United States International University

Nairobi Campus, Summer 2015

UNITED STATES INTERNATIONAL UNIVERSITY

SCHOOL OF SCIENCE AND TECHNOLOGY

SPRING 2015

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FIC 4030

INFORMATION SYSTEMS AUDIT

Credit: *3 units*

Prerequisite: *IST 2040 Information Systems & Applications*

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Consultation hours: On Appointment. (Science Blk – Faculty Lounge)

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Class Hours **Monday/Wednesday 5.30 - 7.10 pm LAB 4**

1. Course Rationale

This is a course on of information systems audit and the evaluation of IT management. Analysis and review of internal controls in contemporary computer installations and applications are important in the systems audit. The course includes use of information systems audit techniques and methodologies, including audit software, integrated test facility, and concurrent auditing techniques. Technology audit reviews of the audit requirements for such technologies. Aspect of Business ethics, fraud, and fraud detection are covered.

2. Course Description

This is an introduction course to Information Systems Audit. Topics include Risk Assessment Methodology, Control Objectives for Information and Related Technology (COBIT), Audit practices, IT Deployment Auditing, IT Audit tools and Data Analysis tools (e.g. Audit Command Language - ACL), Interviewing Techniques, IT Fraud Detection, Report Writing Essentials, Bedford's Law and Sampling and Legal/Ethical issues. This course will also provide discussion and practical work on Information Systems Auditing by using modern audit document templates. An overview of the purpose and function of IS Auditing will be conducted with the aim of exploring how audits complement business objectives of companies/organizations.

Prerequisites: IST1010 Introduction to Information Technology
Credit: 3 units

3. Course Learning Outcomes (CLO)

At the end of the course students are expected to:

1. Demonstrate an understanding of the fundamental Principles, Concepts and Practices of Information Security Auditing
2. Perform analysis of internal controls in contemporary computer installations
3. Apply appropriate Information Systems Audit techniques and methodology while auditing systems
4. Perform Network, Operating System, Database and Revenue Audits
5. Use Integrated Test Facilities and Concurrent Auditing techniques
6. Appreciate legal issues relating to Information Security Auditing and abide by a Professional and Ethical Code of Conduct for I.S. Auditors

4. Program Learning Outcomes

Program Learning Outcomes (PLO)

PLO	Aligned to the *following university mission outcomes*:					aligned to the following program learning mission outcomes:					
	Higher order thinking	Global understanding and multicultural perspective	Community service	Literacy	Preparedness for career	Multidiscipline	Experiential	Initiative and problem solving	Team player	Effective Communication	Change Oriented
1. Demonstrate the use of information systems in a business organization	✓	✓		✓			✓	✓	✓	✓	
2. Evaluate IT problems in organizations	✓	✓		✓			✓		✓	✓	✓
3. Apply communication and collaboration skills in IT projects	✓	✓		✓			✓	✓	✓	✓	
4. Design IT solutions for business	✓	✓		✓			✓	✓			

organizations											
5. Solve IT problems in business organizations	✓	✓		✓			✓	✓			
6. Manage Information Systems within their area of specification			✓	✓	✓	✓	✓	✓			

5. Course Learning Outcomes (CLO)

	PLOs/Level					
CLO	*1*	*2*	*3*	*4*	*5*	*6*
CLO Aligned to PLO 1: At the end of the course, students should be able to:						
1. Demonstrate an understanding of the fundamental Principles, Concepts and Practices of Information Security Auditing.	A					A
CLO Aligned to PLO 2: At the end of the course, students should be able to:						
2. Perform Analysis of Internal Controls in Contemporary Computer Installations		A			A	
CLO Aligned to PLO 3: At the end of the course, students should be able to:						
3. Apply appropriate Information Systems Audit techniques and methodology while auditing systems			A			
CLO Aligned to PLO 4: At the end of the course, students should be able to:						
4. Perform Network, Operating System, Database and Revenue Audits				A		
CLO Aligned to PLO 5: At the end of the course, students should be able to:						
5. Use Integrated Test Facilities and Concurrent Auditing techniques		A			A	
CLO Aligned to PLO 6: At the end of the course, students should be able to:						
6. Appreciate legal issues relating to Information Security Auditing and abide by a Professional and Ethical Code of Conduct for I.S. Auditors						A

6. Teaching Methodology

A series of lectures, group discussions and practical exercises will be used to study and internalize the concepts. Audio-visual aids will be used in the lectures. Students will make frequent use of Case Studies and Scenarios in understanding the practicality of IS auditing. The practical exercises will cover the stages of IS Auditing i.e. Planning, Fieldwork, Obtaining Responses, Report Writing and Implementation Tracking, Auditing Database Systems among others. Deliverables will be mandatory during the end of each lecture. Laboratory exercises will be conducted in learning the most popular Computer-Assisted Audit Tools and Techniques (CAATTs) Teammate and Audit Command Language (ACL).

ACTIVE LEARNING METHODOLOGIES

- **Interactive Lecture(s) with Discussions**

Students will be involved in asking questions, giving examples within and after the lecture(s). Each lecture will stress on all IS Audit Concepts and Fundamentals

- **Scenarios/Case Studies and Classroom Discussion**

Students will develop analytic and problem solving skills, practice exploration of solutions for complex issues and apply new knowledge and skills. Each student will be expected to participate in classroom discussions and clearly articulate the IS audit

process and underlying concepts. Deliverables will be derived from Scenarios/Case Studies. These deliverables will be evaluated and used to award marks at the end of the course (see grading scheme below).

- **Group Work**

This method will enable students to undertake the IS Audit process practically. It will provide opportunity for students to assume the roles of Auditor and Auditee. This will provide students with an opportunity to practice their analytical, communication, creativity and decision making skills

- **Guest Speaker**

This will enable students inculcate practical experiences from Industry practitioners.

- **Software:**

Windows 7 Microsoft Office 2010 software, E-Mail software, Firefox Mozilla, Internet Explorer, TeamMate and Audit Command Language (ACL).

- **Specific Lab software in Course Folder**

These will be used for lab assignments

- **Group Reports:**

Each student will be part of a group of up to 4 students. Each group will be expected to contribute an IS Report based on a business scenario/ case study.

- **E-learning Black Board**

Lecture/discussion

All class notes, cases, assignments, lab exercises, and quizzes and practice questions and additional notes will be available on USIU Blackboard, to enable each student to use technology to enhance learning.

7. Course Evaluation

There will be at least two assessed assignments, one mid-term exam and a final exam. In addition, laboratory exercises will be used in the evaluation.

Assignments are due 2 weeks after being handed out and a late assignment will be marked down 25% for every subsequent lesson. Maximum delay is 1 week after which a 0 mark is awarded

Class attendance will contribute to the awarded marks. Missing >25% of class sessions (whether excused or not) is an F grade regardless of marks in assessments.

No Plagiarism, copying or cheating will be tolerated in quizzes, assignments or examinations. It will attract a 0 mark for assignments and quizzes and an F grade for exams. In addition, students may be sent to the Dean's office for further disciplinary action.

There will be NO make-ups for exams as guided by the University Policy unless granted by DVCAA or Dean School of Science and Technology

The lecturer under advisement of the Dean School of Science and Technology has the final word on facilitating classes and assignment of grades.

Distribution of Marks

Attendance and Participation	5%
Class/Group Assignment	20%
Term Paper Assignment	15%
Quizzes	10%
Mid-semester	20%
Final Exam	30%

Grading

Letter grading for distribution of marks is as follows:

Numeric Average (100% Maximum)	Letter Grade
90% and above	A
87-89	A-
84-86	B+
80-83	B
77-79	B-
74-76	C+
70-73	C
67-69	C-
64-66	D+
62-63	D
60-61	D-
0-59	F

8. Assignment & Lab Exercise Hand upload on Blackboard as directed

No late hand in will be accepted. A score of zero will be awarded for assignments not received by due date and time. Quizzes on Web

9. Course Text

Course Text

Information Technology Auditing by James A Hall, 3rd Ed

Recommended Readings

1. Larry Long, *Introduction to computers and Information processing*, 5th Edition, (New York, Prentice-Hall, 1997)
2. Hall James, *Information Technology Auditing*, South Western Cengage Learning, 2011.
3. Knechel, Salterio, Ballou, *Auditing Assurance & Risk*, Thomson South Western, 2007
4. Singleton Hall, Information Technology Auditing and Assurance, 2nd Edition, Thomson North-Western, 2005

10. Course Content

Week	TOPIC	ASSIGNMENT	READING/DISCUSSION TOPICS
Week 1	**WELCOME AND OVERVIEW** This first week will be used to give an outline of the course, discuss the course syllabus, and set expectations on learning outcomes with the students. By the end of this week the students should be clear on what the course aims to deliver and they should have access to all the necessary class materials, course texts and lab resources needed to successfully undertake the course. This includes relevant laboratory software and the Blackboard learning system.		
Week 2	**AUDITING AND INTERNAL CONTROL** ▪ Define what auditing is ▪ Understand the structure of an audit and have a firm grasp of the conceptual elements of the audit process ▪ Describe the internal control objectives and principles ▪ Explain the relationship between general controls, physical controls, IT controls and financial data integrity	Term Paper Assignment	*Ch 1: Information Technology Auditing by James A Hall, 3rd Ed* ▪ Overview of Auditing ▪ Financial Audit components ▪ Structure of an IT Audit ▪ Internal Control objectives and principles ▪ Preventive Detective and Corrective (PDC) controls model ▪ Control Environment, Risk Assessment, Control Activities, Physical Controls, IT Controls
Week 3	**AUDITING IT GOVERNANCE CONTROLS** ▪ Understand the risks of incompatible functions and how to structure the IT function ▪ Be familiar with the controls and precautions required to ensure the security of an organization's computer facilities ▪ Understand the key elements of a disaster recovery plan ▪ Be familiar with the benefits, risks and audit issues related to IT outsourcing	Group Assignment: COBIT review	*Ch 2: Information Technology Auditing by James A Hall, 3rd Ed* ▪ What is IT Governance ▪ IT Governance Controls using COBIT ▪ Auditing the organizational structure of the IT function – organization chart, segregation of duties

Week	TOPIC	ASSIGNMENT	READING/DISCUSSION TOPICS
			▪ Auditing the computer center ▪ Auditing the Disaster Recovery Plan ▪ Audit implications and risks of IT outsourcing (focus on cloud computing)
Week 4	**AUDITING OPERATING SYSTEMS AND NETWORKS** ▪ Be able to identify the principal threats to the operating system and the control techniques used to minimize the possibility of actual exposures. ▪ Be familiar with the principal risks associated with commerce conducted over intranets and the internet and understand the control techniques used to reduce these risks ▪ Be familiar with the risks associated with personal computing systems ▪ Recognize the unique exposures that arise in connection with Electronic Data Interchange (EDI) and understand how these exposures can be reduced	▪ Lab Exercise: Nessus for Operating System and Network Audits using credential scans & selected plugins. ▪ Case study 4: Internal Control and Fraud pg 126 ▪ Case study 7: Operating System Exposures and Controls page 127	*Ch 3: Information Technology Auditing by James A Hall, 3rd Ed* ▪ Operating system security and threats ▪ Operating system controls and audit tests on passwords, malware and viruses, audit trails ▪ Internet and Intranet risks ▪ Network controls for firewalls, Denial of Service attacks, Encryption ▪ Auditing Electronic Data Interchange ▪ Auditing PC-Based Accounting Systems
Week 5	**AUDITING DATABASE SYSTEMS** ▪ Understand the operational problems inherent in the flat-file approach to data management that gave rise to the database approach ▪ Understand the relationships among the fundamental components of the database concept ▪ Recognize the defining characteristics of three database models: hierarchical, network and relational ▪ Be familiar with the audit objectives and procedures used to test data management controls	Class Activities: Lab Exercise: Nessus for Auditing Databases using selected plugins Case Study 5: System configuration for First State Bank pg 168 Quiz 1	*Ch 4: Information Technology Auditing by James A Hall, 3rd Ed* ▪ Key elements of the Database Environment ▪ Database Management System Models ▪ Databases in a Distributed Environment ▪ Controlling and Auditing Data Management Systems (user defined procedures, encryption, biometric, backup controls)

Week	TOPIC	ASSIGNMENT	READING/DISCUSSION TOPICS
Week 6	**AUDITING SYSTEMS DEVELOPMENT AND PROGRAM CHANGE ACTIVITIES** ▪ Identify the stages in the Systems Development Life Cycle and the role of the auditor in ensuring proper system roll outs ▪ Be familiar with the audit objectives, procedures and controls for Systems Development Life Cycle	• Case Study 12: Audit of Systems Development at Balcar Company pg 220 • Course review	*Ch 5: Information Technology Auditing by James A Hall, 3rd Ed* ▪ Information Systems Acquisition ▪ The Systems Development Life Cycle ▪ Auditors Role in System Implementation ▪ Controlling and Auditing the System Development Life Cycle
Week 7	• **MID-SEMESTER EXAM**		
Week 8	**AUDITING FINANCIAL REPORTING SYSTEMS AND ENTERPRISE RESOURCE PLANNING SYSTEMS** ▪ Understand the relationship between traditional accounting records and their digital equivalents in computer-based systems ▪ Understand the technologies used to automate and re-engineer accounting information systems ▪ Use various documentation techniques and audit trails used to trace the path of transactions in a financial reporting systems	▪ Class Assignment: Review of Leading ERP products *(Appendix)*	*Ch 6: Information Technology Auditing by James A Hall, 3rd Ed* ▪ Accounting Records (Manual systems, Audit trail, Computer-based systems) ▪ Documentation Techniques (Data Flow Diagrams, Entity Relationship Diagrams, Flowcharts, Record Layout Diagrams) ▪ Data Coding Schemes ▪ General Ledger system ▪ Financial Reporting System ▪ Enterprise Resource Planning Systems ▪ Enterprise Resource Planning Systems implications on internal controls and auditing

Week	TOPIC	ASSIGNMENT	READING/DISCUSSION TOPICS
Week 9	**COMPUTER-ASSISTED AUDIT TOOLS AND TECHNIQUES (CAATTs)** ▪ Be familiar with the classes of transaction input controls used by accounting applications ▪ Understand the objectives and techniques used to implement processing controls, including run-to-run, operator intervention and audit trail controls ▪ Understand the methods used to establish effective application controls ▪ Know the difference between black box and white box auditing and how to apply them	▪ Class Assignment: Auditing ERP systems	*Ch 7: Information Technology Auditing by James A Hall, 3rd Ed* ▪ Application Controls - Input Controls - Processing Controls - Output Controls ▪ Testing Computer Application Controls - Black-box testing - White-box testing
Week 10	**COMPUTER-ASSISTED AUDIT TOOLS AND TECHNIQUES (CAATTs)** ▪ Describe how application controls are tested using specific CAATT approaches, namely the test data method, integrated test facility and parallel simulation ▪ Use a CAATT approach to perform an audit ▪ Understand the features, advantages, disadvantages of the embedded audit module approach to data extraction ▪ Know the capabilities and primary features of generalized audit software ▪ Be familiar with the more commonly used features of ACL for substantive tests	▪ Lab exercise: Introduction to ACL & TeamMate CAATT Software	*Ch 7: Information Technology Auditing by James A Hall, 3rd Ed* ▪ Test Data Method ▪ Integrated Test Facility ▪ Parallel Simulation ▪ Embedded Audit Module ▪ Generalized Audit Software
Week 11	**AUDITING THE REVENUE CYCLE** ▪ Understand the operational tasks associated with the revenue cycle under different levels of technology ▪ Understand audit objectives related to the revenue cycle ▪ Be familiar with revenue cycle control issues related to alternative technologies ▪ Recognize the relationship between revenue cycle audit objective, controls and tests of controls ▪ Be familiar with the more commonly used features of ACL for substantive	▪ Lab exercise: Using ACL CAATT Software on Revenue Cycle audits ▪ Quiz 2	*Ch 9: Information Technology Auditing by James A Hall, 3rd Ed* ▪ Overview of Revenue Cycle Activities and Documents *(pg 437)* ▪ Revenue Cycle Audit objectives, controls and tests of controls

Week	TOPIC	ASSIGNMENT	READING/DISCUSSION TOPICS
	tests		
Week 12	**AUDITING THE EXPENDITURE CYCLE** ▪ Understand the operational tasks associated with the expenditure cycle under different levels of technology ▪ Understand audit objectives related to the expenditure cycle ▪ Be familiar with expenditure cycle control issues related to alternative technologies ▪ Recognize the relationship between expenditure cycle audit objective, controls and tests of controls ▪ Be familiar with the more commonly used features of ACL for substantive tests	Lab Assignment 3: Using ACL CAATT Software on Expenditure cycle audit	*Ch 9,10: Information Technology Auditing by James A Hall, 3rd Ed* ▪ Overview of Purchases and Cash disbursements activities ▪ Expenditure Cycle Audit objectives, controls and tests of controls
Week 13	**ETHICS AND COURSE REVIEW** ▪ Understand the broad issues pertaining to business ethics ▪ Understand what constitutes fraudulent behavior ▪ Be familiar with common anti-fraud techniques used in both manual and computer-based systems	Class Activities: Course wrap-up and revision	*Ch 12: Information Technology Auditing by James A Hall, 3rd Ed* ▪ Ethical issues in business ▪ Sarbanes-Oxley Act and Ethical issues ▪ Auditor's responsibility for detecting fraud
Week 14	• **FINAL EXAM**		

11. Class Policy : Information for Students

1. **Attendance**: Students are expected to attend classes regularly in accordance with the current USIU Calendar attendance policy. Lab attendance is mandatory.
2. **Class Conduct**: Students are expected to act professionally during class. Respect your instructors and your fellow students. Be considerate to others. Students are required to attend all classes **on time** and should not enter the classroom 15 minutes after the class' scheduled starting time. If you have to leave the class early, please inform the instructor before the class begins. Please sit near the door and exit quietly. If you fail to inform the instructor before you leave, no credit will be given for your class attendance. Please observe the following class rules when the class is in session:
    - Do not talk to your fellow students unless in class work discussions
    - Do not read newspaper or magazine
    - Do not use your hand phone (please turn off your hand phone and beeper)
    - Do not eat or drink in class
    - Do not leave the class without permission

    Any violation of these class rules will be subject to point reduction (e.g., 1 point for each violation) and possible dismissal from the class.
3. **Course Outline Changes**: The material specified in this course outline may be changed by the instructor. If changes are required, they will be announced in class by the instructor.
4. **Illness**: A doctor's note is required for any illness causing you to miss an assignment, quiz, test, or exam. At the discretion of the instructor, you may be allowed to complete the work missed or have the work prorated, (i.e., an average is given according to your performance throughout the course).
5. **There will be at least two assessed assignments**, one mid-term exam and a final exam. In addition, laboratory exercises will be used in the evaluation.
6. **Assignments are due 2 weeks** after being handed out and a late assignment will be marked down 25% for every subsequent lesson. Maximum delay is 1 week after which a 0 mark is awarded

7. **Class attendance will contribute to the awarded marks**. Missing >25% of class sessions (whether excused or not) is an F grade regardless of marks in assessments.

8. **No Plagiarism, copying or cheating will be tolerated in quizzes**, assignments or examinations. It will attract a 0 mark for assignments and quizzes and an F grade for exams. In addition, students may be sent to the Dean's office for further disciplinary action.

9. **There will be NO make-ups for quizzes**, exercises or exams as guided by the University Policy unless granted by DVCAA or Dean School of Science and Technology.

10. **Makeup Tests, Exams or Quizzes**: All tests/exams/quizzes must be taken at the time scheduled. **There will in general be no makeup tests, exams or quizzes**. If you miss a test, exam or quiz, you will in general receive zero marks. Exceptions may be made for documented medical reasons or extenuating circumstances, but you **must** notify your instructor within 24 hours, preferably in advance of the test/quiz/exam. Any evaluations not made up or prorated will receive a grade of 0. **No more than 20% of the course evaluation may be prorated or missed**, otherwise an incomplete or failure will be assessed.

11. A Mid-Semester Examination (20 points)

The mid-term examination will be closed book and closed notes. No make-up examination will be given. Students missing the midterm exam will have the mid term grading weights shifted to the final.

12. A Comprehensive Final Examination (30 points) The final examination will be closed book and closed notes. It covers all the chapters with heavier emphasis on those chapters covered after the mid-term examination.

13. Academic Dishonesty

The University Regulations on academic dishonesty will be strictly enforced. Please check the Students Handbook.

14. Academic dishonesty & ethics

- **Ethics**: USIU assumes that all students attending the University will follow a high standard of ethics. Incidents of cheating or plagiarism will be dealt with in accordance with USIU's Conduct and Attendance Policy in the calendar and may result in a grade of zero for the assignment, quiz, test, exam, or project for all parties involved and/or expulsion from the course.

Academic dishonesty is behavior in which a deliberately fraudulent misrepresentation is employed in an attempt to gain undeserved intellectual credit, either for oneself or for another. It includes, but is not necessarily limited to, the following types of cases:

- **Plagiarism -** The representation of someone else's ideas as if they are one's own. Where the arguments, data, designs, etc., of someone else are being used in a paper, report, oral presentation, or similar academic project, this fact must be made explicitly clear by citing the appropriate references. The references must fully indicate the extent to which any parts of the project are not one's own work. Paraphrasing of someone else's ideas is still using someone else's ideas, and must be **acknowledged**.
- **Unauthorized Collaboration on Out-of-Class Projects** - The representation of work as solely one's own when in fact it is the result of a joint effort or other peoples effort.
- **Cheating on In-Class Exams** - The covert gathering of information from other students, the use of unauthorized notes, unauthorized aids, etc.
- **Unauthorized Advance Access to an Exam** - The representation of materials prepared at leisure, as a result of unauthorized advance access (however obtained), as if it were prepared under the rigors of the exam setting. This misrepresentation is dishonest in itself even if there are not compounding factors, such as unauthorized uses of books or notes. Where a candidate for a degree or other award uses the work of another person or persons without due acknowledgement:

  (a) The relevant disciplinary committee may impose a penalty in relation to the seriousness of the offence;

  (b) The relevant Examiners may report the candidate to the academic council, where there is *prima facie* evidence of an intention to deceive and where sanctions beyond those in (a) might be invoked.

The lecturer under advisement of the Dean School of Science and Technology has the final word on facilitating classes and assignment of grades.