

# Postgraduate Diploma Language Processors



## Postgraduate Diploma Language Processors

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/in/information-technology/postgraduate-diploma/postgraduate-diploma-language-processors](http://www.techtute.com/in/information-technology/postgraduate-diploma/postgraduate-diploma-language-processors)

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# 01

# Introduction

With this professional program you will learn the latest trends and developments in Language Processors from leading industry experts. In this program you will learn in depth the essential theoretical mathematical concepts behind Computer Science, such as propositional logic, set theory and numerable and non-numerable sets.



“

*This Postgraduate Diploma will allow you to update your knowledge about Language Processors in a practical way, 100% online, without renouncing to the maximum academic rigor”*

This program is aimed at those interested in achieving a higher level of knowledge in Language Processors. The main objective of this Postgraduate Diploma is for students to specialize their knowledge in simulated work environments and conditions in a rigorous and realistic manner so that they can later apply it in the real world.

This Postgraduate Diploma will prepare students for the professional practice of Computer Engineering, thanks to a transversal and versatile academic experience adapted to new technologies and innovations in this field. You will obtain extensive knowledge in Language Processors, from professionals in the sector.

The students will be able to take the opportunity and study this program in a 100% online format, without neglecting their obligations. Update your knowledge and obtain a Postgraduate Diploma to continue growing both personally and professionally.

This **Postgraduate Diploma in Language Processors** contains the most complete and up-to-date program on the market. The most important features include:

- ◆ Development of 100 simulated scenarios presented by experts in Language Processors
- ◆ The graphical, schematic and eminently practical content of the software provides scientific and practical information on the Language Processors
- ◆ News on the latest developments in Language Processors
- ◆ Practical exercises where self-assessment can be used to improve learning
- ◆ Interactive learning system based on the case method and its application to real practice
- ◆ All of this will be complemented by theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ◆ Content that is accessible from any fixed or portable device with an internet connection



*This program will allow you to enhance your skills and update your knowledge in Language Processors”*

“

*Get qualified in Language Processors with this intensive program, from the comfort of your own home”*

It includes in its teaching staff a team of professionals belonging to the field of Computer Engineering, who bring to this training the experience of their work, in addition to recognized specialists belonging to reference societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide an immersive program designed to train in real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise throughout the program. For this purpose, the professionals will be assisted by an innovative interactive video system created by recognized experts in Information System with extensive teaching experience.

*Take advantage of the latest educational technology to get up to date in Language Processors without leaving home.*

*Learn about the latest techniques in Language Processors from experts in the field.*



# 02

# Objectives

The objective of this program is to provide IT professionals with the knowledge and skills necessary to carry out their activity using the most advanced protocols and techniques of the moment. Through a work approach that is totally adaptable to the students, this Postgraduate Diploma will progressively lead them to acquire the competencies that will propel them to a higher professional level.

```
custom: function(a, b) {  
  var c = b.options.custom[a.arg],  
      d = new RegExp(c.pattern);  
  return d.test(a.val) || c.errorMessage  
},  
function(a) {
```



```
|| g.maxSelected.replace("}count}", 4.400)
|| g.minSelected.replace("}count}", 4.400)
pe=radio][name=" + b.name + "}]").filter("checked").length
```

“

*Achieve professional success as an IT professional with this intensive program, developed by professionals with extensive experience in the sector”*



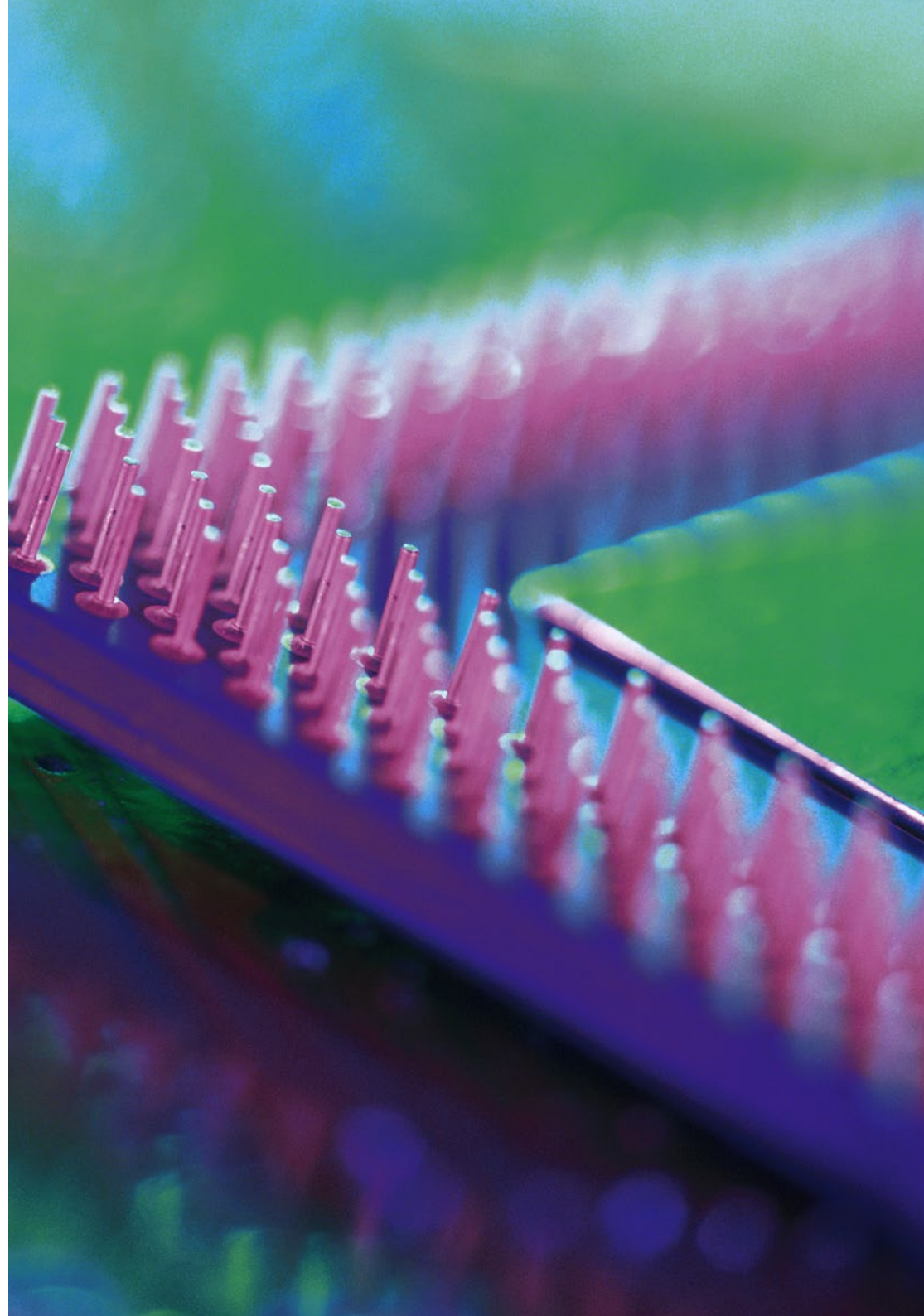
## General Objectives

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- ◆ To prepare scientifically and technologically, as well as to develop the professional practice of software engineering, with a transversal and versatile approach adapted to the new technologies and innovations in this field
- ◆ To obtain wide knowledge in the field of computer engineering, structure of computers and Software Engineering including the mathematical, statistical and physical basis which is essential in Engineering



*Enroll in the best Language Processor program on the university scene today”*





## Specific Objectives

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### Module 1. Theoretical Computer Science

- ◆ To understand the essential theoretical mathematical concepts behind Computer Science, such as propositional logic, set theory and numerable and non-numerable sets
- ◆ To understand the concepts of formal languages and grammars, as well as Turing machines in their different variants
- ◆ To learn about the different types of undecidable problems and intractable problems, including the different variants of them and their approaches
- ◆ To understand the operation of different kinds of randomization-based languages and other kinds of classes and grammars
- ◆ To learn about other advanced computing systems such as membrane computing, DNA computing and quantum computing

### Module 2. Automata Theory and Formal Languages

- ◆ To understand the theory of automata and formal languages, learning the concepts of alphabets, strings and languages, as well as how to perform formal demonstrations
- ◆ To delve into the different types of finite automata, both deterministic and non-deterministic
- ◆ To learn the basic and advanced concepts related to regular languages and regular expressions, as well as the application of the pumping lemma and the closure of regular languages
- ◆ To understand context-independent grammars and the operation of stack automata
- ◆ To delve into normal forms, the pumping lemma of context-independent grammars and properties of context-independent languages

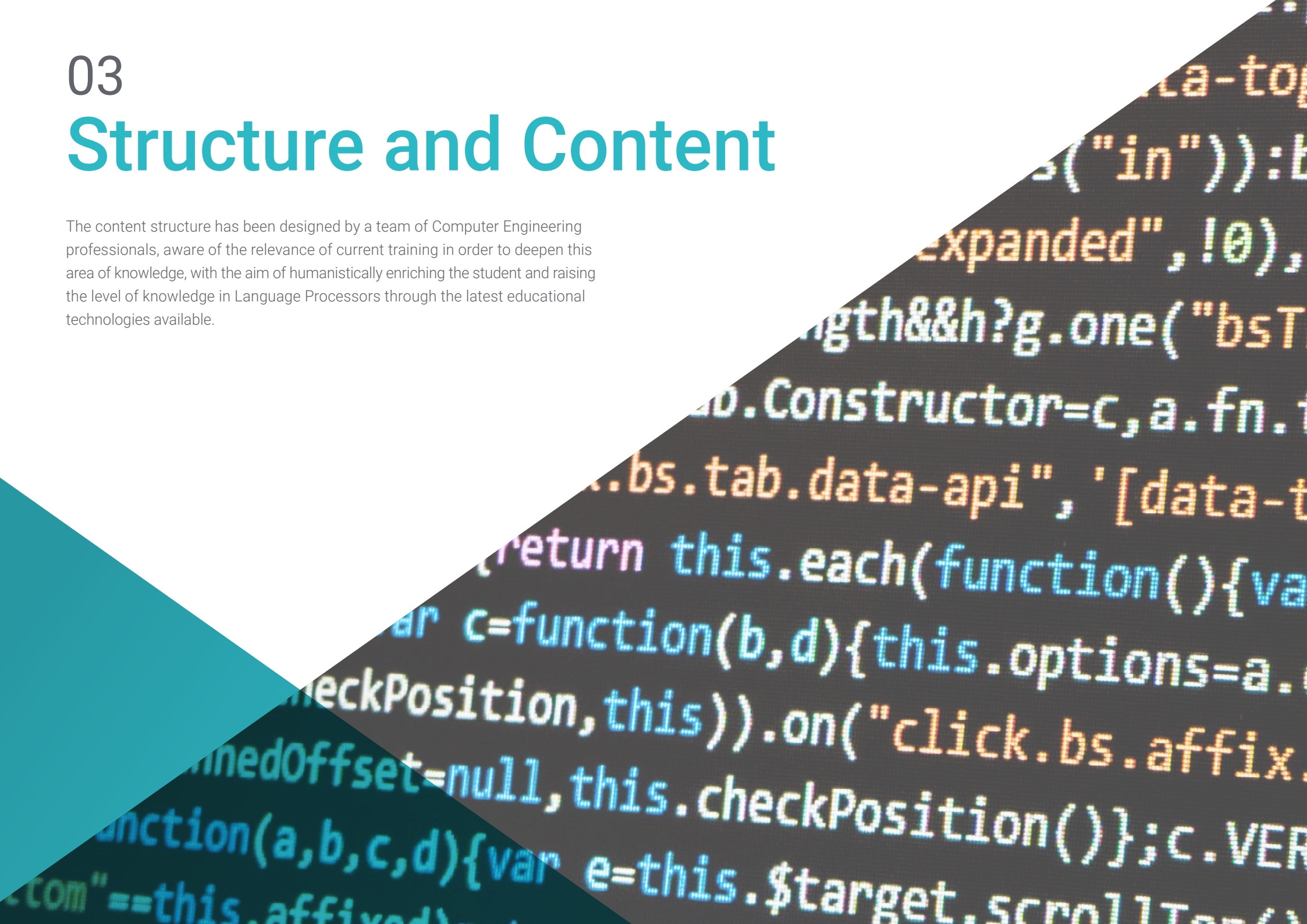
### Module 3. Language Processors

- ◆ To introduce the concepts related to the compilation process and the different types of analysis: lexical, syntactic and semantic
- ◆ To learn how a lexical analyzer works, its implementation and error recovery
- ◆ To delve into the knowledge of syntactic analysis, both top-down and bottom-up, but with special emphasis on the different types of bottom-up syntactic parsers
- ◆ To understand the functioning of semantic parsers, the syntax-driven tradition, the symbol table and the different types
- ◆ To learn the various mechanisms for code generation, both in runtime environments and for intermediate code generation
- ◆ To lay the groundwork for code optimization, including expression reordering and loop optimization

03

# Structure and Content

The content structure has been designed by a team of Computer Engineering professionals, aware of the relevance of current training in order to deepen this area of knowledge, with the aim of humanistically enriching the student and raising the level of knowledge in Language Processors through the latest educational technologies available.





*This Postgraduate Diploma in Language Processors contains the most complete and up-to-date learning program on the market"*

## Module 1. Theoretical Computer Science

- 1.1. Mathematical Concepts Used
  - 1.1.1. Introduction to Propositional Logic
  - 1.1.2. Theory of Relations
  - 1.1.3. Numerable and Non-Numerable Sets
- 1.2. Formal Languages and Grammars and Introduction to Turing Machines
  - 1.2.1. Formal Languages and Grammars
  - 1.2.2. Decision Problem
  - 1.2.3. The Turing Machine
- 1.3. Extensions to Turing Machines, Constrained Turing Machines and Computers
  - 1.3.1. Programming Techniques for Turing Machines
  - 1.3.2. Extensions for Turing Machines
  - 1.3.3. Restricted Turing Machines
  - 1.3.4. Turing Machines and Computers
- 1.4. Indecibility
  - 1.4.1. Non-Recursively Enumerable Language
  - 1.4.2. A Recursively Enumerable Undecidable Problem
- 1.5. Other Undecidable Problems
  - 1.5.1. Undecidable Problems for Turing Machines
  - 1.5.2. Post Correspondence Problem (PCP)
- 1.6. Intractable Problems
  - 1.6.1. The Classes P and NP
  - 1.6.2. A NP-Complete Problem
  - 1.6.3. Restricted Satisfiability Problem
  - 1.6.4. Other NP-Complete Problems
- 1.7. Co-NP and PS Problems
  - 1.7.1. Complementary to NP Languages
  - 1.7.2. Problems Solvable in Polynomial Space
  - 1.7.3. Complete PS Problems





- 1.8. Classes of Randomization-Based Languages
  - 1.8.1. MT Model with Randomization
  - 1.8.2. RP and ZPP Classes
  - 1.8.3. Primality Test
  - 1.8.4. Complexity of The Primality Test
- 1.9. Other Classes and Grammars
  - 1.9.1. Probabilistic Finite Automata
  - 1.9.2. Cellular Automata
  - 1.9.3. McCulloch and Pitts Cells
  - 1.9.4. Lindenmayer Grammars
- 1.10. Advanced Computing Systems
  - 1.10.1. Membrane Computing: P-Systems
  - 1.10.2. DNA Computing
  - 1.10.3. Quantum Computing

## Module 2. Automata Theory and Formal Languages

- 2.1. Introduction to Automata Theory
  - 2.1.1. Why Study Automata Theory?
  - 2.1.2. Introduction to Formal Demonstrations
  - 2.1.3. Other Forms of Demonstration
  - 2.1.4. Mathematical Induction
  - 2.1.5. Alphabets, Strings and Languages
- 2.2. Deterministic Finite Automata
  - 2.2.1. Introduction to Finite Automata
  - 2.2.2. Deterministic Finite Automata
- 2.3. Non-Deterministic Finite Automata
  - 2.3.1. Non-Deterministic Finite Automata
  - 2.3.2. Equivalence Between AFD and AFN
  - 2.3.3. Finite automata with transitions  $\epsilon$

- 2.4. Languages and Regular Expressions I
  - 2.4.1. Languages and Regular Expressions
  - 2.4.2. Finite Automata and Regular Expressions
- 2.5. Languages and Regular Expressions II
  - 2.5.1. Conversion of Regular Expressions into Automata
  - 2.5.2. Applications of Regular Expressions
  - 2.5.3. Algebra of Regular Expressions
- 2.6. Pumping and Closure Lemma of Regular Languages
  - 2.6.1. Pumping Lemma
  - 2.6.2. Closure Properties of Regular Languages
- 2.7. Equivalence and Minimization of Automata
  - 2.7.1. FA Equivalence
  - 2.7.2. AF Minimization
- 2.8. Context-Independent Grammars (CIGs)
  - 2.8.1. Context-Independent Grammars
  - 2.8.2. Derivation Trees
  - 2.8.3. GIC applications
  - 2.8.4. Ambiguity in Grammars and Languages
- 2.9. Stack Automata and GIC
  - 2.9.1. Definition of Stack Automata
  - 2.9.2. Languages Accepted by a Stack Automaton
  - 2.9.3. Equivalence between Stack Automata and GICs
  - 2.9.4. Deterministic Stack Automata
- 2.10. Normal Forms, Pumping Lemma of GICs and Properties of LICs
  - 2.10.1. Normal Forms of GICs
  - 2.10.2. Pumping Lemma
  - 2.10.3. Closure Properties of Languages
  - 2.10.4. Decision Properties of LICs

```
// text runs across the top  
// persisted properties  
<html> <p style="font-weight:bold;"  
<html> <body style="background-co  
<html>text - :200px;" <.todolistid =  
// Non - text - :200px;">persiste  
<html> <errorMessage = ko , o  
<p style="color:orange;">HTML  
function todoitem(data)  
  var self = this <html  
  data = dta 11 <html>  
// Non - persisted propertie  
<html> <errorMessage = text -  
<p style="font-weight:bold;">HTML  
<body style="background-color:y  
text - :200px;" <.todolistid = dat  
- text - :200px;">persisted p  
= ko obse
```



## Module 3. Language Processors

- 3.1. Introduction to the Compilation Process
  - 3.1.1. Compilation and Interpretation
  - 3.1.2. Compiler Execution Environment
  - 3.1.3. Analysis Process
  - 3.1.4. Synthesis Process
- 3.2. Lexical Analyzer
  - 3.2.1. What is a Lexical Analyzer?
  - 3.2.2. Implementation of the Lexical Analyzer
  - 3.2.3. Semantic Actions
  - 3.2.4. Error Recovery
  - 3.2.5. Implementation Issues
- 3.3. Parsing
  - 3.3.1. What is a Parser?
  - 3.3.2. Previous Concepts
  - 3.3.3. Top-Down Analyzers
  - 3.3.4. Bottom-Up Analyzers
- 3.4. Top-Down Parsing and Bottom-Up Parsing
  - 3.4.1. LL Analyzer (1)
  - 3.4.2. LR Analyzer (0)
  - 3.4.3. Analyzer Example
- 3.5. Advanced Bottom-Up Parsing
  - 3.5.1. SLR Parser
  - 3.5.2. LR Parser (1)
  - 3.5.3. LR Analyzer (k)
  - 3.5.4. LALR Parser
- 3.6. Semantic Analysis I
  - 3.6.1. Syntax-Driven Translation
  - 3.6.2. Table of Symbols
- 3.7. Semantic Analysis II
  - 3.7.1. Type Checking
  - 3.7.2. The Type Subsystem
  - 3.7.3. Type Equivalence and Conversions
- 3.8. Code Generation and Execution Environment
  - 3.8.1. Design Aspects
  - 3.8.2. Execution Environment
  - 3.8.3. Memory Organization
  - 3.8.4. Memory Allocation
- 3.9. Intermediate Code Generation
  - 3.9.1. Synthesis-Driven Translation
  - 3.9.2. Intermediate Representations
  - 3.9.3. Examples of Translations
- 3.10. Code Optimization
  - 3.10.1. Register Allocation
  - 3.10.2. Elimination of Dead Assignments
  - 3.10.3. Compile-Time Execution
  - 3.10.4. Expression Reordering
  - 3.10.5. Loop Optimization



*A unique, key, and decisive educational experience to boost your professional development*

# 04

# Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning**.

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.



“

*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

“

*At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world”*



*You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.*



*The student will learn to solve complex situations in real business environments through collaborative activities and real cases.*

### A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

“*Our program prepares you to face new challenges in uncertain environments and achieve success in your career”*

The case method has been the most widely used learning system among the world's leading Information Technology schools for as long as they have existed. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the course, students will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

## Relearning Methodology

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

*In 2019, we obtained the best learning results of all online universities in the world.*

At TECH you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.



In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

*Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.*

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.



This program offers the best educational material, prepared with professionals in mind:



### Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



### Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



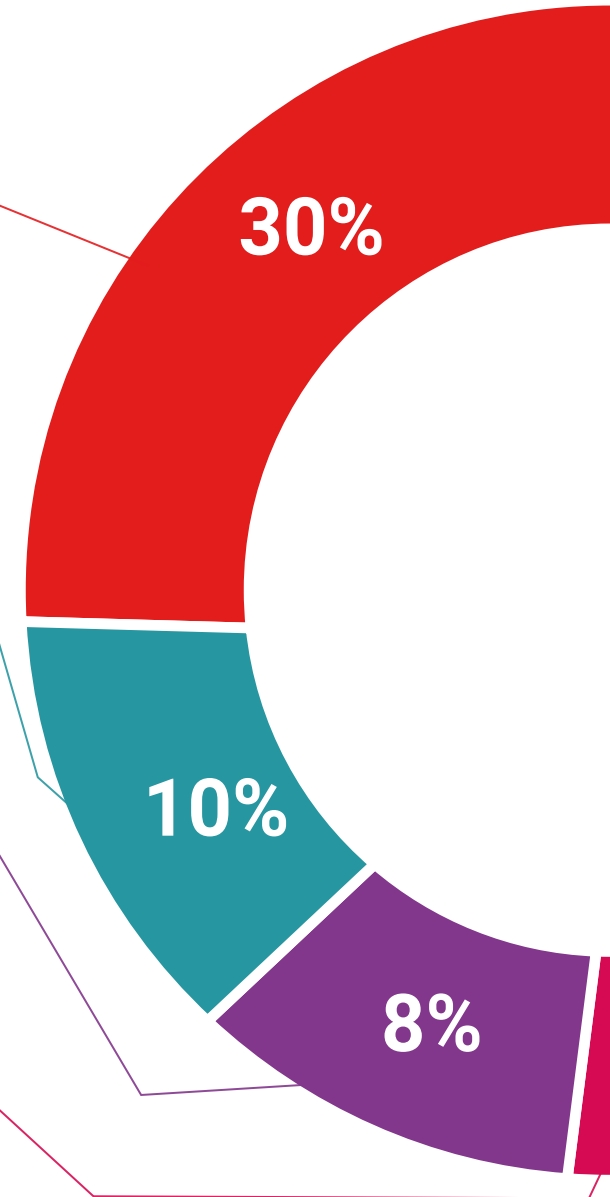
### Practising Skills and Abilities

They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.







#### Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.



#### Interactive Summaries

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.



# 05 Certificate

The Postgraduate Diploma in Language Processors guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.





*Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"*

This **Postgraduate Diploma in Language Processors** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Diploma** issued by **TECH Technological University** via tracked delivery\*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Diploma in Language Processors**

Official N° of Hours: **450 h.**



\*Apostille Convention. In the event that the student wishes to have their paper certificate issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present  
online training  
development language  
classroom



## Postgraduate Diploma Language Processors

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# Postgraduate Diploma Language Processors

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...index.html">Home</a>  
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