1. **TITLE OF COURSE AND COURSE NUMBER**: Internet Applications with Java; CS 4051; Credits: 3.

2. **DESCRIPTION OF THE COURSE**:  
   This course introduces Internet-based applications development with Java technology. Topics include GUI components, threads, concurrent programming, networking, Java Database connectivity (JDBC), Servlets, JavaServer Pages (JSP), JavaBeans, Enterprise JavaBeans, and Mobile Devices.

3. **COURSE PREREQUISITES**: CS 3820 or a two-course sequence in Java.

4. **COURSE OBJECTIVES**: To introduce the Internet-based applications development using the Java technology.

5. **STUDENT LEARNING OUTCOMES**:  
   Upon completion of this course, a prospective student will be able to do the following:  
   1. Write Applets.  
   2. Create threads and synchronize access to data.  
   3. Create a graphical user interface.  
   4. Implement Java networking applications with URLs and sockets.  
   5. Create browsers and Web servers.  
   6. Use the Remote Method Invocation (RMI) to create a distributed computing system.  
   7. Write programs that connect to a database using the Java Database Connectivity Programming (JDBC) interface.  
   8. Write servlets.  
   9. Build, deploy, and use JSP components.  
   10. Write and use beans to build an application.  
   11. Develop enterprise Java beans applications.  
   12. Develop Mobile Information Device Profile (MIDP) network applications.

**TOPICAL OUTLINE OF THE COURSE CONTENT:**

1. Preliminaries  
   a. Class String, arrays, collections, and class ArrayList.  
   b. Input from the standard input using Scanner class and output to the standard output using System.out object.  
   c. Java classes: class variables, class methods, and objects.  
   d. Java programs: source modules, Java API packages, and bytecodes.  
   e. Inheritance.  
2. Packages: static import declaration, creating packages, and import declaration.  
3. Exception Handling.  
4. Files, streams, and object serialization.  
5. GUI components.  
6. Introduction to XHTML, CSS, applets and Java web start.
7. Multimedia: Applets and applications.
8. Multithreading: threads and thread synchronization.
9. Networking
   a. Manipulating URLs.
   b. Client/server interaction with stream socket connections.
   c. Browsers and Web servers.
   d. Remote method invocation (RMI).
10. Accessing Databases with JDBC.
    a. Relational database.
    b. Structured Query Language (SQL).
    c. Connecting to a database.
    d. Retrieving information.
11. Servlets.
    a. Servlet architecture.
    b. Servlet life cycle.
    c. Processing of HTTP requests and responses.
    d. Communications with HTTP servlets.
12. Java Server Pages (JSP)
    a. JSP basics.
    b. JSP standard syntax.
    c. Expression language
    d. Integration with JSP.
    e. Custom Tag library.
    f. JSP XML syntax documents.
    g. JSP debugging and testing.
13. Java Beans
    a. Building with Beans.
    b. Bound and constrained properties.
    c. Writing and packaging a Bean.
    d. Using Beaninfo.
    e. Programming with Beans.
    a. Getting started with EJB.
    b. Entity Beans.
    c. Session Beans.
    d. Servlet and JSP clients.
15. Programming mobile devices.
    a. MIDP programming basics.
    b. User interfaces.
    c. Making connections.
    d. Persistent storage.
    e. Low-level events.

6. GUIDELINES/SUGGESTIONS FOR TEACHING METHODS AND STUDENT LEARNING ACTIVITIES:
   • Classroom lectures followed by examples and lab practices.
   • Open and close lab sessions.
   • Projects supplement and reinforce students’ learning activities.
7. GUIDELINES/SUGGESTIONS FOR METHODS OF STUDENT ASSESSMENT (OUTCOMES):
   - Software projects.
   - Tests and final exam.

8. SUGGESTED READINGS, TEXTS, OBJECTS OF STUDY:

9. BIBLIOGRAPHY OF SUPPORTIVE TEXTS AND OTHER MATERIALS:

10. PREPARER'S NAME AND DATE: Gilbert Ndjatou, March 17, 2011

11. ORIGINAL DEPARTMENTAL APPROVAL DATE: Spring, 2011

12. REVISERS' NAME AND DATE:

13. DEPARTMENTAL REVISION APPROVAL DATE: