

Postgraduate Certificate Catalytic Reactor Design



Postgraduate Certificate Catalytic Reactor Design

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

Website: www.techtute.com/pk/engineering/postgraduate-certificate/catalytic-reactor-design

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01

Introduction

The Chemical Industry, in the search for improving the efficiency, selectivity, and speed of chemical reactions, has focused its efforts on research aimed at meeting these goals and obtaining catalysts that allow the conversion of renewable raw materials. In this sense, the profile of the chemical engineer is of great value, given his knowledge and capabilities to solve the main problems in this field. In this sense, to contribute to professional development, TECH launches this 100% online program that will allow high school students to achieve high learning rates around the techniques and tools they need to design catalytic reactors. All this, with high-quality multimedia teaching resources and a syllabus prepared by experts in this area.





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A 100% online Postgraduate Certificate that will bring you up-to-date on Catalytic Reactor Design with the most rigorous content"

Research into the development of more efficient chemical processes, maximizing the conversion of chemical reactions and minimizing energy requirements and waste production are key in the Chemical Industry. A reality that has allowed the improvement of techniques and tools in the design of chemical reactors.

In this sense, given its relevance, the Chemical Engineering professional must be aware of the latest scientific evidence, in addition to mastering chemical kinetics or the different mathematical models used. In view of this scenario, TECH has decided to create this Postgraduate in Catalytic Reactor Design of 6 weeks duration and with 150 teaching hours.

A syllabus that will allow the high school students to delve into the most used catalytic reactors in the current industry such as fixed bed and fluidized bed reactors, the design of specific reactors such as electrochemical reactors, bioreactors and photoreactors and to determine the main applications of these reactors in environmental matters. All this, in addition, with pedagogical resources based on video summaries, in-focus videos, specialized readings and case studies.

Furthermore, the Relearning method, based on the reiteration of content, will allow the graduate to consolidate the concepts addressed in a simple way and without the need to invest long hours of study and memorization.

Undoubtedly, a unique learning opportunity through an educational proposal that stands out for its flexibility. Students only need a digital device with an Internet connection to visualize, at any time, the contents hosted on the virtual platform. A methodology that makes it possible to combine work and personal daily activities with quality education.

This **Postgraduate Certificate in Catalytic Reactors Design** contains the most complete and up-to-date program on the market. The most important features include:

- ♦ The development of practical cases presented by experts in Chemistry Engineering
- ♦ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- ♦ Practical exercises where self-assessment can be used to improve learning
- ♦ Its special emphasis on innovative methodologies
- ♦ 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



Do you want to get advanced learning in Catalytic Reactor Design at any time of the day? Do it through this TECH Postgraduate Certificate"

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An educational proposal that will lead you to explore innovative applications in membrane reactors and photoreactors"

The Relearning system allows you to consolidate the concepts addressed in a natural way and without great study efforts.

Examine the design of the most widely used catalytic reactors in the industry thanks to the best multimedia teaching material.

The program's teaching staff includes professionals from the field who contribute their work experience to this educational program, as well as renowned specialists from leading 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 immersive education programmed to learn 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 during the educational year. For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts



02 Objectives

TECH puts all its efforts in facilitating the high school students to learn how to improve their skills, competences and knowledge in Catalytic Reactor Design. To achieve this learning successfully, this educational institution provides the graduate with a syllabus that presents a theoretical-practical approach, complemented with case study simulations and a wide variety of pedagogical resources. A unique opportunity offered only by the world's largest digital university.



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Analyzes the effect of fluidization and the models that define it in fluidized bed reactors through an intensive and advanced syllabus "



General Objectives

- ◆ Explore innovative applications of chemical reactors
- ◆ Promote the integration of theoretical and practical aspects of chemical reactor design



*Boost your skills to design bioreactors
based on the mode of operation"*





Specific Objectives

- ◆ Apply mathematical models for the design of fixed-bed reactors with different technical specifications
- ◆ Analyze the effect of fluidization and the models that define it in fluidized bed reactors
- ◆ Design specific columns for fluid-fluid specifications
- ◆ Evaluate the influence of configuration on the design of electrochemical reactors
- ◆ Explore innovative applications in membrane reactors and photoreactors
- ◆ Examine the different configurations for gasification reactors
- ◆ Optimize bioreactor design based on the mode of operation
- ◆ Selecting appropriate reactors for different polymerization processes

03

Course Management

In order to offer quality and cutting-edge teaching, TECH has brought together in this university program a faculty that is distinguished by its deep knowledge of the chemical industry and scientific research. In this way, the high school students have the guarantee of accessing a program that will provide them with the learning they need to grow professionally in the sector with a syllabus prepared by real specialists.



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*This is a university program prepared
by experts in the chemical industry and
in Inorganic Chemistry and Catalysis"*

Management



Dr. Barroso Martín, Isabel

- ♦ Expert in Inorganic Chemistry, Crystallography and Mineralogy
- ♦ Postdoctoral researcher of the I Own Research and Transfer Plan of the University of Málaga
- ♦ Research Staff at the University of Málaga
- ♦ ORACLE Programmer in CMV Consultants Accenture
- ♦ PhD in Sciences from the University of Málaga
- ♦ Master's Degree in Applied Chemistry - specialization in materials characterization - from the University of Málaga
- ♦ Master's Degree in SE, High School, Vocational Training, and Language Teaching - specializing in Physics and Chemistry University of Malaga

Professors

Dr. Torres Liñán, Javier

- ♦ Expert in Chemical Engineering and Associated technologies
- ♦ Specialist in Environmental Chemical Technology
- ♦ Collaborator of the Chemical Engineering Department of the University of Málaga
- ♦ PhD from the University of Málaga in the PhD program of Chemistry and Chemical Technologies, Materials, and Nanotechnology
- ♦ Master's Degree in ESO, High School, Form. Prof. and Language Teaching. Esp. Physics and Chemistry from the University of Málaga
- ♦ Master's Degree in Chemical Engineering from the University of Málaga



04

Structure and Content

The syllabus of this Postgraduate Certificate has been designed to offer high school students an effective learning process in only 6 weeks and through numerous teaching materials. In this way, the graduate will deepen in the design of specific reactors, in the techniques and tools for the design of functional chemical reactors in processes of great industrial interest and their application in diverse contexts. All this will lead the graduates to obtain an education that will increase their professional growth possibilities within the sector.





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*A syllabus designed to provide
you with the most advanced
information on Chemical Reactors”*

Module 1. Advanced Chemical Reactor Design

- 1.1. Reactor Design
 - 1.1.1. Kinetics of Chemical Reactions
 - 1.1.2. Reactor Design
 - 1.1.3. Simple Reaction Design
 - 1.1.4. Multiple Reaction Design
- 1.2. Fixed Bed Catalytic Reactors
 - 1.2.1. Mathematical Models for Fixed-Bed Reactors
 - 1.2.2. Fixed Bed Catalytic Reactor
 - 1.2.3. Adiabatic Reactor with and without Recirculation
 - 1.2.4. Non Adiabatic Reactors
- 1.3. Fluidized-Bed Catalytic Reactors
 - 1.3.1. Gas-Solid Systems
 - 1.3.2. Fluidization Regions
 - 1.3.3. Fluidized Bed Bubble Models
 - 1.3.4. Reactor Models for Fine and Large Particles
- 1.4. Fluid-Fluid Reactors and Multiphase Reactors
 - 1.4.1. Design of Infill Columns
 - 1.4.2. Design of Gushing Columns
 - 1.4.3. Multiphase Reactor Applications
- 1.5. Electrochemical Reactors
 - 1.5.1. Overpotential and Electrochemical Reaction Rate
 - 1.5.2. Influence on the Geometry of Electrodes
 - 1.5.3. Modular Reactors
 - 1.5.4. Model of Electrochemical Reactor Piston Flow
 - 1.5.5. Model of Electrochemical Reactor Perfect Mixing
- 1.6. Membrane Reactors
 - 1.6.1. Membrane Reactors
 - 1.6.1.1. According to Membrane Position and Reactor Configuration
 - 1.6.2. Membrane Reactors Applications
 - 1.6.3. Design of Membrane Reactors for the Production of Hydrogen
 - 1.6.4. Membrane Bioreactors





- 1.7. Photoreactors
 - 1.7.1. The Photoreactors
 - 1.7.2. Photoreactor Applications
 - 1.7.3. Photoreactor Design for Pollutant Removal
- 1.8. Gasification and Combustion Reactors
 - 1.8.1. Design of Fixed Bed Gasifiers
 - 1.8.2. Design of Fluidized Bed Gasifiers
 - 1.8.3. Drag-Flow Gasifiers
- 1.9. Bioreactors
 - 1.9.1. Bioreactors by Mode of Operation
 - 1.9.2. Design of a Batch Bioreactor
 - 1.9.3. Design of a Continuous Bioreactor
 - 1.9.4. Design of a Semicontinuous Bioreactor
- 1.10. Polymerization Reactors
 - 1.10.1. Polymerization Process
 - 1.10.2. Anionic Polymerization Reactors
 - 1.10.3. Staged Polymerization Reactors
 - 1.10.4. Free Radical Polymerization Reactors



Delve into the different types of polymerization reactors from your computer with an Internet connection"

05 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.





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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.

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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 is the most widely used learning system in the best faculties in the world. 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 program, the studies 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 8 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.

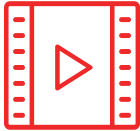
Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.

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.



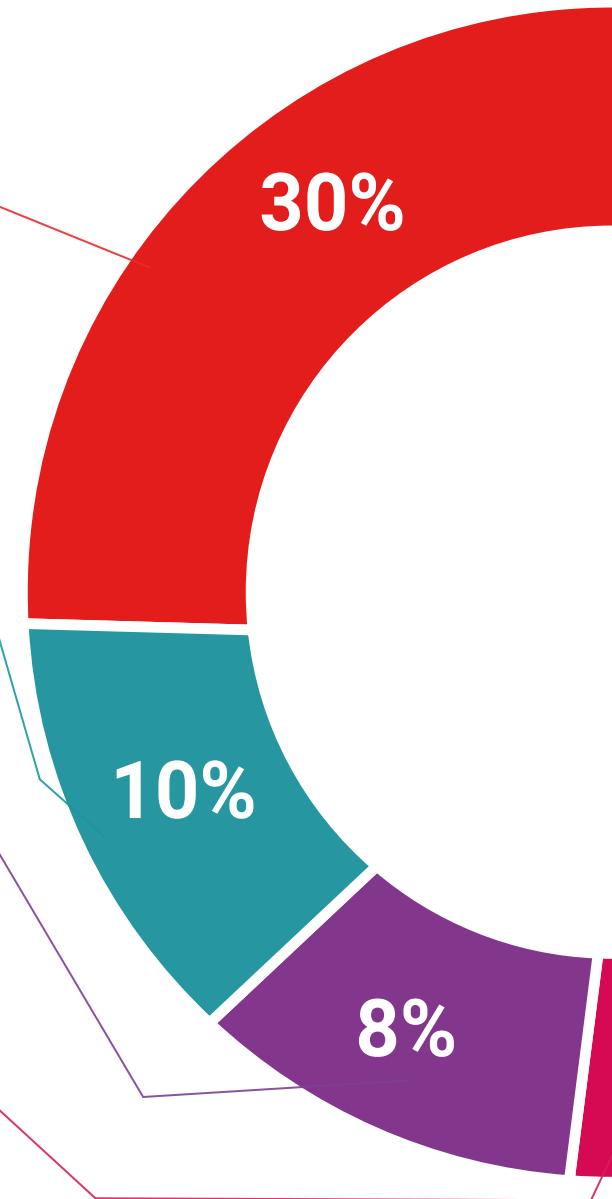
Practising Skills and Abilities

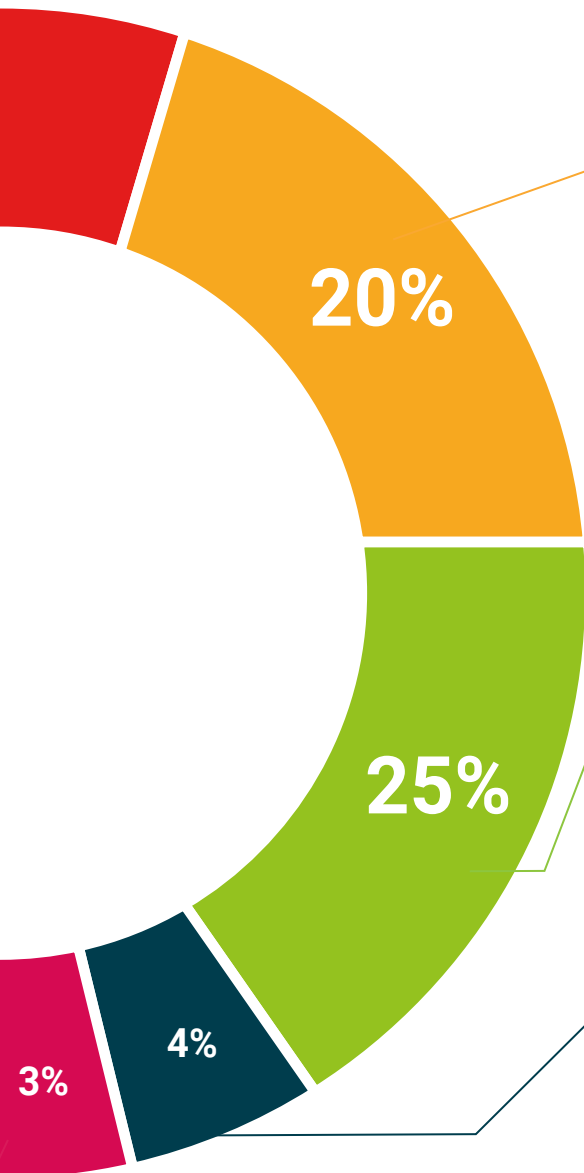
They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



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.



06 Certificate

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



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

This **Postgraduate Certificate in Catalytic Reactors Design** 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 Certificate** issued by **TECH Technological University** via tracked delivery*.

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

Title: **Postgraduate Certificate in Catalytic Reactors Design**

Official N° of Hours: **150 h.**



future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

personalized service innovation

knowledge present quality

online training

development languages

virtual classroom



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