NAMIBIA UNIVERSITY OF SCIENCE AND TECHNOLOGY

Faculty Name *Computing and Informatics*

Name of Department ***CYBER SECURITY***

COURSE OUTLINE TEMPLATE (Computer Forensics CFR 712S)

STATEMENT ABOUT ACADEMIC HONESTY AND INTEGRITY

All staff and students of the Namibia University of Science and Technology (NUST), upon signing their employment contracts and registration forms, commit themselves to abide by the policies and rules of the institution. The core activity of NUST is learning and in this respect academic honesty and integrity is very important to ensure that learning is valid, reliable and credible.

NUST therefore does not condone any form of academic dishonesty, including plagiarism and cheating on tests and assessments, amongst other such practices. NUST requires students to always do their own assignments and to produce their own academic work, unless given a group assignment.

Academic Dishonesty includes, but is not limited to:

- Using the ideas, words, works or inventions of someone else as if it is your own work.
- Using the direct words of someone else without quotation marks, even if it is referenced.
- Copying from writings (books, articles, webpages, other students' assignments, etc.), published or unpublished, without referencing.
- Syndication of a piece of work, all or part of an assignment, by a group of students, unless the assignment was a legitimate group assignment.
- The borrowing and use of another person's assignment, with or without their knowledge or permission.
- Infringing copyright, including documents copied or cut and pasted from the internet.
- Asking someone else to prepare an assignment for you or to write or sit an assessment for you, whether this is against payment or not.
- Re-submitting work done already for another course or programme as new work, so-called self-plagiarism.
- Bringing notes into an examination or test venue, regardless of whether the notes were used to copy or not.
- Receiving any outside assistance in any form or shape during an examination or test.

All forms of academic dishonesty are viewed as misconduct under NUST Student Rules and Regulations. Students who make themselves guilty of academic dishonesty will be brought before a Disciplinary Committee and may be suspended from studying for a certain time or may be expelled. All students who are found guilty of academic dishonesty shall have an appropriate endorsement on their academic record, which will never be erased.

COURSE INFORMATION

COURSE CODE AND TITLE:

CFR712S: Computer Forensics

DEPARTMENT:

Computer Science

PROGRAMME:

80BSAN - B.IT IN SYSTEMS ADMIN & NETWORKS, 07BACS – Bachelor of Computer Science

CONTACT HOURS:

120(45 – Contact **(**At least 2 hours per week will be face-to-face) ; Directed self-learning and Self-directed learning: 55 hours; Assessment: 20 hours)

NQF LEVEL AND CREDIT:

NQF Level 7

COURSE DESCRIPTION:

The overall aim of the unit is to enable the students to gain an understanding, what computer forensics entails and how it is carried out, what technical tools can be used, and what constraints are imposed by legal considerations. To this purpose, students analyze various scenarios, choose tools relevant to the investigations, and practically carry out forensic tests. The structure of various operating and file systems and their impact on the choice of forensic procedures is an essential part of the course.

PRE-REQUISITES:

Systems Audit

COURSE EQUIVALENCIES:

Computer Forensics CFR311S

COURSE DELIVERY METHODS:

Blended mode of delivery will be implemented i.e. Classroom/Lab face-to-face meeting as well as Online Ms Teams /eLearning for mostly theory content.

The following communication tools will be used in this course:

Email, Discussion Board, Scheduled Chats, Online content on Moodle, announcements on isnotes.

Course Format:

Presentation of material in theory classes and lab demonstrations, learning by assignments, homework, theory and practical exercises.

EFFECTIVE DATE:

03 March 2023

LECTURER INFORMATION

Lecturer's name: Isaac Nhamu
Email: inhamu@nust.na
Office phone: 061 207 2074
Office location: Room 12, IT House, no. 5 Jackson Kaujeua Street
Office hours: 07h30 -16h30
Consultation hours: All lecturers are available for consultation with students. Consultation times can be found on the doors of lecturers' offices.

STUDENT READINESS

Technology & Equipment Readiness:

Windows, Linux, MacOSX, EnCase, FTK Utilities, ProDiscover, Xways, BelkaSoft, Autopsy.

Student Commitments and Contact Times:

Daytime attendance and evening attendance as per course general regulations and the timetable, and online work will also be given from time to time

Course Resources:

Windows, Linux, MacOSX, EnCase, FTK Utilities, ProDiscover, Xways, BelkaSoft, Autopsy.

Prescribed Reading:

1. Nelson B., Philipps A., & Steuart C. (2019). *Guide to Computer Forensics and Investigations*, (6th Ed.) Thomson Course Technology, Boston MA, ISBN: 9781337568944

Recommended Reading:

2. Dave Kleiman ... [et al.]. (2007) *The official CHFI Exam 312-49 Study Guide for Computer Hacking Forensics Investigators* - Burlington : Syngress Publishing, ISBN 9781597491976
3. Robert J. (2006) *Internet Forensics* CRC Press ISBN 9780596100063
4. Edited by Hamid Jahankhani ... [et al.]. (2010) *Handbook of Electronic Security and Digital Forensics* World Scientific: Singapore ISBN 9789812837035
5. William J. Buchanan (2011) *Introduction to security and network forensics* ISBN 9780849335686
6. Tittel E. (2002), *Scene of the Cybercrime - Computer Forensics Handbook* Syngress Publishing, Inc. ISBN: 1-931836-65-5

STUDENT LEARNING

Learning Outcomes:

By the end of this course of study, you should be able to...

1. Analyse the professional and legal environment for computer forensics;
2. Execute basic computer investigations;
3. Secure evidence from computer systems;
4. Gather and analyse digital evidence;
5. Examine DOS/Windows and UNIX based disk structures and file systems;
6. Use data compression and encryption;
7. Use common tools for computer forensics;
8. Perform computer/network forensic analysis;
9. Write investigations reports;
10. Investigate E-mail crimes;
11. Understand the challenges brought by newer technologies in the area of Mobile Forensics and Cloud forensics;
12. Relate basic AI techniques to digital forensics;
13. Relate to the Ethics requirements for the Digital Forensic Examiner and Expert Witness.

COURSE SCHEDULE:

	Topic	**Assignments**
Week 1 27 Feb – 03 Mar	1. **Introduction**	Assignment 1
Week 2 06 Mar – 10 Mar	2. **Computer Forensics as a Profession** a. What is Computer Forensics? b. Technical Challenges c. The Legal Environment d. Ethical considerations for forensics investigators and expert witnesses	Lab 1
Week 3 13 Mar – 17 Mar	3. **Computer Investigations** a. Computer Crime b. Planning an Investigation c. Securing Evidence d. Analysing Evidence	Class exercise
Week 4	4. **Disk and File Structures** a. FAT and NTFS file Systems	Lab 2

20 Mar – 24 Mar	b. DOS and Windows Operating System Issues c. Compression and Encryption d. Macintosh, UNIX and Linux Operating Systems and Disk Structures	
Week 5 27 Mar – 31 Mar	5. **Boot Processes and Special Files** a. Microsoft Boot Tasks b. UNIX and Linux Boot Processes c. Partition Schemes	Lab 3
Week 6 03 Apr – 06 Apr Semester break Use to cover weeks lost earlier	6. **Forensic Tools** a. The Forensic Lab and its Workstations b. Currently available Forensic Software c. Command Line Tools d. Graphical User Interface Tools e. Other useful Tools f. Hardware Tools	Exercise
Week 7 11 Apr – 14 Apr	7. **Forensic Analysis** a. Data Searching b. Email Crimes	Lab 4
Week 8 17 Apr – 21 Apr	c. Data Hiding	Lab 5
Week 9 24 Apr – 28 April	8. **Investigation Reports** a. Importance of Reports b. Writing Guidelines c. Report Content d. Report Formats	Lab 6 Theory Test
Week 10 02 May – 05 May	9. **Email crime investigations forensics**	Lab 7
Week 11 08 May – 12 May	10. **Current Trends in Digital Forensics** a. Cellular networks b. Mobile operating systems c. Cloud forensics d. Cellphone evidence e. Cellphone forensics tools f. Challenges of mobile forensics, cloud forensics Virtual machine forensics	Exercise Practical Test
Week 12 15 May – 19 May	11. Anti-forensics, and Review	Supplementary test
22 May: Submission of semester marks		

IMPORTANT DATES:

NOTE: The following dates are subject to change based on the needs of the students at the lecturer's prerogative. Students will be notified ahead of time of any changes.

Assessment	Date	Venue
Assignment 1	07 April 2023	Open
Theory Test	Tuesday 25 April (11h30-12h30)	IT Labs
Practical Test	Tuesday 09 May (11h30-12h30)	IT Labs
Supplementary Test	Tuesday 16 May (11h30-12h30)	IT Labs

ASSESSMENT AND EVALUATION:

Assessment	Weight
Assignment	20%
Theory Test	40%
Practical Test	40%
Total:	100%

Minimum pass requirement for this course: ***Assessment is:*** 50%. Coursework contribution is 100% There will be **NO** written Final Examination contribution (This course is based on continuous assessment).

COURSE POLICIES

General Academic Policies:

It is the student's responsibility to be familiar with and adhere to NUST's Policies. These Policies can be found in NUST Prospectus or online at www.nust.na/prospectus.

Supplementary Policies:

All assignments should be submitted on or before the deadline. Late assignments will not be assessed. Supplementary exams are for those who miss test or want to improve their grades.

COVID-19 Adherence:

Campus activities that involve physical contact, whether in a meeting, laboratory, assessment, tutorial/lecture will be held under strict COVID-19 National Health and Safety Protocols. Students not adhering to such National Regulations.

DATE REVISED: 03 March 2023

ACKNOWLEDGEMENTS:

ADDITIONAL INFORMATION/FREQUENTLY ASKED QUESTIONS:

FAILURE TO PAY FEES:

A student who fails to pay his/her fees may not be allowed to write the examination and if allowed, the results will be withheld until all outstanding fees are paid in full.

IMPORTANT STUDENT SERVICES AT NUST

There are a variety of services which you can use at the NUST. These services are to your advantage – Use them!!! They include the following:

- Student Counseling and Career Development – Department: Students Services
- Writing Centre and student academic problems –Teaching and Learning Unit (CTL)
- Campus Health and Wellness Centre (CHWC) - Student Services'/ NUST Clinic

AUTHORISATION:

This course is authorised for use by:

_____ _____

Head of Department Date

ACKNOWLEDGEMENT BY STUDENT

(To be completed by all students on the course, detached from the course outline and kept on record in the department)

I,_____, (Student number: _____), hereby acknowledge that I have received this course outline for (Computer Forensics, CFR712S), and that I have familiarised myself with its content, in particular the statement about academic honesty and integrity. I agree to abide by the Policies and arrangements spelt out in this course outline.

_____ _____

Signature of Student Date