CENTRAL UNIVERSITY

SCHOOL OF APPLIED SCIENCES

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

Course Code: ITEC401 **Credit Hour(s)**:**3** **Course Title**: Emerging Technologies

Course Lecturer: *Dr. Kingsford Kissi Mireku* Computer Science Dept. #

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Office Hours: Thursday Time: 6am to 5pm

COURSE OBJECTIVE

This course will help students to demonstrate knowledge of and familiarity with a wide variety of emerging technologies. It will also help students to critically analyze and assess the potential application of emerging technologies in a wide variety of settings.

However, students will also be able to identify, discuss, and debate the social, political, and legal issues surrounding the use of emerging technologies in society.

COURSE DESCRIPTION

This course will focus on the emerging issues in computing today. It aims at introducing students to the new technologies that will influence and shape the world. This course will be organised in seminar format and lectures will be picked from the industry. Students will also research on some topics and present.

Some of the topics are: Cloud Computing, Big data concept and analytics, Data Centre and virtualization, internet of things, 4G/5G Mobile technologies, optical computing, quantum computing, quantum cryptography, virtual reality and wearable computing.

LEARNING OUTCOME

By the end of this course, students should be able to:

- Understand the impact that emerging technologies will have in the future.
- Define the use of emerging technologies such as:
    - Cloud computing,
    - Big data concept and analytics
    - 4G/5G Mobile Technologies,
    - Internet of Things
    - and how they will affect our interaction with a computer system.
- Define the ways in which certain technologies will impact homes of the future.
- Describe some emerging technologies and their uses that are extreme.

COURSE DELIVERY METHODS

This course will be deliver through the means of group presentations and class discussions. The class will create a group and will be presenting on topics provided to them.

A course WhatsApp group for sharing content, collaborative learning, and student-teacher engagement will supplement these methods. All students must subscribe to the class WhatsApp group and the VCAMPUS application.

RECOMMENDED TEXTBOOKS:

Marinescu, D. C. (2013). *Cloud Computing - Theory and Practice.*London, U. K.: Morgan Kaufmann

Kilicoglu, H., D. Shin, et al. (2012). *SemMedDB: a PubMed-scale repository of biomedical semantic predications.*

Guergana K Savova et al (2010). *Mayo Clinical Text Analysis and Knowledge Extraction System (cTAKES): architecture, component evaluation and application.*

Rougier NP, Droettboom M, Bourne PE. (2014) *"Ten simple rules for better figures."* PLoS Computational Biology 10(9): e1003833. PMID: 25210732

West VL, Borland D, Hammond WE. (2015) *"Innovative information visualization of electronic health record data: a systematic review."* Journal of the American Medical Informatics Association.

ASSESSMENT / EVALUATION TECHNIQUES

There will be a group presentation on selected topics.

Mid-semester test will be conducted at the end of December 2024.

Finally, there is a three (3) hours internal closed-book examination.

Evaluation is comprised of:

Class Attendance	5%
Group Presentation and Class Discussion	15%
Mid-Semester Test	20%
End of Semester Exam	60%
TOTAL	**100%**

GRADING POLICY AND SCHEME

Continuous Assessment (40%)

End-of-semester examination (60%)

Kindly refer to the Central University Undergraduate Student Handbook available on the school website for the grading system, bases for incomplete grades, and bases of grade appeals.

EXAMINATION / ACADEMIC INTEGRITY OTHER POLICIES

Please refer to the Central University Undergraduate Student Handbook available on the school website.

COURSE CONTENTS AND SCHEDULE

Session	Topic	Concepts	Learner-centered Activities
1.	Introduction to emerging technology	• Cloud Computing, • Big data concept and analytics, • Data Centre and virtualization, • Internet of things • 4G/5g Mobile technologies, and • Cyber security and Data Privacy	▪ **Assessment Task 1** a. Form a group of Five members b. Decide on **ONE** emerging technology to present in class
2.	Cloud Computing	• Understanding Cloud Computing • Types of Cloud Computing • Cloud services model • Merit and Demerits of cloud computing • Cloud Computing Technologies	• **Assessment Task 2** • Presentation of cloud computing by the first group.
3.	Cloud Computing	• Cloud computing: How can it affect Ghanaian Organizations and Institutions?	**Class discussion**
4.	4G/5g Mobile technologies	• Understanding 2G, 3G, and 4G technologies • Training Methods • Application of 4G • 5G and its application • Key concepts of 5G	a. Presentation of 4G/5g Mobile technologies
5.	Internet of Things - IoT	• Understanding the Internet of Things • The Internet of Things Lifecycle • How the Internet of Things works • Some Applications Of IoT • Technological Challenges Of IoT	**Class discussions**
6.	Data Centre and virsualization	• Understanding Data Centre and Virtualization • How does the organization benefit from this?	**Assessment Task 4** b. Presentation of Data Centre and virtualization
7.	MID-SEMESTER EXAMINATION	**Mid-Semester Assessment Task** An open-book mid-semester exam will be conducted to assess students on the understanding of the course so far.	
8.	Big data concept and analytics	• Understanding Big data concepts and analytics • Data Verses Big Data • Big Data Analytics - Charts & Graphs • Data Analysis Tools	**Assessment Task 3** c. Presentation of Big Data concept and analytics

9.	Big data concept and analytics	Big Data Concept and Analytics: how does Big Data affect Ghanaian Organizations and Institutions?	**Class discussion**
10.	Cyber Security and Data Privacy.	A Seminar to present Cyber Security and Data Privacy in Ghana Else a video clip to explain the seminar held on cyber security.	• **Assessment Task 4** Seminar for the class. An Expert in Cyber Security will be invited to the class
11.	optical, quantum virtual reality, and wearable computing	• Understanding optical computing, • Devices used for optical computing • Application of Optical computers • Advantages and Disadvantages of OC • quantum computing, • quantum cryptography, • virtual reality and wearable computing	d. Presentation of optical, quantum virtual reality, and wearable computing
12.	Summation Reflections	**Second Class Seminar** **Guest Speaker** **i.** Present on emerging technologies and their role in Ghanaian organizations. **ii.** Questions and answers from students **Class Participation** i. Individual questions asked ii. Group Question based on a group project	
13.	Revision		
14.	End-of-semester examinations		
15.	End-of-semester examinations Examination Break		

Thank you.