File systems, Directories and basic Linux  command.  Terminal overview  Installation of commands, command input output.  Getting to know with command line. | Learn how to install software on new Linux before really understand the topography of the file system.  Compiled useful Linux commands into terminal and shell commands | Use case and  Story mapping  Or  Assignment  On Topic in class | 0161 :1 (1.1, 1.2, 1.3, 1.4, 1.5) |
| **3**  **8 hr** | 11th Feb | Terminal overview  Installation of commands, command input output.  Linux Commands | Using Linux and Unix command for crating directories and file also moving the file and directors. | Use case and  Story mapping  Or  Assignment  On Topic in class | 016Q: 1(1.1, 1.2, 1.5). |
| **4**  **8 hrs** | 18th Feb | Working with system control and listing files and directories.  More about home directory and pathname with commands | Using Linux and Unix command for crating directories and file also moving the file into different location of directories using path name and path find commands. | Use case and  Story mapping  Or  Assignment  On Topic in class | 016Q: 1(1.1, 1.2, 1.5). 3 (3.1, 3.2) |
| **5**  **8 hrs** | 24th Feb | Command argument    Command file search arguments. | To display the content of file on the Linux terminal and search the content of file such different search patterns. Removing the file and directories. | Use case and  Story mapping  Or  Assignment  On Topic in class | 016Q: 3 (3.1, 3.2, 3.3), 0172: 4 (4.1, 4.2, 4.4) |
| **6**  **4 hrs** | 12th March | File System security and user, admin authorization and authentication.  File protocols. | Access rights on file and access rights on directors. Change access rights. | Assignment | 016Q: 1(1.1, 1.2, 1.3), 0172 :4 (4.1, 4.2, 4.3, 4.4) |
| **7**  **8 hrs** | 19th March | Process management and user management. | Hight availability of process scheduling and system security setup | Use case and  Story mapping  Or  Assignment  On Topic in class | 016Q: (4)  0172: (1), (2) |
| **8**  **8 hrs** | 26th March | Linux server setup and configuration | Apache web server develop first for Linux or Unix. For specific program execution on any platform | Use case and  Story mapping  Or  Assignment  On Topic in class | 016Q: (4)  0172: (1), (2) |
| **9**  **8hrs** | 31st March | **Review & Midterm Exam** |  |  |  |
| **10**  **8hrs** | 2nd April | Wildcards filename conventions  Processes and jobs | To background process types and end of the command and process executing program identified by unique (PID) process ID | Use case and  Story mapping  Or  Assignment  On Topic in class | 0172: 2 (2.1, 2.2, 2.3, 2.4, 2.5) |
| **11**  **8hr** | 14th April | Introduction to vi editor and shell scripting. | Shell scripting is written with series of Linux command to perform a specific task.  Shell script execution and error detection. | Use case and  Story mapping  Or  Assignment  On Topic in class | 016Q: (1.1), (2), (3) |
| **12**  **8 hrs** | 16th April | Shell script in practical.  Control structure and iterative and iterative functions. | Creating a simple script, which are program that can run other programs to help automate | Use case and  Story mapping  Or  Assignment  On Topic in class | 016Q: 2 (2.1, 2.2, 2.3, 2.4) |
| **13**  **3hrs** | 21st April | Creating users and group with com Managing the networking connection in local system.  File and directory sharing.  mands. | Covers the software and procedures you use to create, modify and delete accounts and groups.  Sharing of local file and directory in configured local network NAT connection. | Use case and  Story mapping  Or  Assignment  On Topic in class | 016Q: 4, 0172 :4 |
| **14**  **3hrs** | 23rd April | **Review & Final Exam** |  |  |  |

**4 Assessments: Summative (Assessment *of* Learning), Formative (Assessment *for* Learning)**

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| **Assessment Type** | **Evaluated Competency** | **Exam Percentage** | **Summative**  **or**  **Formative?** | **Date of the Evaluation** |
| **Class Assignments** | Assignments or Group activity (Team work) | 20% | Softcopy  Formative | In class |
| **Midterm**  **Exam** | 0161 :1 (1.1, 1.2, 1.3, 1.4, 1.5)  016Q: 1(1.1, 1.2, 1.3), 0172 :4 (4.1, 4.2, 4.3, 4.4) | 30% | Softcopy  Formative | 31st March |
| **In class Lab** | User Stories and story mapping using Linux command and shell script. | 15% | Softcopy  Formative | In class |
| **Final Project** | N/A | N/A | N/A | N/A |
| **Final Exam**  **(Theory)** | 0172: 2 (2.1, 2.2, 2.3, 2.4, 2.5)  016Q: 1(1.1, 1.2, 1.3), 0172 :4 (4.1, 4.2, 4.3, 4.4) | 15% | Softcopy  Formative | 23rd April |
| **Final Exam**  **(Practice)** | 016Q: 4, 0172 :4. 016Q: (4)  0172: (1), (2) | 20% | Softcopy  Formative | 23rd April |

**5 Teaching Method and Learning Activities**

In teaching method, it involves many activates

Lectures: In class lectures will explain students about basic and real time approach with oral and visual presentation.

Assignments: In class assignment on topic explained on same day which make student to internalise the main topic content.

Use Cases or story mapping: From the requirement gathering, problem understand to problem solving approach. Which helps students to understand the root cause of problem and to find different problem-solving techniques.

Brainstorming and milestone: Group activity creating competitive sprite between student and interactive session with teacher.

Labs: Lab from theory to practical approach which is close to real time experience.

**6 Educational Material**

Power point, Pdf’s, Word Documents

Use Cases, flow charts, table and diagrams.

Verbal and visual presentation: Explanation in class and YouTube videos.

Brainstorming and milestones.

**7 Sources / References**

Linux Essential second edition by Christine Bresnaham, Richard Blum

Linux and Unix operating system supported by Beginners guide.

The web 3 and introduction to internet by Tim Berners-Lee

Linux Basics and command introduction by Weesan Lee

Linux Tutorials ( 1 – 6)

Online Resources

https://www.guru99.com/unix-linux-tutorial.html

https://ubuntu.com/

http://linux‐training.be/

https://www.netacad.com/fr/courses/

**Matrix College General Rules**

1. **Attendance**

Attendance is mandatory for the entire length of this course. Missing class without a valid reason and documentation will result in zero in that missed class assignment.

Students should note that by becoming absent, they will be taking the risk of

* Missing important modules of the course which would be useful for the exam and assignments,
* Having certain gaps in their learning which could affect their future career opportunities,
* Losing some marks reserved for your class participation,
* Losing the chance of a “retake” if their final grade falls between 50 and 59.

1. **Success Rate**

Students must obtain a final mark of 60% or more in order to pass a course.

1. **Retake Exam**

Students who receive a final mark of 50% to 59% and have an attendance record of 70% or above can take the “retake final exam”. Students need to apply for the retake within 10 business days from the receipt of the final grades. Moreover Students’ tuition fee payment has to be up to date.

In case of a ‘justified absence’ from an evaluation (such as midterm, final, presentation, etc.) for valid reasons (such as medical reasons, etc.), the student could apply for a retake while supporting his/her application by documents. The academic committee of the college will decide on such cases.

1. **Course Redo**

Students who obtain a final grade 49% or below are required to redo the course. Moreover students who failed a retake exam have to apply for a redo. Students’ tuition fee payment have to be up to date. Students need to make appointments with academic advisors to arrange redo.

1. **Plagiarism**

Students who practice plagiarism (the practice of taking someone else’s work or ideas and passing them off as one’s own) or cheating (act dishonestly or unfairly in order to gain an advantage especially in an examination) will fail the assignment or exam. Students who have plagiarised will lose the chance to do retake exam and must redo the entire course. In this case, the student has to meet the academic advisors in order to sign an academic contract. Repeated act of plagiarism may result in Temporary Suspension or Permanent Suspension of educational services.

1. **Lateness**

Any student arriving late, more than 15 minutes will not be allowed to enter the class and will be marked absent for the first block of hours. This rule also applies to late arrivals after each break and students who leave after the break will be marked absent for the rest of the class.

1. **Bullying and Harassment**

Harassment or bullying is any behaviour that is unwanted by the recipient, is considered objectionable and causes humiliation, offence, distress or other detrimental effect. It is the impact of the behaviour rather than the intent of the perpetrator that is the determinant as to whether harassment or bullying has occurred.

**Harassment** may be, but is not limited to:

* Physical contact: ranging from touching to serious assault, gestures, intimidation, aggressive behaviour
* Verbal: unwelcome remarks, suggestions and propositions, malicious gossip, jokes and banter, offensive language in any form including e-mail or text messages
* Non-verbal: offensive literature or pictures, graffiti and computer imagery, isolation or non-co-operation and exclusion or isolation from social activities

**Bullying** is usually, but not exclusively repeated and persistent behaviour which is offensive, abusive, intimidating, threatening, undermining, malicious or insulting. Bullying could be a conduct that denigrates, ridicules or humiliates an individual, especially in front of peers.

All complaints of harassment or bullying whether raised formally or informally must be notified by the recipient of the complaint to Matrix College Assistant General Director, Mr. Stéphane Rochard.

**Matrix College**

**Evaluation Regulations**

1. The only students having the right to take an evaluation are those registered to the evaluation’s related class. The college must control the students sitting in the class prior to the beginning of the evaluation. All students must have an ID to confirm their identity. Any student without an ID must be expelled from the evaluation room so that the college’s administration can perform an in-depth control. Any student not being registered to the class cannot claim, afterwards, the grade obtained during this class’ evaluation.
2. The college cannot refuse a student the right to take an evaluation because of unpaid fees.
3. No student will be allowed to enter the evaluation room 20 minutes after the evaluation has started. Students may not leave the evaluation room during that time for any reason.
4. Any student who arrives late will not be given any extra time to complete his or her evaluation.
5. Students may be assigned a specific desk/location by the teacher.
6. Students may not bring any food or drink other than water into the evaluation room.
7. No student may bring to the desk any material (coats, bags, texts, notes, books, calculators, etc.) unless previously authorized by the teacher.
8. Students may not hide or place, or arrange to have hidden or placed, any unauthorized or illicit material that may be accessed by themselves or others during an evaluation.
9. All communication devices including but not limited to cell phones, smart phones, smart watches, iPods, pagers and Web-accessible electronic devices must be turned off and left at a place designated by the teacher.
10. The evaluation starts at the teacher’s signal.
11. Communication of any type (verbal, written, body language, etc.) between students is strictly forbidden.
12. Students must hand in all evaluation material to the teacher or invigilator at the end of the evaluation period.
13. The teacher has the authority to dismiss from the evaluation room any student whose behavior could cause a disturbance or could constitute a threat to the safety or security of others.
14. Cheating attempts to cheat or any assistance offered to others will merit for each student involved, a mark of zero on the evaluation. In this case, the teacher will seize the evaluation documents and submit a written report to the Program Coordinator.
15. Any student involved in cheating will receive a mark of zero and the student must REDO the course in its entirety. The student will also be obligated to sign an Academic Contract in order to return to class.
16. Access to the toilets may be authorized at the supervising teacher’s discretion. However, once the first student has handed in his or her evaluation, students are no longer permitted to access the toilets.
17. Students who do not comply with any of the above regulations are liable to be dismissed from the evaluation room.
18. Invigilators have the same powers and the same authority as teachers during evaluations. The teacher of the course remains the head person in control unless delegates that role to another person who is a teacher or invigilator.
19. These rules apply only to summative evaluations, meaning all evaluations which count toward the final grade of a course.

**Matrix College**

**Code of Conduct**

Matrix College is committed to providing a safe, caring and inclusive learning and working environment by promoting respect and responsible citizenship. A positive campus climate exists when all students feel safe, comfortable and accepted. The Code of Conduct outlined apply to all students when:

* on campus
* Outside campus but taking part in a curricular activity.

All students are expected to abide by the following Code of Conduct:

* respect and comply with federal, provincial and municipal laws;
* demonstrate honesty and integrity;
* respect the rights of others and treat one another with dignity and respect at all times, regardless of economic status, race, color, national or ethnic origin, language group, religion, gender, sexual orientation, gender identity, age or ability;
* show proper care and regard for school property and the property of others;
* respect the facilities that are being provided to the students on campus like tables / chairs, computer systems, smart boards etc.,
* respect the decorum of the building
* take appropriate measures to help those in need;
* demonstrate best effort during all College-based curricular or extra-curricular activities  
  Refrain from any violent or bullying behavior (physical, verbal, social, electronic) that intentionally hurts (physically, socially, or emotionally) another person;

In abiding by Matrix College’s Code of Conduct, all students are also expected to refrain from:

* making derogatory or hateful comments toward an individual or group of people;
* threatening an individual or group of people;
* using technology to intentionally abuse or bully another person;
* using technology to interfere with the positive climate of the school;
* refrain from loitering anywhere in the building, horseback riding on each other’s back on campus or in the building, eating food in the common areas, blocking the entrance, smoking in non-permitted areas or attempting to keep the main entrance open during weekends
* refrain from bringing outside food into the restaurant on the ground floor or idling within the restaurant
* using language that is violent, profane or discriminatory;
* Wearing clothes that depict violence, profanity or discrimination.
* Accessing inappropriate materials on their computer.
* Must not engage in sexual harassment or conduct themselves in a way that could be construed as such, for example, by using inappropriate language, keeping or posting inappropriate materials in their work area.

Students must fully understand that Matrix College at its discretion is entitled to initiate legal action permissible under law. Any failure to abide by the above agreement may result for students losing privilege to attend classes.