

Engineering profession

Engineering is an activity other than purely manual and physical work. It brings about the utilization of the materials and laws of nature for the good of humanity

Engineering is the art or science of utilizing, directing or instructing others in the utilization of the principles, forces, properties and substances of nature in the production, manufacture, construction, operation and use of the things ... or means, methods, machines, devices and structures.

Agricultural engineering

Agricultural engineering includes appropriate areas of mechanical, electrical, environmental, and civil engineering, construction technology, hydraulics, and soil mechanics.

The use of mechanized power and machinery on the farm has increased greatly throughout the world, fourfold in the United States since 1930. Research in energy use, fluid power, machinery development, laser and microprocessor control for maintaining grain quality, and farm structures is expected to result in further gains in the efficiency with which food and fibre are produced and processed.

Agricultural production presents many engineering problems and opportunities. Agricultural operations—soil conservation and preparation; crop cultivation and harvesting; animal production; and commodities transportation, processing, packaging, and storage—are precision operations involving large tonnages, heavy power, and critical factors of time and place. Facilities designed to aid farm operations help

farm workers to minimize the time and energy requirements of routine jobs.

Four primary branches have developed within agricultural engineering, based on the problems encountered. Farm power and machinery engineering is concerned with advances in farm mechanization—tractors, field machinery, and other mechanical equipment. Farm structures engineering studies the problems of providing shelter for animals and human beings, crop storage, and other special-purpose facilities. Soil and water control engineering deals with soil drainage, irrigation, conservation, hydrology, and flood control. Electric power and processing engineering is concerned with the distribution of electric power on the farm and its application to a variety of uses, such as lighting to control plant growth and certain animal produce operations.

Agricultural Engineering Sub Disciplines

There are variety of options in the Agricultural field and for the effective management. Agricultural Engineering degree programme is divided into sub disciplines such as

1. Farm Machinery and Power Engineering
2. Soil and Water Conservation Engineering
3. Irrigation and Drainage Engineering
4. Post Harvest Systems Engineering
5. Farm Structures and Environmental Engineering

Objectives of Agricultural Engineering

1. Reduction in farm hazards : The causes of these hazards are identified and solutions are given. This ensures that the farmer's labor is not in vain.
2. Reduction of drudgery in agricultural operations: Agricultural engineering intervention is to develop machines and equipment that can be used in performing agricultural operations to reduce stress on farmers.
3. Ensuring the availability of agricultural products all year-round, processing helps increasing their lifespan.
4. To meet all year round demand of seasonal crops, they have to be processed and stored. Structures for long – term storage have to be built.
5. Operations and management of food processing machines such as rice mills, flour mills, vegetable oil processing outfits, beverages and biscuit manufacturing, bread, and other confectioneries.
6. Low cost of production with increased productivity and reducing labor, energy cost, and proper planning.
7. Agricultural engineering provides conveniences on the farm, such conveniences include farmhouses, good farm roads, farm structures & dairy barns etc.

Challenges in front of Agricultural Engineer :

While it might seem like a glamorous and exciting profession but, it's no wonder the challenges are endless: crops need to grow in diverse environments, and there are endless combinations of weather conditions, seeds, and fertilizers.

Some of these challenges are :

1. In irrigated areas, the challenges lie in improved farm irrigation efficiency by reducing irrigation water losses. The water table is going alarmingly down due to indiscriminate use of irrigation water by tube-well and minor irrigation which is also damaging soil conditions. Suitable water management practices are required in the areas.
2. There is also a need to develop improved tools and implements for horticulture crops and agricultural products.
3. The greatest challenge for the technologists, engineers, and scientists for the 20 years lies in the area-based surveys, the technology of crops related to fruits, vegetables, and their by-products. Proper methods of food preservation, processing packaging, marketing need to be developed for enhanced shelf-life and better return.
4. There is also a need to develop specific crops and appropriate post-harvest technology .