

# TEMPLATE FOR COURSE SPECIFICATION

## HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

### COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Al-Nahrain University/ College of Science
2. University Department/Centre	Computer Science department
3. Course title/code	Algorithm design and analysis
4. Modes of Attendance offered	Full Time
5. Semester/Year	Second Semester/ Second Year
6. Number of hours tuition (total)	30 Theory + 30 Practical
7. Date of production/revision of this specification	2021-2022
8. Aims of the Course	<ul style="list-style-type: none"><li>• Preparing graduates who have experience in the basis of data structures, types, and optimal methods of storing them in the computer and transferring them.</li><li>• Implementation of multiple algorithms, the purpose of which is to see these algorithms and show the best ones in terms of speed of implementation.</li><li>• A student is also prepared with the ability to understand the problems to be solved and to find the desired goal represented by the solution to these problems through data collection and analysis.</li><li>• Preparing graduates with experience in the basis of data, its types, and the optimal methods of storing it in the computer and transferring it.</li></ul>

## 9· Learning Outcomes, Teaching ,Learning and Assessment Methode

### A- Cognitive goals Knowledge and Understanding

- A1. Basic knowledge about data and information, and how to manage them.
- A2. Focus on learning java program from data structure's fundamentals and methods.
- A3. Comparing between known methods from time and space point of view.

### B. The skills goals special to the course.

- B1. The ability to use Java language, and applying the theory fundamentals and its use in different algorithms.
- B2. Improve the student's analysis and conclusion capabilities.

### Teaching and Learning Methods

Books and theoretical lectures in addition to laboratory work, discussion and asking questions that help the student to analyze and conclude.

### Assessment methods

- Monthly exams + daily surprise exams + homework.
- Classroom posts and discussions.
- Daily assessment of practical performance in the laboratory.
- Determining a grade for daily attendance.
- Determine the degree of adherence to the dress.

### C. Affective and value goals

C1-Question: Looking for new information and raising questions.

C2 - Conclusion and Deduction: Thinking about what is beyond the available information to fill the gaps in it.

C 3 - Comparison: Note the aspects of ratios and differences between things.

C4 - Classification: Putting things into groups according to common characteristics.

D. General and rehabilitative transferred skills (other skills relevant to employability and personal development)

D1. Be able to program a real problem using a computer.

D2 - Conducting experiments to develop an existing system and building a model for any system by collecting and analyzing information.

### 10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2 theory + 2 Lib		Algorithm fundamental and Properties	Formal Lectures	Class Activity
2	=		<b>Analysis of an Algorithm</b> <b>Algorithm Complexity</b>	Formal Lectures	Class Activity and Quiz
3	=		<b>How to Determine Complexities</b> <b>Searching methods</b>	Formal Lectures	Class Activity and Quiz
4			<b>Mid1</b>		
5	=		<b>Binary Tree</b>	Formal Lectures	Class Activity
6	=		<b>Tree Traversals</b>	Formal Lectures	Class Activity
7	=		<b>Deletion in a Binary Tree</b>	Formal Lectures	Class Activity and Quiz
8			Mid2		
9	=		<b>Sorting methods</b>	Formal Lectures	
10,11	=		Bubble sort, selection sort, insertion sort	Formal Lectures	Class Activity
12,13	=		Shell sort, merge sort	Formal Lectures	Class Activity and Quiz
14,15	=		Quick sort	Formal Lectures	Class Activity and Quiz

### 11. Infrastructure

1. Books Required reading:

**Algorithms, Fourth Edition** / Robert Sedgewick and Kevin Wayne, Princeton University, Addison-Wesley 2011

**Supporting Books**

- **Data Structures and Algorithms in Java™**, Sixth Edition, Michael T. Goodrich, Roberto Tamassia, and Michael H. Goldwasser, Wiley, 2014

2. Main references (sources)	<p><b>Algorithms, Fourth Edition</b> / Robert Sedgewick and Kevin Wayne, Princeton University, Addison-Wesley 2011</p> <p><b>Supporting Books</b></p> <p>- <b>Data Structures and Algorithms in Java™</b>, Sixth Edition, Michael T. Goodrich, Roberto Tamassia, and Michael H. Goldwasser, Wiley, 2014</p>
A- Recommended books and references (scientific journals, reports...).	
B-Electronic references, Internet sites...	
12. The development of the curriculum plan	
<ul style="list-style-type: none"> <li>• Suggest new algorithms to improve software performance.</li> <li>• Expansion of the concepts covered in the lectures.</li> </ul>	