# Course Specifications

## General Information

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|---|---|
| **Course name** | Computer Science (2) |
| **Course number** | ITCS1302 |
| **Faculty** | |
| **Department** | |
| **Course type** | College Needs |
| **Course level** | 1 |
| **Credit hours (theoretical)** | 3 |
| **Credit hours (practical)** | 0 |
| **Course Prerequisites** | |

## Course Objectives

1 - Upon completing this course the student will have learned, through appropriate classroom and laboratory experiences, the following.
2 - Basics of Java language, i/o, data types, control, loops, methods
3 - Basics of OO programming, classes, attributes, objects, instance.
4 - Identifying the implications of inheritance, overloading, polymorphism.
5 - Access modifiers, abstraction, abstract classes, interfaces, packages.
6 - Designing programs using object-oriented design techniques.
7 - Using advanced Java input/output facilities to store data in text files and indexed binary files, Exceptions.
8 - Writing programs that use application program interfaces and graphical user interfaces (GUI) to interface with users and other systems.

## Intended Learning Outcomes

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| **Knowledge and Understanding** | * On successful completion of the course, students should be able to:<br>* a1. Identify basic principles of object-oriented program design.<br>* a2. Identify the basic and some advanced issues related to writing classes and methods - such as data, visibility, scope, method parameters and object references<br>* a3. Explain the basic ideas behind class hierarchies, polymorphism, and programming to interfaces.<br>* a4. Describe the differences between basic I/O streams and graphical user interfaces.<br>* a5. Identify and demonstrate usage of tools, practices and methodologies used in the specification, design and implementation.<br>* d3. Demonstrate efficient IT capabilities. |
| **Intellectual Skills** | * b1. Define traditional and nontraditional problems, set goals towards solving them, and. observe results.<br>* b2. Identify attributes, components, relationships, patterns, main ideas, and errors.<br>* b3. Describe different classifications of (data, results, methods, techniques, algorithms, etc.).<br>* b4. Identify a range of solutions and critically evaluate and justify proposed design solutions.<br>* b5. Apply the concepts, principles, theories and practices underpinning computing as an academic discipline. |
| **Professional Skills** | * c1. Solve a given application problem by going through the basic steps of program specifications, analysis, design, implementation within the context of the object-oriented paradigm.<br>* c2. Demonstrate solid Java programming skills and ability to put in practice the acquired knowledge and understanding of the Java language and object-oriented design in relatively simple case studies.<br>* c3. Develop Java implementations of abstract data types using different approaches, and evaluate their differences.<br>* c4. Apply tools and techniques for the design and development of applications. |
| **General Skill** | * d1. Communicate effectively by oral, written and visual means.<br>* d2. Work effectively as an individual and as a member of a team.<br>* d4. Lead and motivate individuals.<br>* d5. Manage tasks and resources.<br>* d6. Work in stressful environment and within constraints. |

## Course Contents

1 - Basics of the OO language of interest such as Java that include program structure, data types, I/O, control, loops, methods, methods overloading and overriding. Matrices, strings.

2 - Object oriented paradigms , classes, objects, instances, inheritance, abstraction, interfaces, polymorphism, data hiding, visibility scopes, packages.

3 - File i/o and streams, graphical user interface (GUI) designs packages and tools, events and event handling, java applets.

## Teaching and Learning Methods

1 - Lectures

2 - Tutorial Exercises

3 - Practical Exercises

4 - Projects

## Students Assessment

| Assessment Method | TIME | MARKS |
|---|---|---|
| Final Exam | Week 16 | 50% |
| Practical Exercises | | 15% |
| Mid-Term Exam | Week 8 | 20% |
| Projects | | 15% |

## Books and References

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| Course note | Short course notes available at doctor's office. |
| Essential books | Y.Daniel, Liang , Introduction to Java Programming, 7thed, 2008. |
| Recommended books | C. Thomas Wu, An introduction to OO programming with Java, Second Edition 2001. |
| | H. M. Deitel and P.J. deitel, Java How to Program, Fourth Edition 2002. |

## Knowledge and Skills Matrix

| Main Course Contents | Study Week | Knowledge and Understanding | Intellectual Skills | Professional Skills | General Skill |
|---|---|---|---|---|---|
| Basics of the OO language of interest such as Java that include program structure, data types, I/O, control, loops, methods, methods overloading and overriding. Matrices, strings | 1-4 | a1 | b1, b3, b4, b5 | c1 | d1-d6 |
| Object oriented paradigms , classes, objects, instances, inheritance, abstraction, interfaces, polymorphism, data hiding, visibility scopes, packages | 5-9 | a1-a3 | b2, b4, b5 | c2-c4 | d1-d6 |
| File i/o and streams, graphical user interface (GUI) designs packages and tools, events and event handling, java applets | 9-14 | a4, a5 | b5, c2 | c4 | d1-d6 |