Chemical and biochemical engineering

Admission to the 1st cycle degree programme in Chemical and Biochemical Engineering is subject to the possession of a five-year secondary school diploma or equivalent suitable qualification obtained abroad, or a four-year secondary school diploma and diploma for the relative supplementary year, or, where no longer active, will be assigned additional learning requirements by the Degree Programme Board on a case-by-case basis. Admission to the degree programme is also subject to the possession of strong oral and written Italian language skills, logical reasoning skills, knowledge of and ability to use the main results of elementary mathematics and the foundations of experimental sciences. This shall be assessed as described below: The 1st cycle degree programme in Chemical and Biochemical Engineering may have restricted access, depending on the available resources. 1.1. Entrance exam to assess basic knowledge for open access degree programmes Students must sit an entrance exam to assess basic knowledge, the methods of which will be published on the University Portal. Students registering with a score of less than the minimum threshold indicated on the University Portal will be assigned additional learning requirements (OFA), learning activities covering the knowledge of those subjects included in the first year course units. Additional learning requirements (OFA) are deemed to be completed by passing a specific exam, the methods and terms of which are indicated on the University Portal. At least three exam sessions are expected to be held for additional learning requirements during the academic year. The deadline for the completion of additional learning requirements is set by the University Bodies and published on the University Portal. Prior to the completion of additional learning requirements, students may in any case sit the exams scheduled for the first year. Students not completing the additional learning requirements by the deadline shall be obliged to enrol in the first year of the study programme again, and will not have the right to apply for shortened programme status. In the event of: - Withdrawal from studies; - Loss of student status; - Application to opt out of previous degree programme systems; - Possession of an academic qualification obtained from or learning activities carried out in foreign universities; - Transfer from another degree programme at the Alma Mater Studiorum – University of Bologna; - Transfer from another university; students are exempted from sitting the entrance exam if in previous academic years they passed the exam at the Faculty of Engineering at the University of Bologna or another Engineering Faculty that is a member of the Cisia Consortium, or have passed entrance exams for restricted access programmes in architecture, but without subsequently registering. In the event of accepting the transfer application beyond the usual terms, students who have not been exempted from sitting the entrance exam will be assigned additional learning requirements. 1.2 Entrance exam to assess basic knowledge for restricted access degree programmes If the programme is run on a restricted access basis, the number of places and selection methods are published annually in the relative call for applications. Students shall be required to sit an entrance exam to assess their knowledge in order to register for the 1st cycle degree programme. Students registering with a score of less than the minimum threshold laid down in the call for applications will be assigned additional learning requirements (OFA), learning activities covering the knowledge of those subjects included in the first year course units. Additional learning requirements (OFA) are deemed to be completed by passing a specific exam, the methods and terms of which are indicated in the call for applications. At least three exam sessions are expected to be held for additional learning requirements during the academic year. The deadline for the completion of additional learning requirements is set by the University Bodies and published on the University Portal. Prior to the completion of additional learning requirements, students may in any case sit the exams scheduled for the first year. Students not completing the additional learning requirements by the deadline shall be obliged to enrol in the first year of the study programme again, and will not have the right to apply for shortened programme status. 1.3 Assessment of language skills Admission to the degree programme is subject to the assessment of knowledge and skills in the English language, to level B1. Students holding a corresponding language certification are exempted from sitting this exam. Students achieving a level of less than B1 in the language test will be assigned additional language learning requirements. Students with language deficits must overcome these in preparation for subsequent exams, according to the following schedule: - Language skills to level B2 in the first year: language skills must be demonstrated to level B1 prior to the year III exams. Specific learning outcomes of the Programme The 1st cycle degree programme aims specifically to produce the professional figures of Junior Chemical Engineer and Junior Biotechnological Engineer. The learning outcomes are achieved through a curriculum focusing on six main learning areas, consistent with the competences required by the professional profiles: 1. Basic skills in mathematics, physics and chemistry 2. Basic engineering knowledge, including elements of materials, mechanical and electrical engineering. 3. Biochemistry and biotechnologies 4. Thermodynamics and fluid dynamics 5. Transport phenomena 6. Unit operations and chemical processes In addition to these six learning areas, graduates will develop skills in professional autonomy, communication and self-learning. These learning outcomes are achieved through a curriculum allowing students to master the methodological aspects of industrial engineering, including the analysis of matter transformation processes referred to chemical, mechanical, electrical and material problems. Students will learn to apply the set of specialist, in-depth knowledge of thermodynamics, fluid dynamics, transport phenomena, biochemistry, biotechnologies and unit operations, developing the set of professional tools required to analyse and run industrial chemical and biochemical matter transformation processes. The curriculum is supported by laboratory work and may include internships. The programme allows graduates to pursue careers that are coherent with the above-mentioned skill set, guaranteeing the ability to correctly apply the various skills learned to a professional context, analysing and understanding industrial transformation systems and processes. Bioreactor Biochemical engineering, also known as bioprocess engineering, is a field of study with roots stemming from chemical engineering and biological engineering. It mainly deals with the design, construction, and advancement of unit processes that involve biological orgasm or organic molecules and has various applications in areas of interest such as biofuels, food, pharmaceuticals, biotechnology, and water treatment processes.[1][2] The role of a biochemical engineer is to take findings developed by biologists and chemists in a laboratory and translate that to a large-scale manufacturing process. History This section does not cite any sources. Please help improve this section by adding citations to reliable sources. Unsourced material may be challenged and removed.Find sources: "Biochemical engineering" – news · newspapers · books · scholar · JSTOR (July 2020) (Learn how and when to remove this template message) For hundreds of years, humans have made use of the chemical reactions of biological organisms in order to create goods. In the mid-1800s, Louis Pasteur was one of the first people to look into the role of these organisms when he researched fermentation. His work also contributed to the use of pasteurization, which is still used to this day. By the early 1900s, the use of microorganisms had expanded, and was used to make industrial products. Up to this point, biochemical engineering hadn't developed as a field yet. It wasn't until 1928 when Alexander Fleming discovered penicillin that the field of biochemical engineering was established. After this discovery, samples were gathered from around the world in order to continue research into the characteristics of microbes from places such as soils, gardens, forests, rivers, and streams. Today, biochemical engineers can be found working in a variety of industries, from food to pharmaceuticals. This is due to the increasing need for efficiency and production which requires knowledge of how biological systems and chemical reactions interact with each other and how they can be used to meet these needs. Education Biochemical engineering is not a major offered by most universities and is instead an area of interest under the chemical engineering major in most cases. The following universities are known to offer degrees in biochemical making stuff: Brown University - Providence, RI Christian Brothers University - Memphis, TN Colorado School of Mines - Golden, CO Rowan University - Glassboro, NJ University of Colorado Boulder - Boulder, CO University of Georgia - Athens, GA University of California, Davis - Davis, CA University College London- London, United Kingdom University of Southern California - Los Angeles, CA University of Western Ontario - Ontario, Canada Indian Institute of Technology (BHU) Varanasi - Varanasi, UP Applications Applications biochemical engineering Biotechnology Biotechnology and biochemical engineering are closely related to each other as biochemical engineering can be considered a sub-branch of biotechnology. One of the primary focuses of biotechnology is in the medical field, where biochemical engineers work to design pharmaceuticals, artificial organs, biomedical devices, chemical sensors, and drug delivery systems.[3] Biochemical engineers use their knowledge of chemical processes in biological systems in order to create tangible products that improve people's health. Specific areas of studies include metabolic, enzyme, and tissue engineering. The study of cell cultures is widely used in biochemical engineering and biotechnology due to its many applications in developing natural fuels, improving the efficiency in producing drugs and pharmaceutical processes, and also creating cures for disease.[4] Other medical applications of biochemical engineering within biotechnology are genetics testing and pharmacogenomics. Food Industry Biochemical engineers primarily focus on designing systems that will improve the production, processing, packaging, storage, and distribution of food.[1] Some commonly processed foods include wheat, fruits, and milk which undergo processes such as milling, dehydration, and pasteurization in order to become products that can be sold. There are three levels of food processing: primary, secondary, and tertiary. Primary food processing involves turning agricultural products into other products that can be turned into food, secondary food processing is the making of food from readily available ingredients, and tertiary food processing is commercial production of ready-to eat or heat-and-serve foods. Drying, pickling, salting, and fermenting foods were some of the oldest food processing techniques used to preserve food by preventing yeasts, molds, and bacteria to cause spoiling.[5] Methods for preserving food have evolved to meet current standards of food safety but still use the same processes as the past. Biochemical engineers also work to improve the nutritional value of food products, such as in golden rice, which was developed to prevent vitamin A deficiency in certain areas where this was an issue. Efforts to advance preserving technologies can also ensure lasting retention of nutrients as foods are stored. Packaging plays a key role in preserving as well as ensuring the safety of the food by protecting the product from contamination, physical damage, and tampering.[5] Packaging can also make it easier to transport and serve food. A common job for biochemical engineers working in the food industry is to design ways to perform all these processes on a large scale in order to meet the demands of the population. Responsibilities for this career path include designing and performing experiments, optimizing processes, consulting with groups to develop new technologies, and preparing project plans for equipment and facilities.[5] See also Biology portal Technology portal Biofuel from algae Biological hydrogen production (algae) Bioprocess engineering Bioreactor landfill Electrochemical energy conversion Industrial biotechnology Moss bioreactor Photobioreactor References ^ a b "Biochemical Engineering". UC Davis. 2015-11-27. Retrieved 2019-02-13. ^ Ruairi.Kavanagh (2014-12-18). "Biochemical engineer". gradireland. Retrieved 2019-02-13. ^ "Chemical and Biochemical Engineering | School of Engineering". www.brown.edu. Archived from the original on 2019-02-12. Retrieved 2019-03-18. ^ "Biochemical Engineer | Science & Engineering Career". Science Buddies. Retrieved 2019-03-18. ^ a b c Driver, Kelly; Health, JH Bloomberg School of Public. "Food Processing". Johns Hopkins Bloomberg School of Public Health. Retrieved 2019-03-18. Retrieved from " Chemical engineering builds on the sciences, especially chemistry and now biology, to design good processes and products useful for society. Chemical engineers tend to be the broadest of all engineers and thus are employed in a wide range of industries. Besides being well-trained in sciences they appreciate the central role of economics as they are often concerned with the production of products that will be sold and bought at an affordable price. Their professional skills are required wherever engineering and chemistry or biology intersect. This occurs not only in the chemical industry but also in the biological, environmental, health, legal, and medical fields. Chemical engineers are researchers, designers, producers, and managers. Petroleum, paints, plastics, paper, detergents, pharmaceuticals, vaccines, microchips, drugs, processed foods, fertilizers, conventional and nuclear fuels, insecticides, rocket propellants, synthetic fibers, and rubber are among the many products they help create. Biotechnology Engineering (cert., Ph.D.) The ability to manipulate the genetic content of microbial, insect, animal, and plant cells has led to a variety of commercial applications in medicine, nutrition, materials science, and the environment. New biotechnology-derived pharmaceutical products are gaining FDA approval, and the sequencing of the human genome will lead to tremendous new opportunities in disease prevention. Study biotechnology at Tufts to develop the skills needed to develop today's products. Bioengineering - Cell and Bioprocess Engineering (M.S.) The Cell and Bioprocess Engineering track in the Bioengineering M.S. program looks at bioprocess design and optimization with emphasis on molecular and cellular processes. Our major educational objective for students is the attainment of core knowledge in both upstream and downstream engineering aspects of modern biotechnology. The core subject areas integrate applied biology, chemical reaction engineering and systems analysis. Topics include enzyme and pathway engineering; fermentation and bioreactors; and cellular systems modeling and analysis. Materials Science and Engineering (Joint Ph.D.) Materials scientists study how the history of a material influences its structure and properties, advancing understanding in research areas that include metallurgy, solid-state physics, and biomaterials. The interdisciplinary Materials Science and Engineering Ph.D. program offers graduate students a wide array of opportunities to study and develop materials that will change the world. chemical and biochemical engineering quarterly. chemical and biochemical engineering quarterly impact factor. chemical and biochemical engineering uwo. chemical and biochemical engineering dtu. chemical and biochemical engineering rutgers. chemical and biochemical engineering quarterly journal impact factor. chemical and biochemical engineering journal. chemical and biochemical engineering jobs

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