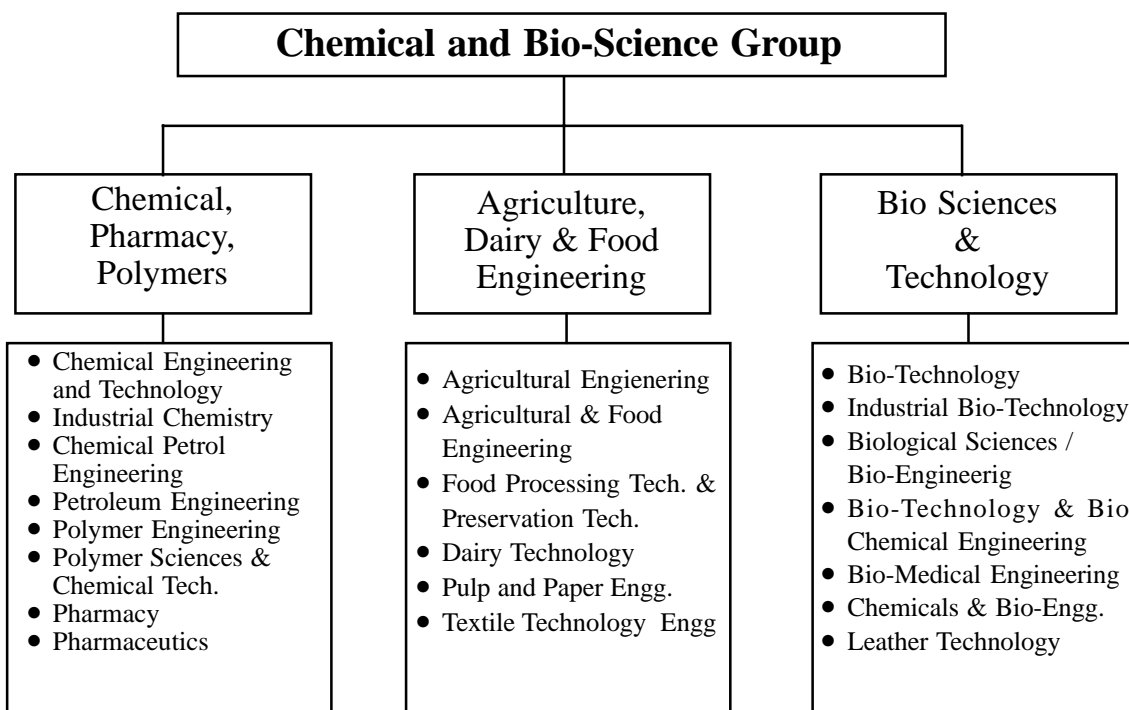

CHEMICAL & BIO-SCIENCE GROUP

This group covers courses dealing with Chemical, Petroleum, Pulp and Paper Polymers, Pharmacy and Pharmaceutics, Agricultural and Food Engineering, Bio-Technology and Bio-Chemical, Bio-Medical, Dairy Technology etc.



With huge manpower and fast developing economy, India is emerging as a leader and a key player in industries relating to this field of studies. The use of chemicals and chemical products along with several biological products has been propelling the world into a new era which draws on the convergence of Chemistry and Biology.

CHEMICAL ENGINEERING (CHE)



Chemical engineers are involved in design, installation, maintenance of chemical plants for large oil, chemical, pharmaceutical and allied industries.

The course covers Industrial chemistry, polymer technology, polymer processing, polymer stings, polymer synthesis etc. It includes all phases of technical activities having knowledge in Chemistry along with other basic sciences such as Mathematics, Physics, Biology, Computer Science to provide necessary requirements and offer product solutions to the society and its changing demands from time-to-time.

The engineers with this specialisation offer solutions to the society's problems relating to:

- Energy, health and environment.
- Food, clothing, shelter and materials.
- Supply of vast variety of products including chemicals, plastics, pharmaceuticals, food, textiles, fuels and industrial gases.
- Improvement of environment by reducing and eliminating pollution.
- Application of Bio-sciences in Bio-chemical, Bio-medical and Bio-technological fields.
- Design, supervision, installation, operations in which materials undergo physical and chemical changes in order to bring out useful products as per the needs and demand of people/industry.
- Fields in chemical technology and mineral based industries.
- Industries producing basic chemical materials for further extensive applications in pharmaceutical companies, process industries, manufacture of several utility products.

JOB OPPORTUNITIES

Chemical engineers are in good demand and have a very wide scope for employment in:

- Soap, Oil, Paint, Plastics, Synthetic fibers, food, textile, glass, rubber and explosive industries.
- Chemical Plants, Petroleum refineries.
- Defence establishments.
- Fertiliser plants, paper industries, atomic power plants.
- Space Research.
- R&D works in various research organisations, industrial undertakings both in public & private sectors.

CHEMICAL PETROL ENGINEERING (CPE)



CPE has been structured in such a manner that it meets the present as well as the future requirements of the industry. The job functions of graduates of this course will cover various fields of chemical technology in mineral based industries, petrochemical plants, synthetic fibers and even petroleum refinery plants.

The course provides necessary training in basic engineering disciplines with adequate emphasis on chemical engineering along with specialised courses in petrochemical technology related operations.

JOB OPPORTUNITIES

These engineers will be in a position to shoulder responsibilities in petrochemical plants as well as down stream industries. They may get employed as:

- Design engineers working for product along with mechanical and electrical engineers.
- Research engineers engaged in developing new petro-processes and products.
- Project engineers dealing with the design, installation and maintenance of petro plants and in manufacturing industries, supervising all operations related to the above.
- Engineers / Technologists in Petroleum refineries, fertiliser industries.
- Petrochemical, synthetic fiber, coal and mineral based industries.
- Organisations / Boards / Councils involved in the prevention and control of
- Environmental pollution.
- R&D Units as design, construction, operation & management personnel.
- Researchers, teaching personnel, Management professionals etc.
- Self-employed individuals in chemical, polymer related industries etc.

FOOD PROCESSING TECHNOLOGY (FPT)



FPT is a course suited best for students seeking career in Health, Agricultural and Environmental Science related industries as it focuses on automation, information, food safety, workers safety and environmental safety. With scope for projects in beverages, dairy, bakeries processing of fruits, vegetables & meat etc. the qualified persons have opportunities to work in the said area.

The course provides inputs in Food Chemistry, Food Engineering, Food Microbiology, Research techniques in examining the effects of variables in food quality & stability. It is an interactive course of many disciplines including; Biochemistry, Nutrition, Microbiology, Engineering, and Process Design to convert farm products into food.

However, consumers are now looking for foods that are free of chemical preservatives, yet having longer shelf life retaining their natural appearance and flavour.

Food Process technologists play a key role in:

- Effect continuous changes in food processing in tune with culture, tradition and new technological development.
- Application of Science & Technology for the development and expansion of Food industry.
- Development of new technologies relating to processing, storage of food products.
- Instrumentation involving food with technical insights in the subject of Food Sciences in the industries and processes like High Pressure pulsed electric fields, Microwave applications.
- Freezing & Packing methods, Predictive micro-biology, Non-thermal food preservation techniques.
- Focusing on next generation food processing techniques.
- Maintain quality in terms of appearance, organoleptic, characteristic, nutrition, value, safety.
- So, Food Process technologists look into all these aspects of food processing technology.

JOB OPPORTUNITIES

The Food Processing Technologists have job opportunities in

- Food processing industries.
- Microbiology and Food safety units.
- Food Testing Laboratories.
- Packaging & Labeling industries.
- Food processing incubators.
- Marketing as Professionals for Food/Farm alternatives.
- Industries that trigger interest in non-thermal processing.
- Major market for development of systems & machinery.
- Highly automated machinery manufacturing units.
- Technology Transfer Labs.
- Defence Food Research Labs.
- Central Food Technology Research Institute, Mysore.

India, the highest global producer of milk, and live stock and second largest producer of fruits and vegetables and third largest producer of food grains and seventh largest producer of fish is fast emerging as a major Food Processing sector. It is now in its nascent stage constituting 14% of the manufacturing GDP. This amounts to products worth Rs.3,00,000 Crores. From 1990 – 2000 it has grown at an average rate of 7.0% / per annum and has provided direct employment for around 130 lakh people and has the potential to promote 2.4 times indirect employment.



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CHEMICAL BIO ENGINEERING (CBE)



CBE is a product mix of chemical and bio-engineering providing the knowledge and technology of both chemical industry and bio-engineering. It is as the most important engineering discipline of the 21st century.

CBE aims at producing specialists in precision chemicals, bio-engineering, environment, energy and bio-materials (medical materials, electronic materials and biomes) by combining chemical processes and bio-engineering technologies. The students of CBE acquire knowledge and computer skills that are used in design & development in plant design and bio-information.

JOB OPPORTUNITIES

Being a blend of chemical and biological engineering, the graduates of this course find jobs in:

- Chemical or Bio-engineering or both industries.
- Industries involved in food production, processing & environment.
- Pharmaceuticals and medicine manufacturing units.
- Industries dealing with Agro products, live stocks, marine products.
- Environmental protection.
- As researchers, faculty in engineering & training & Research institutions.



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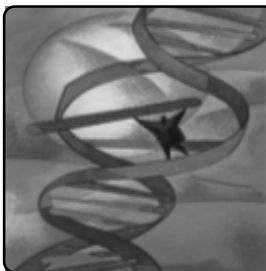
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BIO-TECHNOLOGY (BIO)



A relatively new course being offered in some of the engineering colleges, BIO deals with many aspects relating to several bio-products in agriculture, agro-chemicals, fertilisers, plastics, machinery etc. It is a new area emerging out of the convergence of Chemistry and biology. Biologically, catalysed processes for production of fine Organic chemicals and pharmaceuticals will be delivered through Bio-Technology.

The Bio-technologists make adequate study of bio-catalysis, bio-engineering systems, bio-molecular materials and bio-materials. The Bio-technology and expanding field is awide with application in areas of medicine, food technology, pharmaceuticals, agriculture and environmental conservation.

Bio-technologists are involved in varied modes of energy production, conservation, chemical processes, textile development, cosmetics, genetic engineering, industrial waste treatment etc.

Based on several studies, findings and the future forecasts BIO is predicted to have quite a high potential even surpassing the software field, in the years to come.

JOB OPPORTUNITIES

The Bio-technologists find placements in:

- Organisations, institutions, industries dealing with engineering bacteria
- Genetic Engineering and other industries using bio-technological techniques for higher efficiency and cleaner process industries.
- Bio-engineering industries, which produce valuable products from the disposed waste including hazardous waste.
- Industries producing bio-fuel, bio-medical instruments.
- Maintenance and service providers in hospitals and health care units etc.

BIO-MEDICAL ENGINEERING (BME)



BME is medical engineering course is gaining popularity as a specialised course to augment the requirement of health care industry. With advancements taking place in the medical field through the introduction of several innovative medical instruments to detect, diagnose and develop tools and equipment with a perfect understanding of the biological and physiological systems of human body.

The course intends to provide competence and adequate training to the students in the related fields. It is offered in some engineering colleges which have facility of collaboration with leading hospitals.

JOB OPPORTUNITIES

The Bio-medical engineering graduates find placements in

- Organisations, institutions, industries dealing with engineering bacteria.
- Genetic Engineering and other industries using bio-technological techniques for higher efficiency and cleaner process industries.
- Bio-engineering industries, which produce valuable products/byproducts from disposed waste including hazardous waste.
- Industries producing bio-medical instruments.
- Maintenance and service providers in hospitals and health care units etc.

PHARMACY (PHM)



An applied science dealing with the chemistry action of drugs and its preparation in medicines, PHM includes the study of diseases and the required choice of treatment. The course includes pharmacology, which is a pure and experimental science involving the studies of the action of drugs on living beings. Pharmacy is primarily concerned with the allopathic stream of medicine.

PHM, as an academic course, has come into demand with other disciplines since a couple of decades. With rapid advancement in treatment of scores of diseases that afflict the human body, it has increasingly taken a very sophisticated approach and break through in research in the field of treatment.

The salient features of this course are

- It is possible for a pharmacist to shift career from pharmacy to pharmacology.
- As a pharmacist, one can be engaged in formulating and testing different drugs, which is a study of their effectiveness as well as side effects.
- Continuous updating of knowledge about the prevailing diseases and their treatment.
- Meeting the requirement of Pharmacy industry (where the seller does not meet the end consumer).

JOB OPPORTUNITIES

With the advent of MNCs in the field, the prospects for PHM have been increasing day by day. “The post-patent era” is the real boom for the pharmaceutical industry, in a way identical to the boom in IT industry we have seen. Launching of new molecules would lead to higher demand for skilled marketers. Globalisation has paved way for smooth Technology transfers new opportunities in R&D and New Drug Delivery system, adding a new dimension to the industry.

A pharmacy graduate can pursue a career in different functional areas as:

- Industrial pharmacists, Research Pharmacists, Retail Pharmacists.
- Medical Representatives and Pharmacists in hospital or in the Government sector as
- Faculty in Colleges and Universities.
- Production Managers supervisors in Pharmaceutical industries in various departments related to tablets, capsules, syrup, indictable etc.
- Q & A chemists in a pharmaceutical company.
- Research & Development personnel within pharmacy industry.
- Sales & Marketing professionals.
- Brand Managers involved in brand product management.
- Entrepreneurs setting up drug farm for producing raw materials and growing herbs and plants. Drug-dispensing store (a chemist store), which requires professional ability as well as management and marketing skills.
- Chemists and druggists working in distribution firms, analytical laboratories.
- Personnel employed in Government regulatory agencies like FDA as a drug inspector having career growth to rise to the position of Drug Controller.
- As pharmacists in hospitals, clinics and nursing homes involved in the preparation, storage and supply of medicines.
- As consultants or patent lawyers for pharmaceutical products.
- Persons working in administrative departments of hospitals and health care units. The job involves liaison with drug manufacturers, testing and review of drugs, managing their storage and supply chain.
- Pharmacy graduates can work in NGOs that are involved in welfare of the community in helping them manage their medicine, purchase and supply of medicine and advice them about their use to people.

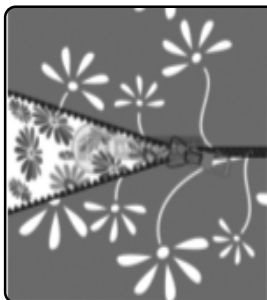


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TEXTILE TECHNOLOGY (TEX)



TEX has, now a days, become a highly sophisticated and scientific, engineering activity due to the inventions and innovations of new types of fibers and technologies. The Textile industry in some form or the other is present in the woven, knitted or printed form of fabrics, furnishings, upholstery, carpets, lace etc. Right from manufacture of tooth brush, cars' tyres and upholstery, polyester fabrics are used in apotheosis in the heart to replace worn out blood vessels, (the uses of carbon fiber in rockets, the products of textile are used).

The Course includes subjects dealing with technologies relating to fabrics – natural and synthetic, yarn preparation and production, spinning, weaving, knitting, dyeing and finishing. It also deals with new technologies and processing methods for clothing, furnishings, carpeting, technical textiles etc. The field encompasses different branches of engineering such as Mechanical, Electrical, Computer, Chemical, Instrumentation, Electronic and Structural Engineering. Textile industry in India is one of the oldest industries and is providing direct employment to about 30 million people. The indirect employment through sales, marketing, processing etc., will be around 6 to 8 times the number if not more.

With yarn exports increasing every year and the growth in textile industry and ever increasing population coupled with desire for latest trends in fashion the various streams viz., weaving, knitting, testing, printing and dyeing, technical textiles offer excellent opportunities to textile engineers / technologists.

JOB OPPORTUNITIES

The textile engineers / technologists find jobs in

- Cotton Corporations.
- Test houses for cotton & synthetic fiber.
- Industries involved in sophisticated knitting machines.
- Major textile machinery manufactures.
- Textile composite mills.
- Industries involved in spinning, weaving and garment making.
- Software industries concerned with apparel & fashion technology, technical textiles etc.
- Opportunities exist for self-employment and further studies.