

### Request for Graduate Course Addition

- 1. Prepare one paper copy with all signatures and supporting material and forward to the Graduate Council Chair.
- 2. E-mail one identical PDF copy to the Graduate Council Chair. If attachments included, please merge into a single file.
- 3. **The Graduate Council cannot process this application until it has received both the PDF copy and the signed hard copy.**

College: Medicine Dept/Division: Department of Clinical Alpha Designator/Number: CTS 628  Graded  CR/NC

Contact Person: Alfred Cecchetti, PhD, MSc, MSc IS Phone: 304-691-1585

**NEW COURSE DATA:**

New Course Title: Introduction to Java Clinical Programming

Alpha Designator/Number: 

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Title Abbreviation: 

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(Limit of 25 characters and spaces)

Course Catalog Description: 

The focus is to expose CTS students to programming in Java for clinical use cases, especially as it relates to clinical and translational sciences. The course includes OOP's Concepts.
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(Limit of 30 words)

Co-requisite(s): None First Term to be Offered: Summer 2019

Prerequisite(s): None Credit Hours: 4

Course(s) being deleted in place of this addition (must submit course deletion form): None

Signatures: if disapproved at any level, do not sign. Return to previous signer with recommendation attached.

Dept. Chair/Division Head _____	Date _____
Registrar _____	Date _____
College Curriculum Chair _____	Date _____
Graduate Council Chair _____	Date _____

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College: Medicine

Department/Division: Department of Clinical and T Alpha Designator/Number: CTS 628

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Provide complete information regarding the new course addition for each topic listed below. Before routing this form, a complete syllabus also must be attached addressing the items listed on the first page of this form.

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1. FACULTY: Identify by name the faculty in your department/division who may teach this course.

Gouthami Kothakapu, MSc CS

2. DUPLICATION: If a question of possible duplication occurs, attach a copy of the correspondence sent to the appropriate department(s) describing the proposal. Enter "**Not Applicable**" if not applicable.

This course is unique since it focuses on Java programming for clinical use cases (e.g., interfacing with clinical data directly from the data warehouse, Java applications with machine learning). Current course offerings are not medical research oriented.

3. REQUIRED COURSE: If this course will be required by another department(s), identify it/them by name. Enter "**Not Applicable**" if not applicable.

Not Applicable

4. AGREEMENTS: If there are any agreements required to provide clinical experiences, attach the details and the signed agreement. Enter "**Not Applicable**" if not applicable.

Not Applicable

5. ADDITIONAL RESOURCE REQUIREMENTS: If your department requires additional faculty, equipment, or specialized materials to teach this course, attach an estimate of the time and money required to secure these items. (Note: Approval of this form does not imply approval for additional resources.) Enter "**Not Applicable**" if not applicable.

Not Applicable

6. COURSE OBJECTIVES: (May be submitted as a separate document)

Students are expected to learn:

- 1) The process of problem solving, writing programs, and the software life cycle
- 2) Program syntax and error correction
- 3) Importance of GUI
- 4) OOP's concepts
- 5) Test and Debug Programs
- 6) Standard Documentation/ Programming style

### 7. COURSE OUTLINE (May be submitted as a separate document)

Week 1 - Introduction to computer science and history of computing, programming languages  
Week 2 - Algorithms & Efficiency, Java Introduction  
Week 3,4 - Java core concepts  
Week 5 - Advanced Java concepts like class, object, loops, controlled structures  
Week 6 - First look at Java (java syntax data types, Predefined classes)  
Week 7 - Inheritance  
Week 8 - MIDTERM  
Week 9 - Other OOP's Concepts - Abstraction, Polymorphism, Encapsulation  
Week 10 - Arrays, Searching and Sorting  
Week 11 - Constructors  
Week 12 - JDBC, connecting with clinical database systems  
Week 13 - GUI - creating GUI clinical console apps  
Week 14 - FINAL

### 8. SAMPLE TEXT(S) WITH AUTHOR(S) AND PUBLICATION DATES (May be submitted as a separate document)

#### Text and Materials:

Starting Out with Java: From Control Structures through Objects (6th Edition), 2013, Pearson  
ISBN-13: 978-0-13-395705-1

#### Software:

The J2SE Development Kit (JDK) Java 8. <http://java.sun.com>  
NetBeans for Java 8: <http://www.netbeans.org>

### 9. EXAMPLE OF INSTRUCTIONAL METHODS (Lecture, lab, internship)

Lecture

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### 10. EXAMPLE EVALUATION METHODS (CHAPTER, MIDTERM, FINAL, PROJECTS, ETC.)

Class Assignments 30%

Mid-terms 30%

Final Exam 30%

Attendance, In-class activity & participation 10%

### 11. ADDITIONAL GRADUATE REQUIREMENTS IF LISTED AS AN UNDERGRADUATE/GRADUATE COURSE

Not Applicable

### 12. PROVIDE COMPLETE BIBLIOGRAPHY (May be submitted as a separate document)

Mikolajczyk, K., et al. "A JAVA Environment for Medical Image Data Analysis: Initial Application for Brain PET Quantitation." *Medical Informatics*, vol. 23, no. 3, 1998, pp. 207–214., doi:10.3109/14639239809001400

Mcdonald, C. "Open Source Software in Medical Informatics—Why, How and What." *International Journal of Medical Informatics*, vol. 69, no. 2-3, 2003, pp. 175–184., doi:10.1016/s1386-5056(02)00104-1

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Please insert in the text box below your course summary information for the Graduate Council agenda. Please enter the information exactly in this way (including headings):

Department:

Course Number and Title:

Catalog Description:

Prerequisites:

First Term Offered:

Credit Hours:

Department: Department of Clinical and Translational Sciences (DCTS)

Course Number and Title: CTS 628 Introduction to Java Clinical Programming

Catalog Description: The focus is to expose CTS students to programming in Java for clinical use cases, especially as it relates to clinical and translational sciences. The course includes OOP's Concepts.

Prerequisites: None

First Term Offered: Summer 2019

Credit Hours: 4

**CTS 628 Introduction to Java Clinical Programming**  
**Marshall University, School of Medicine**  
**Summer 2019**

**General Information:**

Professor: Gouthami Kothakapu  
Phone: 304-691-6816  
Email: kothakapu@marshall.edu  
Office: 281 TGRI, ECCC 2<sup>nd</sup> Floor  
Lecture: TBA

**Course Description:** The goal of this course is to expose CTS students to programming in Java for common clinical and machine learning problem solving tasks. This course will focus on topics related to object-oriented programming with emphasis on object oriented design and style, classes, recursion, searching and sorting, simple data structures, and graphical user interfaces. This class is accompanied with a regular lab hour.

**Credit Hours:** 4

**Course Focus**

Translational research is concerned with bringing bioscience research discoveries into patient care. Translational studies aim to accelerate research findings from bench (biological or mathematical using animal as well as human vectors) to bedside and into widespread clinical practice.

Students in our courses will learn 1) the language of the medical researcher (e.g., ICD9/10, CPT, LOINC, Animal terminologies, etc.), 2) how to organize data from the electronic medical record as well as other unstructured sources (animal or human) to define the clinical properties of many diseases, 3) the close association of informatics with security and privacy issues and 4) the core functions necessary to develop novel technologies that are used to acquire and analyze translational data in an integrated fashion.

**Text and Materials:**

Starting Out with Java: From Control Structures through Objects (6th Edition), 2013, Pearson.  
ISBN-13: 978-0-13-395705-1

**Software:**

The J2SE Development Kit (JDK) Java 8. <http://java.sun.com>.  
NetBeans for Java 8: <http://www.netbeans.org>

**Program Outcomes:** The goal of this program is to equip physicians in training and other biomedical scientists with information and training they need to translate basic clinical advances into improved patient care that will enhance the quality of life for patients in the Appalachian region, particularly southern West Virginia. Students will receive education in clinical trial design, epidemiology, statistics, informatics, Technology and translational research. Upon successful graduation from this program:

1. Students will be able to lead clinical trials of new drugs and procedures in West Virginia, particularly in its rural regions
2. Students will be strong applicants for positions in schools of medicine and medical centers that have clinical and translational science centers

**Course Outcomes:** The following outcomes have been adopted for this course. All outcomes listed below have direct relevance to course material. Upon completion of this course students will be able to learn:

1. The process of problem solving, writing programs, and the software life cycle.
2. Program syntax and error correction.
3. The importance of creating a good user interface.
4. Object Oriented programming techniques.
5. How to test and debug programs
6. How to write good documentation and programming styles that adhere to standards

**Topical Outline:**

1. Introduction to computer science and history of computing
2. Operating Systems
3. Algorithms, efficiency
4. Introduction to OOP and Java
5. Class/ Object
6. First look at Java (java syntax data types, control structures)
7. String class
8. Inheritance
9. File Simple I/O
10. Arrays, Searching and Sorting
11. Recursion and Iterations
12. Loops and Statements
13. Constructors
14. Other OOP's concepts like Encapsulation, Polymorphism
15. JDBC with clinical databases
16. GUI
17. Practice on Console Applications

**Policies:**

**Attendance Policy:** Attendance is required; notification through email or in the classroom should be at least 24 hours in advance.

**Grading policy:** All missing assignments are graded with zero, late assignments will have a penalty. If submitted after due date will be considered missing if they are not submitted by the following session (one week).

91% - 100% A

81% - 90 % B

71% - 80 % C

61% - 70 % D

51 % - 60% F

**Grade Weights:**

Class Assignments 30%

Mid-terms 30%

Final Exam 30%

Attendance, In-class activity & participation 10%

**Exams and Assignments:** There will be two exams. One during middle of the semester including topics covered earlier. Another exam in the final week includes later topics discussed in the class after midterm. 4-5 assignments can be expected throughout the semester. Additional homework can be given weekly.

**Exam Makeup Policy:** Make-up exams will be given only in the case of a documented emergency or with approval from the instructor at least 24 hours prior to the exam. Make-up exams may be different from the original exam.

**Classroom and Lab Behavior:** The use of mobile devices (making calls, texting, emailing, etc.) is not permitted during class and lab times. You may leave your phone on vibrate or silence mode in order to receive emergency calls.

**Academic Integrity:** All students are expected to present and represent their own original work and properly credit sources used in preparation of their own original work. Discussion of programming assignments and helping each other with debugging is permissible but copying from others or the internet is not permissible.

**Harassment Policy:** MU strongly disapprove and expressly prohibit any form of harassment or discrimination based on race, color, national origin, ancestry, religion, sex, age, sexual orientation, disability, veteran status, marital status or any other characteristic protected by applicable federal, state or local laws.

**ADA Policy:** If a student wishes to be identified as having a physical, mental, or learning disability, that may or may not require reasonable accommodation(s), he/she must register with the Office of Accessibility. These registered students should identify themselves to their instructors and provide a written statement from the Accessibility Office that indicates the appropriate accommodations. The process of a student self-proclaiming the need for accommodation should occur as early in the semester as possible.

**FERPA:** The University is committed to fully respecting and protecting the rights of students under the Family Educational Rights and Privacy Act (FERPA). These rights generally include the right to inspect, review and seek amendment to the student's education records and the right to provide written consent before personally identifiable information from education records is disclosed. Under FERPA, students have the right to file a complaint with the US Department of Education concerning alleged failures to comply with FERPA.