

TECHNOLOGY/ENGINEERING/MATHEMATICS

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Architecture

Architecture is the use of creativity and a practical understanding of structures and materials to develop concepts, plans, specifications and detailed drawings for buildings and other structures. Architects negotiate with builders and planning authorities, administer building contracts and inspect the work carried out. This field is a combination of engineering and design. Architects are responsible for providing the detailed instructions and drawings to create buildings.

Motivation: Arts, Experimenting, Organization

Aptitudes: Visual, Numeric, Spatial, 3-D

Personality: Imaginative, Spontaneous, Assertive, Solitary

Secondary school subjects required:

Mathematics

Geography

Physics

Art and Design

Where do they work?

Construction companies, individually and designing firms.

Tasks

Taking into account all aspects of the design, structure and purpose of a building project discuss requirements of clients or builders (to design a new structure or modify an existing one) and prepare a brief

Prepare sketch drawings, production drawings and detailed drawings by hand or using computer-aided design (CAD) equipment

Combine structural, mechanical and artistic elements into the building design

Discuss designs and cost estimates with clients and others involved in the project, including engineers, quantity surveyors, landscape architects and town planners

Obtain necessary approvals from authorities

Prepare specifications and contract documents specifying building materials, construction equipment and, in some cases, the interior furnishings, for builders, trades people and legal advisers

Observe, inspect and monitor building work, to make sure that it is progressing according to the contract and specifications

Evaluate projects once they are completed and occupied.

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Computing & IT

Computing includes designing and building hardware and software systems for a wide range of purposes - processing, structuring, and managing various kinds of information; doing scientific studies using computers; making computer systems behave intelligently; creating and using communications and entertainment media; finding and gathering information relevant to any particular purpose, and so on. The list is virtually endless, and the possibilities are vast.

Motivation: Experimenting, Organisation, Art

Aptitude: Visual, Numeric, Sequences and Spatial

Personality: Deliberate, Passive, Imaginative, Solitary

Secondary school subjects required:

Mathematics

ICT/ Computer Science

English

Where do they work?

Research and Development, Government, Organisations, Institutions, Companies, individually.

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The various segments are:

Computer Engineering: Typically involves software and hardware and the development of systems that involve software, hardware, and communications.

Computer Science: Currently the most popular of the computing disciplines; tends to be relatively broad and with an emphasis on the underlying science aspects.

Information Systems: This is computing in an organizational context, typically in businesses.

Information Technology: Focuses on computing infrastructure and needs of individual users; tends to involve a study of systems.

Software Engineering: Focuses on large-scale software systems; employs certain ideas from the world of engineering in building reliable software systems.

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Engineering

Engineering is the discipline, art, and profession of acquiring and applying scientific, mathematical, economic, social, and practical knowledge to design and build structures, machines, devices, systems, materials and processes that safely realize solutions to the needs of society.

Motivation: Physical, Experimenting, Art

Aptitude: Numeric, Visual, Figurework, 3-D, Sequential

Personality: Factual, Deliberate, Passive, Solitary

Secondary school subjects required:

Mathematics

Physics

Chemistry

Biology

ICT/ Computer Science

English

Where do they work?

Businesses, Multi-national corporations, Research and Development, Laboratories, Industrial Plants and Factories, Production Houses.

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The few segments are:

Electronics engineering: it is the discipline which designs, develops, tests and maintains electronic parts and systems used in computers, communications, navigation, industry and entertainment.

Electrical engineering: A stream which deals with the designing, developing and supervision of the manufacture, installation, operation and maintenance of electrical systems. They work on systems for the generation, distribution, utilisation and control of electric power. They also work on electronic systems used for computing, communications and other industrial applications.

Mechanical engineering: This is used to plan, design and oversee the development, installation, operation and maintenance of machinery. They conduct research to solve practical engineering problems and improve efficiency.

Aerospace engineering: This is used to perform and supervise the design, development, manufacture and maintenance work on all types of flight vehicles. This may include military and civilian aeroplanes, helicopters, missiles, launch vehicles, spacecraft, satellites and control and guidance systems.

Civil engineering: This is to plan, design, construct, operate and maintain roads, bridges, dams, water supply schemes, sewerage systems, transportation, harbours, canals, dockyards, airports, railways, factories and large buildings.

Biotechnology/Biomedical Engineering: Biomedical engineering is the application of engineering principles and techniques to the medical field.

Environmental Engineering: Environmental engineers are concerned with assessing and managing the effects of human and other activity on the natural and built environment. They apply their engineering knowledge and skills to such things as environmental impact assessment, natural resources management and pollution control.

Marine engineering: This is the application of engineering to control the installation, operation and maintenance of machinery and equipment on ships and offshore structures.

Computer engineering: This is the involvement in the installation, repair and servicing of computers and associated equipment (peripherals). They may sometimes be described as information technology (IT) hardware technicians, service engineers or computer systems engineers.

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Math & Statistics

Mathematics is the study of quantity, structure, space, and change. Mathematicians seek out patterns, formulate new conjectures, and establish truth by rigorous deduction from appropriately chosen axioms and definitions.

Statistics is the science of making effective use of numerical data relating to groups of individuals or experiments.

Motivation: Experimenting, Organization, Business

Aptitude: Numeric, Figurework, 3-D and Visual

Personality: Factual, Deliberate, Passive, Solitary

Secondary School subjects required:

Mathematics

Statistics

English

Where do they work?

Communications, Aerospace, Research and Development Institute, Educational Institutes, government, electronic and engineering firms.

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About math and statistics:

Mathematics: Mathematicians apply mathematical principles to solve problems in all areas of the sciences, technology, social sciences, business, industry and commerce.

Statistics: Statisticians design and apply statistical techniques for collecting and analyzing data to produce useful information from areas such as science, technology, medicine, business, finance and government.

A biostatistician studies links between human diseases and their causes. They usually work in hospitals, pharmaceutical companies or government health departments, and use computers to investigate risk factors for health problems.

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Physics

Physicists study the behavior of the physical world at the most basic level, and then find practical ways to apply new knowledge gained from their research in many areas of science and technology.

Motivation: Experimenting, Physical, Organization

Aptitude: Numerical, Figurework, Visual, 3-D, Spatial

Personality: Factual, Deliberate, Passive, Solitary

Secondary School Subjects required:

Physics

Mathematics

Chemistry

ICT/ Computer Studies

Where do they work?

Government, military, hospitals, university, schools, research institutes, laboratories.

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The various segments in physics:

Theoretical Physicists: Those who develop theories or models of how particular aspects of the world work

Experimental Physicists: Those who test these theories, determining their limits and suggesting new approaches to them

Applied Physicists: Those who apply these findings in practical settings, such as within industry and through the introduction of new technology.

There is interaction between all three roles and physicists generally have skills in each of these areas.

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Textile Technology

The textile industry is concerned with the production and manufacture fabrics. A lot of processes and various degrees of work are required in manufacturing and finally selling the product.

Motivation: Arts, Experimenting, Business

Aptitude: Numerical, Spatial, Figurework, Visual, Sequences

Personality: Imaginative, Deliberate, Passive, Solitary

Secondary school subjects required:

Art

Mathematics

Physics

Chemistry

Where do they work?

Factories, Garment production houses, Cottage industries, Clothing design houses.



The various segments are:

The textile industry is vast in its application and there is a variety of technical detail and creative ideas involved after the actual production of fabric or rather the separation of it. There is the procurement of the raw material and the processing there after to furnish it into the final product.

Textiles include woven, knitted or printed fabrics used for making clothes, furnishings, upholstery, carpets, lace etc.

Textile technology, once considered a handicraft, has become a highly sophisticated, scientific and engineering activity thanks to the invention of new types of fibres and technologies. The field encompasses different areas of engineering such as mechanical, electrical, computer, chemical, instrumentation, electronic and structural engineering. Apparel and fashion technology, a part of textile technology has become an important activity for the designing, fashioning and marketing of garments. All this requires knowledge of latest technology and the present day textile-design students are poised to take up the challenge.

Textile Engineering

Textile Information Systems Design

Polymer Engineering

Biomaterials Engineering

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