

Programme Summary

1. Programme Name: Software Engineering

2. Programme Objectives:

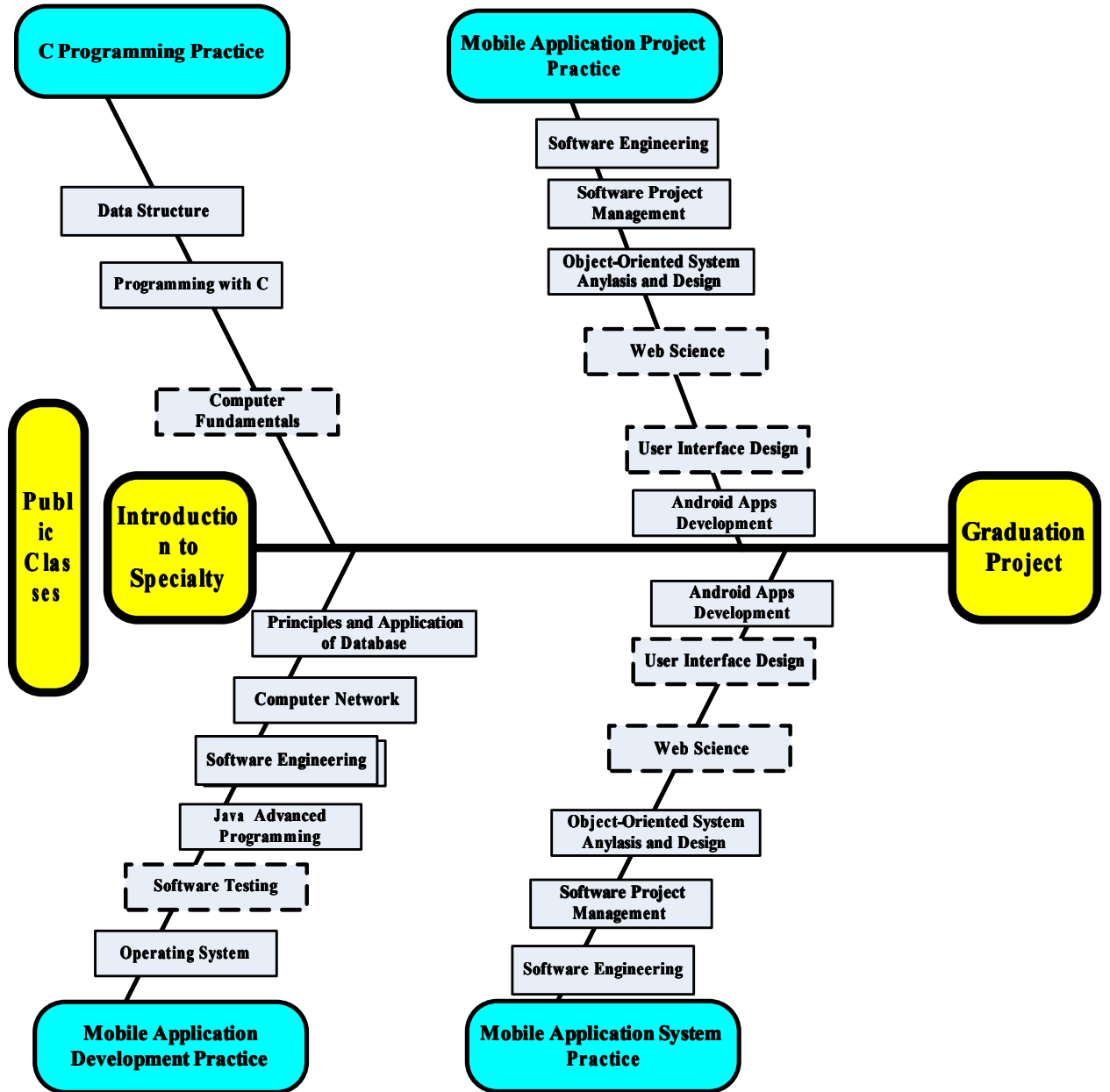
We aim to cultivate and grow future practice-oriented advanced personnel with excellent understanding of computer science, Internet and mobile communications. They will be able to develop and build mobile applications, analysis and design software systems. With enhanced personal comprehensive quality and professional competence, they will be capable of analyzing, designing, coding, testing and maintaining mobile application software.

3. TOPCARES-CDIO Outcome System (Student abilities specified)

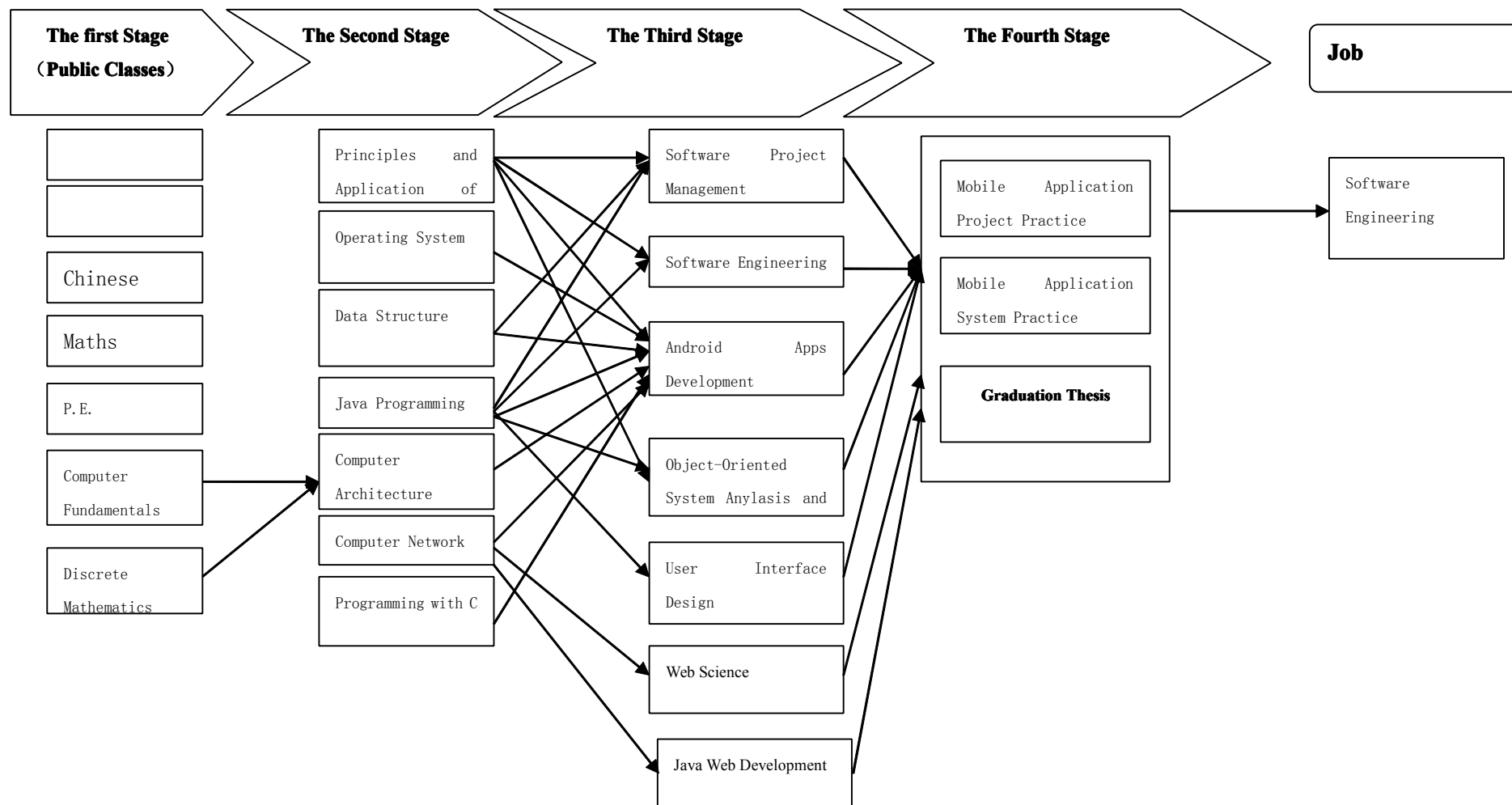
TOPCARES (Level 1)	TOPCARES (Level 2)
1. Technical knowledge and reasoning	1.1 Knowledge of underlying sciences
	1.2 Core engineering fundamental knowledge
	1.3 Advanced engineering fundamental knowledge
2. Open minded and innovation	2.1 Systematic Thinking
	2.2 Critical Thinking
	2.3 Creative Thinking
	2.4 Innovation ability
3. Personal and professional skills	3.1 Reasoning and problem solving
	3.2 Experimentation and knowledge discovery
	3.3 Information processing ability
	3.4 Time and Resource Management
	3.5 Curiosity and Lifelong Learning
4. Communication and teamwork	4.1 Communication strategy and structure
	4.2 Communications in foreign languages
	4.3 Teamwork
5. Attitude and manner	5.1 Professional Ethics, Integrity, Responsibility &

	Accountability
	5.2 Professional behavior
	5.3 Proactively Planning for One's Career
6. Responsibility	6.1 Roles and Responsibility of Engineers
7. Ethical values	7.1 Ethical standards and principles
8. Social contribution by application practice (CDIO)	8.1 External and societal context
	8.2 Enterprise and business context
	8.3 Industry application context
	8.4 Conceiving and engineering systems
	8.5 Designing
	8.6 Implementing
	8.7 Operating

Fishbone Diagram - Projects & Main Course



4. Courses Roadmap



5. Modules in Curriculum

The program mainly consists of three modules.

- Module one includes Chinese language/culture courses, mathematics which aim to enhance students' communicating abilities in Chinese and provide them a solid mathematical basis. This module will also pay special attention to Chinese and Qingchengshan Taoism culture after students enter into intermediate and high level of study. It will focus on the training in Chinese listening and speaking, Chinese-text reading, and Chinese practical writing.
- Module two is made up of fundamental and professional courses in order to give solid theory as well as practice experience to the students. Some projects are embedded in courses to give students chance to learn in practice. The courses include Data Structure, Computer Architecture, Computer Network, Software Engineering, Software Project Management, Java Programming, etc al. The projects is an opportunity for students to practice their communication and teamwork skills, and the ability to CDIO(conceive, design, implementation, operation) a product or system .
- Module three consists of various optional courses. Students can choose from a wide range of subjects including Chinese Tea Culture, arts, Mobie apps development(Android/iOS), User Interface Design etc al.
- Module Four: Project and thesis for the last year. Students will do some big project for 10 weeks. Then they will complete their theses for degree.

6. Courses Description

Discrete Mathematics

Course includes those mathematical topics which will help students in future courses. It refines problem solving skills by providing a vocabulary, structures and techniques for working with problems. Topics include logic, theorem proving, properties of sets, functions, relations and sequences, counting techniques, recursion and graph theory.

Programming with C

Teaches students basic programming concepts within a software engineering process. Programming coverage includes basic programming concepts such as the declaration and assignment of variables, standard data types, constants, conditional statements, loops, introduction to classes and methods, standard and file input/output, arrays, and strings.

Data Structure

Commonly used structures found in computing and the algorithms which manipulate them are studied. Design and analysis of algorithms are emphasized. Topics include stacks, queues, general lists, trees, hashing, searching, and sorting.

Computer Architecture

Studies the design and organization of computer systems, including the instruction set and interconnection of hardware components. Topics include computer performance, assembly language programming, microprocessor architecture, pipeline processing, memory and storage organization, and multiprocessor computers

Computer Network

Presents the fundamentals of data communications and networking technologies. Focuses on the broad foundational coverall of key technologies and key concepts in network planning, design, and management. Major topics include network models, data and voice communications, local-area and wide-area technologies, IP networks and their applications and internetworking emphasizing the Internet.

Principles and Application of Database

Studies concepts and applications in database management including the relational model, relational algebra, Structural Query Language (SQL), and application development. Students get a chance to develop a database application working in groups.

Operating System

I/O management, memory management, processor management, device management, and performance measurement/evaluation are examined. Other operating systems, theoretical and current, are discussed.

Software Engineering

Study of the principles, practices, and techniques used to gather system requirements and document them in a requirements specification. Includes techniques for requirements discovery such as user interviews and prototyping. Introduces approaches for organizing and expressing software requirements in a requirements specification.

Software Testing

Study of software quality assurance, software testing, and software maintenance processes, methods and techniques including formal review techniques, software verification, validation, and testing, types of software maintenance, maintenance activities, and regression testing.

Object-Oriented System Analysis and Design

The students will explain the relationship between models, software, and the real world, describe software systems in terms of models other than code, translate informal descriptions of software systems into structured textual and graphical models, create well-formed engineering models in informal notations and formal languages, evaluate the qualities of models and software systems, the process models for the big problem, apply patterns to solve problem effectively.

Software Project Management

The objective of this course is to study project management in the context of software systems development. The course will cover the processes, contexts, metrics, planning and management concerns of managing projects for modern software systems. This is a writing intensive course.

Java Programming

An introduction to problem-solving methods and programming techniques that can be applied to JAVA and other programming languages. The student will learn and use JAVA to construct efficient and easy to understand programs for engineers and scientific applications.

Java Advanced Programming

Introduces students to issues and practices for working with medium-size software systems. Students learn basic techniques for using application frameworks. Introduces students to software development in teams and provides an overview of the software engineering professional practice.

Web Science

This course is designed to give the student an understanding of the plumbing that makes the Web work. It covers basic and some advanced technologies currently being used in Web based systems, and provides an overview of the technical issues surrounding the Web. Students successfully completing this course will learn to employ Web technologies to build high-value web applications.