

# SCHOOL OF SCIENCE AND TECHNOLOGY

# SEMESTER: Spring 2015

# COURSE: APT 3040

# LECTURER : L. Mutanu Mwaura

## TIME/DAYS: Tue/Thur 5:40pm-9:00pm

## VENUE: Lab 3

## CREDIT: 3 Units

## OFFICE HOURS: Tue/Thur-8:00am-9:00am, 11:00am-1:00pm, & 3:00pm-5pm

## CONTACT: email: [lmutanu@usiu.ac.ke](mailto:lmutanu@usiu.ac.ke) or Tel: +254-20-3606165

# COURSE RATIONALE

# The purpose of this course is to introduce students to the engineering of computer applications with an emphasis on modern software engineering principles including object-oriented design, decomposition, encapsulation, abstraction, and testing. Programming Methodology teaches the widely-used Java programming language along with good software engineering principles. Emphasis is on good programming style and the built-in facilities of the Java language.

## 1.1 Prerequisite: MIS5010 Data Structures and Algorithms

# LINK TO UNIVERSITY MISSION OUTCOMES

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CLO** | Aligned to the *following university mission outcomes*: | | | | | |
| Higher order thinking | Global understanding and multicultural perspective | Community service | Literacy | Preparedness for career | Leadership and Ethics |
| 1. Write programs using Java; | **✓** |  |  | **✓** | **✓** |  |
| 1. Write programs using object-oriented concepts. | **✓** |  |  | **✓** | **✓** |  |
| 1. Design Programs using UML Diagrams | **✓** |  |  | **✓** | **✓** |  |
| 1. Write web-based programs with java server pages | **✓** |  |  | **✓** | **✓** |  |

# LINK TO SCHOOL MISSION OUTCOMES

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **CLO** | Aligned to the *following school mission outcomes*: | | | | | |  |
| 1. Critical Thinking and Creativity | 1. Effective Communication Skills | 1. Preparedness for Career | 1. Research and Quantitative Skills | 1. Multidisciplinary and Global Perspective | 1. Professional and Ethical Leadership | 1. Service to Community |
| 1. Write programs using Java; | **✓** |  | **✓** |  |  |  |  |
| 1. Write programs using object-oriented concepts. | **✓** |  | **✓** | **✓** |  |  |  |
| 1. Design Programs using UML Diagrams | **✓** | **✓** | **✓** |  |  |  |  |
| 1. Write web-based programs with java server pages | **✓** |  | **✓** | **✓** |  |  |  |

# LINK TO PROGRAM LEARNING OUTCOMES

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **PLO** | **PLO 1** | **PLO 2** | **PLO 3** | **PLO 4** | **PLO 5** | **PLO 6** |
|  | **Demonstrate the use of info. Systems in a business organization.** | **Evaluate IT problems in a business organizations.** | **Apply communication & collaboration skills in IT projects.** | **Design IT solutions for business organizations.** | **Solve IT problems in business organizations** | **Manage info. systems within their area of specialization.** |
| **MIS 6030 -**  **APPLICATIONS DEVELOPMENT** | **I** | **I** |  | **I** | **I** | **B** |

# EXPECTED COURSE LEARNING OUTCOMES

*CLO Aligned to PLO 1 & 2: At the end of the course, students should be able to:*

1. Write programs using Java;
2. Write programs using object-oriented design.

*CLO Aligned to PLO 4,5 & 6: At the end of the course, students should be able to:*

1. Design Programs using UML Diagrams
2. Write web-based programs with java server pages.

# CONTENT & CLASS SCHEDULE:

|  |  |
| --- | --- |
| WEEK | TOPIC |
| WEEK 1 | Introduction to java;   * Expressions and assignment * Console input and output * Flow of control |
| WEEK 2 | Introduction to java;   * Arrays * Methods and Parameters |
| WEEK 3 | Introduction to OOP   * Classes and Objects * information hiding and encapsulation, * overloading, constructors, static methods and static variables, |
| WEEK 4 | Introduction to OOP   * Inheritance basics, encapsulation and inheritance, * polymorphism, abstract classes, * exception handling, throwing exceptions in methods; |
| WEEK 5 | File Input/Output   * The file class, * Text files, binary files, * random access to binary files |
| WEEK 6 | Introduction to UML and patterns;   * Class Diagrams * Use Cases * UML Tools |
| WEEK 7 | Tutorial and Mid Semester Exam |
| WEEK 8 | Introduction to UML and patterns;   * Activity Diagrams * Sequence Diagrams |
| WEEK 9 | Introduction to GUI;   * Interfaces and inner classes, * The swing class; * Event-driven programming, |
| WEEK 10 | Java and database connections |
| WEEK 11 | Web programming with java server pages   * Java and HTML * Java Servlets |
| WEEK 12 | web programming with java server pages   * JSP Scripting Elements * JavaBeans |
| WEEK 13 | Presentations and Tutorials |

# TEACHING APPROACHES

The course will be conducted through lectures, illustrations using computers, and practical labs exercises. Students are required to participate in group discussion, hands-on lab exercises and presentation to reinforce their understanding of the concepts learnt and their application to common programming tools in the industry

# COURSE TEXT & OTHER READINGS

* Savitch, W. (2010). *Absolute Java.* 4th Edition, Boston, MA, Addison-Wesley.
* Bruegge, B., Dutoit, A.H. (2010). *Object-Oriented Software Engineering Using UML, Patterns, and Java.* International Version, 3rd Edition, New Jersey, Pearson Higher Education.

Recommended Readings

* Merx, G.G., Norman, R.J. (2007). *Unified Software Engineering With Java.* Upper Saddle River, New Jersey: Prentice Hall.
* Sebesta, R.W. (2012). *Concepts of Programming Languages*. 10th Edition, Boston, MA: Addison-Wesley.
* Powers, L., Snell, M. (2008). *Microsoft Visual Studio 2008 Unleashed.* Indianapolis, USA: Sams Publishing.

1. KEY INSTITUTIONAL ACADEMIC POLICIES

* Plagiarism will lead to disqualification of the work in question
* Cases of cheating will result to an automatic F
* You will get an F if you miss more than 7 classes
* There will be no make ups without approval from the Dean
* Mobile phones should be switched OFF during class session.
* Computers should only be used for approved classroom activities during class sessions.
* Students who come 10min after class has started will not be allowed into the classroom.

# COURSE EVALUATION

## Assignments & Lab Exercises 10%

## Project 20%

## Quizzes 20%

## Mid-Semester Exam 20%

## Final Exam 30%

**Total 100%**

1. **USIU GRADING SYSTEM**

|  |  |
| --- | --- |
| A 90 – 100  A- 87 - 89  B+ 84 - 86  B 80 - 83  B- 77 - 79  C+ 74 - 76 | C 70 – 73  C- 67 – 69  D+ 64 - 66  D 62 - 63  D- 60 - 61  F 0 – 59 |