



(University of Choice)

**MASINDEMULIROUNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR**

FIRST YEAR, FIRST TRIMESTER EXAMINATION

**FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN HEALTH PROFESSIONS EDUCATION**

COURSE CODE: HPE 206

COURSE TITLE: INFORMATION TECHNOLOGY IN HEALTH

DATE: TIME:

INSTRUCTIONS TO CANDIDATES

All questions are compulsory

Section A: Multiple Choice questions (MCQ'S)

(20 Marks).

Section B: Short answer questions (SAQ's)

(40 Marks).

Section C: Long answer questions. (LAQ'S)

(40 Marks).

TIME: 3 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 5 Printed Pages. Please Turn Over.

John 4/1/2022

Section A: Multiple Choice Questions (MCQS)**20 Marks**

1. If the result of a computation is false, what is the main reason for it?
 - A. Power failure
 - B. The computer circuits
 - C. Incorrect data entry
 - D. Distraction
2. Which technology has increased the availability and access to medical databases across large distances?
 - A. Internet
 - B. LANs
 - C. Smart phones
 - D. None of these
3. Which of the following is odd one out?
 - A. CRT Monitor
 - B. scanner
 - C. Speaker
 - D. Printer
4. Artificial Intelligence (AI) is about.
 - A. Playing a game on Computer
 - B. Making a machine Intelligent
 - C. Programming a computer with your own intelligence
 - D. Putting your intelligence in Machine
5. If a robot is able to change its own trajectory as per the external conditions, then the robot is considered to be?
 - A. Mobile
 - B. flexible
 - C. Open Loop
 - D. Intelligent
6. Which of one of the following is the definition of EHR?
 - A. Software with a full range of functionalities to store, access, and use patient medical information
 - B. A portable, handheld computer with the ability to document directly on the screen with a stylus pen
 - C. Software capable of voice recognition systems to document patient health insurance
 - D. A medical imaging technology which provides economical storage and retrieval
7. Which of the following processes will not change as result of implementation of EHR?
 - A. Documenting the physical exam
 - B. Verifying insurance coverage
 - C. Examining the patient
 - D. Distributing patient education materials
8. Which of the following is not telemedicine?
 - A. Remote monitoring of vital signs
 - B. PowerPoint presentation
 - C. Transmission of still images
 - D. Video conferencing
9. What is asynchronous telemedicine?

- A. When encounters are in real time
 - B. When encounters are not in real time
10. Which one of the following is not an advantage of soft-copy display of medical images?
- A. Decreased number of lost films
 - B. Variations in density or contrast
 - C. Images visualized on film
 - D. Multiple viewing of the same image
11. Medical images that are sent via teleradiology are sent over a
- A. HIS
 - B. WAN
 - C. LAN
 - D. DICOM
12. Essential characteristics of a PACS include:
- 1) Distribution and retrieval of digital images
 - 2) Creation of digital images
 - 3) Radiation dosage documentation
 - 4) Display of digital images
 - 5) Voice-activated dictation
 - 6) Digital image storage and long-term archival
- A. 1,2,4 and 5 only
 - B. 2,3,4,5 and 6 only
 - C. 1,4, and 6 only
 - D. 1,2,3,4 and 6 only
13. MRI is the acronym for?
- A. Magnetic Resonance Image
 - B. Magnified Retina Inspection
 - C. Magnetic Resolution Inspector
 - D. Magnified Radio Image
14. What is Artificial Intelligence used for in health sector?
- A. Making deductions
 - B. Producing new information
 - C. Modifying rules or writing new ones
 - D. Replacing the doctors
15. What does the acronym CAT stand for in Information Technology in Health?
- A. Computer Assessment Technology
 - B. Computer Aided Technology
 - C. Computer Aided Tomography
 - D. Computer Accessories and Technology
16. All of the following are benefits of implementing EHRs except?
- A. Access to a patient's medical information is available at the patient's point of care.
 - B. The health-care provider can easily be informed of past medical history and family medical history
 - C. EHRs are more time-consuming than paper charts
 - D. The health-care provider can easily be informed and access immunization records

17. Which of the following can be eliminated with the use of EHRs?
 - A. Doctors
 - B. Clerical and clinical staff
 - C. Handwritten notes, orders, and prescriptions
 - D. All of the above
18. What is one benefit of an EHR over paper charts?
 - A. EHR is centralized.
 - B. EHR can become cluttered.
 - C. Paper charts are always more accessible than EHR charts.
 - D. EHR cannot be accessed off site.
19. In database management systems the unique identifier for a particular record in a file is
 - A. Data
 - B. Query
 - C. key
 - D. Table
20. Which of the following is a general term used to refer to the application of information and communication technology to health care?
 - A. Tech-health
 - B. Digi-health
 - C. I-health
 - D. E-health

Section B. Short Answer Questions (SAQs)

40 Marks

1. What are the benefits of incorporating ICT systems in hospital setup {5 Marks}
2. Write in full the acronym PACS and describe the four major components of PACS. {6 marks}
3. Define the term telemedicine and mention four advantages of using it {6 marks}
4. What are some of the benefits of having computer networks and internet in a hospital? {5 Marks}
5. Mention four technologies that can be used to realize telemedicine. {4 marks }
6. ~~Outline~~ ^{Describe} the six steps in order that would guide computer programmer in developing a hospital management system. (6 Marks)
7. Mention five emerging trends in technology likely to offer strong potential for new developments {5 Marks}
8. What are some of the health effects in using information communication technologies

Section C. Long Answer Questions (LAQs)

40 Marks

1. Discuss five advantages of PACs {10 Marks}

2. Discuss the challenges encountered when introducing ICT to healthcare sector in developing countries {10 marks}
3. Suggest solutions on how to tackle the challenges in the prior question (two) above {10 Marks}
4. Outline five ways in which you can use a blog {10 marks}

~~Describe~~
Explain

MARKING GUIDE

SECTION A

| | | | |
|------------|-------------|-------------|-------------|
| 1.a | 6.c | 11.d | 16.d |
| 2.a | 7.a | 12.C | 17.c |
| 3.b | 8.b | 13.a | 18.a |
| 4.a | 9.c | 14.b | 19.c |
| 5.d | 10.d | 15.c | 20.b |

SECTION B

1. What are the benefits of incorporating ICT systems in a hospital setup {4 Marks}
 - *Increasing quality in the patient assistance*
 - *Cutting down the medical spending*
 - *Reducing administrative cost*
 - *Possibility to carry on brand new health models*
 - *Educate health professions and patients*
2. Write in full the acronym PACS and describe the four major components of PACS. {6 marks}

Picture Archival and Communication System (PACS)

 - *Image acquisition equipment*
 - *Network for transmission*
 - *Workstations for reviewing and interpreting the images*
 - *Database for storage and retrieval of images*
3. Define the term telemedicine and mention four advantages {6 marks}
 - *Telemedicine is the use of telecommunication and information technologies in order to provide clinical health care at a distance*
 - a. *Cost efficiency*
 - b. *Increased patient engagement*
 - c. *More convenient and accessible patient care*
 - d. *Better patient care quality*
 - e. *Privacy*
4. What are some of the benefits of having computer networks and internet in a hospital? {5 Marks}
 - *The ability to remotely track patient health*
 - *Receiving on-time notifications*
 - *Providing remote medical assistance(Telemedicine)*
 - *Using patient data for medical research.*
 - *Ensuring smart drug monitoring.*

- *Rapid access to information*
5. Mention four technologies that can be used to realize telemedicine. {4 marks }
- *Video teleconferencing*
 - *E-mails*
 - *Online management systems*
 - *Radio calls*
 - *Mobile devices (Cell-phones, tablets)*
6. Outline the six steps in order that would guide computer programmer in developing a hospital management system. (6 Marks)
- *Problem definition*
 - *Problem analysis*
 - *Algorithm development*
 - *Coding and documentation*
 - *Testing and debugging*
 - *Maintenance*
7. Mention five emerging trends in technology likely to offer strong potential for new developments {5 Marks}
- *Internet of Things*
 - *Cloud Computing*
 - *AI*
 - *BlockChain*
8. What are some of the health effects in using information communication technologies {3 Marks}
- *Eye strain*
 - *RSI*
 - *Back and neck pain*

SECTION C

1. Discuss five advantages of PACS {10 Marks}
- *Hard copy replacement*
 - *Remote access*
 - *Electronic image integration platform*
 - *Radiology work flow management*
 - *Enhanced analysis and viewing*
 - *Easy access to patient reports and images*
 - *User friendly software*
2. Discuss the challenges encountered when introducing ICT to healthcare sector in developing countries {10 marks}
- *Funding*
 - *Infrastructure(Computers, electricity,)*
 - *Lack of enough IT Personnel*
 - *Resistance from healthcare workers*
 - *Not supported in training curriculum*
 - *Culture*
 - *content*
3. Suggest solutions on how to tackle the challenges in the prior question (two) above {10 Marks}

- *Identify potential donors for funding*
 - *Incorporating ICT in the training curriculum*
 - *Building the capacity of IT Technical support team*
 - *Involving all the stakeholders*
4. Outline five ways in which you can use a blog {10 marks}
- *Post latest health-related trends and news*
 - *Post materials and resources*
 - *Host online discussions*
 - *Build a class newsletter*
 - *Group projects to co-produce content*
 - *Reflect your teaching and learning experiences*

Course Outline

Year 1 Trimester 1- September to December 2021

Course Lecturer-Mr. Julius Kibet Kiprop

Contact: juliuskibetkiprop@gmail.com; 0724603596

1.0 Course Code: HPE 206:

2.0 Course Title: Information and Communication Technology in Health (3 Units)

3.0 Purpose:

The course introduces students in health professions to ICT use and its applications in learning and provision of health care services with an objective to help the students to be familiar and appropriately use ICT in learning, research and in future as healthcare practitioners. IT has emerged as a powerful force in helping to achieve multiple goals within health care organizations. The course seeks to facilitate a better understanding of these IT initiatives by providing an introduction to basic information technology concepts and terminology, and demonstrating their application in the healthcare delivery and management arena.

3.0 Learning outcomes

- i. Describe the role of ICT in health care (e-health)
- ii. Explain the significance of ICT in teaching and learning in health care professions
- iii. Gain knowledge on current Telemedicine, E-health and emerging technologies in the health sector.
- iv. Describe pedagogical approach to ICT integration in education for the health care professions
- v. Understand general issues and challenges that face ICT in the health sector.
- vi. Utilize technology to support learning in health care training institutions and understand how ICT shape and redefine the health care
- vii. Explain the influence of ICT on globalization

4.0 Content

- ❖ Introduction and discussion of ICT in general; general issues in the use of ICT (basic skills); basic skills in Microsoft windows application programs (MS Word, MS Access, MS PPT, MS Excel),
- ❖ Introduction to Computer Networking, Internet and programming concepts.
- ❖ World wide Web (WWW) infrastructures evolutions and associated innovative service offerings
- ❖ Online- Learning and Open Educational resources
- ❖ Introduction to ICT in health sector
- ❖ Roles and benefits of integrating ICT with health care systems
- ❖ Discussion of examples of ICT Applications used in hospital currently
- ❖ Constraints and challenges faced in using ICT in the health sector of developing countries
- ❖ Emerging trends in technologies that are likely to shape ICT use in health sector
- ❖ Key lessons about use of ICT in the health sector
- ❖ Critical Requirements for successful implementation of ICT in the health sector
- ❖ Lessons on why ICT projects fail

4.0 Learning- Teaching strategy

Lectures, Read and review publications, discussions, Seminars, Conference and Workshop

5.0 Course Requirements

A) Attendance

Attendance for lectures and other scheduled classes/practical/ laboratory sessions is mandatory for all students. Absenteeism will result in student being denied an opportunity to take his/her CAT and End of term Examination.

B) Methods of Assessment

Continuous Assessment Test (CAT) 20%

Take away CAT's 10%

Examination 70%

c) Course texts including further reading/references texts

1. Bligh, D. (1998) *Communication and Information Technologies for teaching and learning in higher Institutions*
2. Wager, K. A., Lee, F. W., Glaser, J. P., & Wager, K. A. (2009). Health care information systems: A practical approach for health care management (2nd ed). Jossey-Bass
3. Omotosho, A., Ayegba, P., Emuoyibofarhe, J., & Meinel, C. (2019). Current State of ICT in Healthcare Delivery in Developing Countries. *International Journal of Online and Biomedical Engineering (IJOE)*, 15(08), 91. <https://doi.org/10.3991/ijoe.v15i08.10294>
4. Improving Health, Connecting People: The Role of ICTs in the Health Sector of Developing Countries. <https://mobidev.biz/blog/technology-trends-healthcare-digital-transformation>
5. Any other relevant book , e-books and internet resources.