

PROPEL

Programme Objectives and Content

PROPEL has been designed to meet the requirements of the software industry for competent workforce. It prepares candidates to begin their career in this exciting field and develop themselves into successful professionals in the long term.

PROPEL focuses on holistic development of the participants. Keeping this in mind, the designers of PROPEL have given a balanced treatment of different areas such as technology, soft skills, language fluency, behavioural orientations and basic business knowledge. The programme enables participants to become professionals who solve real-world problems through the medium of software.

The total duration of the programme is 71 working days, divided into five 'Camps'. Each Camp has a major objective, and builds over the learning from the previous Camps. Camp 1 helps the participants to understand their future roles and to take charge of building their career. Camps 2 to 5 cover the major part of the content, with a project in each Camp.

The details of the five Camps are given below:

Camp 1 (3 days)

- Participants set targets to be achieved within a two year period, and commit to develop the knowledge, skills and orientations required to achieve them, taking personal responsibility while working in a collaborative environment.
- Participants prepare a case study on solving real-world problems using software.
- Participants and facilitators set norms for collaboratively creating the learning environment, to maximize learning in the subsequent camps.

Camp 2 (12 days)

Participants develop a software application applying the basic principles of programming and following a simple software development lifecycle model.

<p>Foundations of Programming in C</p> <ol style="list-style-type: none"> 1. Coding Standards 2. Variables and Data Types 3. Control Structures 4. Arrays 5. Functions 6. Structures and Unions 7. Pointers 8. File Handling <p>Data Structures</p> <ol style="list-style-type: none"> 1. Introduction to Data Structures 2. Stack 3. Queue 4. Linked List 5. Binary Tree 6. Sorting and searching 	<p>Software Engineering & Structured System Analysis and Design</p> <ol style="list-style-type: none"> 1. Context of Software Engineering 2. Software Engineering as a profession 3. Software Engineering Processes 4. Modeling 5. Software Development Life Cycle: Waterfall model, iteration and prototyping. 6. Artifacts: SRS, DFD, ER Diagram, Flow Chart, Pseudocode, Test Cases
<p>Soft Skills</p> <ol style="list-style-type: none"> 1. Assertiveness 2. Language practice 	<p>Seminars & Case Studies</p> <ol style="list-style-type: none"> 1. What CEOs and CTOs expect from Software Engineers. 2. Functioning of a typical IT organization, with profiles of different roles.

Camp 3 (12 days)

Participants develop a strong understanding of database by practice.

<p>SQL</p> <ol style="list-style-type: none"> 1. Introduction to Database 2. Normalization 3. DDL 4. DML 5. SELECT 6. Joins 7. Functions 8. Subqueries 9. TCL 	<p>PL/SQL</p> <ol style="list-style-type: none"> 1. Views, Indexes, Sequences and Synonyms 2. PLSQL Basics 3. Exception handling 4. Stored procedures and Functions 5. Cursors 6. Triggers 7. Performance tuning
<p>Soft Skills</p> <ol style="list-style-type: none"> 1. Dialogue skills 2. Presentation skills 3. Idea generation and decision making in groups 4. Language practice 	<p>Seminars & Case Studies</p> <ol style="list-style-type: none"> 1. Knowledge related to selected domains using case studies. 2. Concept reviews and practice sessions for Aptitude Tests

<h2>Camp 4 (24 days)</h2> <p>Participants develop a software application, using C#.Net or Java following the Unified Software Development Process.</p>	
<h3>Technology Specialization</h3>	
Option 1: C#	Option 2: Java
<ol style="list-style-type: none"> 1. Introduction to .Net 2. Introduction to C# <ul style="list-style-type: none"> ▪ Basics ▪ Console application ▪ Windows application ▪ IDE - Visual Studio 3. Object oriented programming using C# <ul style="list-style-type: none"> ▪ Class ▪ Polymorphism ▪ Inheritance 4. Creating Class Libraries 5. Memory Management 6. Properties 7. Indexers 8. Delegates and Events 9. Exception handling 10. Interface and Abstract Classes 11. Collections and Generics 12. ADO.Net 13. Files and Streams 14. Threading 15. Assemblies 16. Memory Management 	<ol style="list-style-type: none"> 1. Evolution of Java 2. Language Basics <ul style="list-style-type: none"> ▪ Data Types, Variables and Arrays ▪ Operators ▪ Control Statements 3. Object oriented programming using Java <ul style="list-style-type: none"> ▪ Classes and Encapsulation ▪ Polymorphism ▪ Inheritance 4. Packages, Abstract classes and Interfaces 5. Exception Handling 6. Multithreaded Programming 7. File handling and streams 8. Network Programming 9. Generics and Collections Framework 10. Abstract Window Toolkit and Event Handling 11. Swing 12. JDBC Objects 13. Remote Method Invocation
Soft Skills <ol style="list-style-type: none"> 1. Negotiation skills 2. Conflict resolution in different scenarios like prioritizing requirements, resource allocation, choosing between design options etc. 3. Language practice 	Software Engineering & Object Oriented Analysis and Design <ol style="list-style-type: none"> 1. Unified Software Development Process (USDP): Inception, Elaboration, Construction, Transition 2. Iterative Development 3. Actor and Use case, Use case Analysis 4. Design patterns 5. UML 6. Version Control
	Seminars & Case Studies <ol style="list-style-type: none"> 1. Knowledge related to selected domains using case studies. 2. Business and economic scenario and their impact on the IT sector. 3. Preparing for recruitment process (Resume preparation, interviews etc.) 4. Concept reviews and practice sessions for Aptitude Tests.

Camp 5 (20 days)

Participants develop a web-based application, using ASP.Net in C# or J2EE, following the Unified Software Development Process.

Technology Specialization

Option 1: ASP.Net	Option 2: J2EE
<ol style="list-style-type: none"> 1. Web Application 2. HTML and CSS 3. JavaScript 4. Web Controls 5. User Controls 6. Master pages 7. State Management 8. Three tier Architecture 9. XML and Serialization 10. Debugging 11. Tracing 12. Authentication and Authorization 13. Web Services 14. Configuration 15. Caching 16. Themes 	<ol style="list-style-type: none"> 1. Web Technology - Java Enterprise Edition Overview 2. HTML, CSS 3. JavaScript 4. Servlets 5. JSP (Java beans) 6. JSTL 7. EJB - Enterprise Java Beans 2.1 8. Spring 9. Hibernate 10. Struts 2.0 framework 11. XML 12. AJAX
Soft Skills <ol style="list-style-type: none"> 1. Interpersonal skills and emotional maturity 2. Leadership skills 3. Language practice 	Seminars & Case Studies <ol style="list-style-type: none"> 1. Professionalism & Ethics 2. Knowledge related to selected domains using case studies. 3. Business and economic scenario.