A. QUALIFICATIONS

I. DIPLOMA: Provides Training and Occupational Skills course work for grater employment and advancement possibilities. Normally 80% course is dedicated towards attainment of practical skills. Apprenticeship is an integral part of these courses. Most of the programs are of 8-12 months and are targeted for individuals between 16-19 years of age. Ex: Automotive Technician, Diesel and Heavy Mechanic Technician, Welding, Pharmacy Technician etc…

II. ADVANCED DIPLOMA: Are an Extension of Diploma and includes more theory and specialization on the subject of study. Most of the countries treat it as a part of undergraduate degree and have progression pathways. Mostly taken up by professionals as an extension of existing qualifications. Ex: Accounting & Finance, Animation, Aviation, Financial Planning etc.

III. ASSOCIATE DEGREE: Awarded after 2 years of Study at a Community College, Technical College or a Bachelor Granting University in USA and Canada. These act as foundation program based on which students pursue their specialization for next 2 years towards Bachelor Degree. Some of the programs offered under associate degree are: Business and Commerce Technology, Mechanical Technology, Data Processing etc.

IV. BACHELORS DEGREE: Is usually awarded for undergraduate studies ranging from 3- 4 years, wherein student goes through extensive classroom and practical training towards his program of specialization. Some of degrees awarded are Bachelor of Science/Engineering/Arts/ Philosophy/Business etc. These is basic qualification required by most of the employers all over the world.

V. POST GRADUATE CERTIFICATE: Is normally awarded for a postgraduate qualification which is less than postgraduate diploma or Masters Degree. Normal duration of it is 6 months. Mostly provided by universities in UK and Australia. In Canada the duration of this course is for 1 year and is an extension to the Bachelor Degree earned by the candidate. As with other diplomas focus more of enhancement of employability skills of students. Ex: PG Cert in Business/Computer Science/ Electrical Engineering etc.

VI. POST GRADUATE DIPLOMA: Awarded for completion of qualifications after Bachelors. Normal duration for the course is 1 year. Like Post graduate Certificate it's a pathway towards Master's Degree. Ex: PG Diploma in Computer Science/ Biology etc.

VII. MASTERS: Awarded for Study of 2 years after Bachelor's Degree. It may be Classroom Base, Research based or normally combination of both. It is generally an extension specialization based on Bachelor's degree. Some countries such as United Kingdom offers Masters ranging for 12-16 Months duration. Normally it is an essential prelude for eligibility of admission into doctorate program. Some of the Examples of Master's Degree are Masters in Science/Art/Law/ Business/Engineering/ Theology etc…

VIII. INTEGRATED PHD: These programs are designed as a combination of Masters along with doctorate degree. The basic qualification required for admission is a Bachelor's

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Degree in the related discipline. These are offered to exceptional candidates who have huge potential and ability to excel in high performance environment. The purpose of the integrated Phd is to gradually condition one's thoughts towards research, while providing a view of the trials and tribulations in small doses. So when one joins an Int. PhD program, just in 2-3 months, one is shuttled from a semester-and-exam based system to one where you are learning skills and tools all the time, with evaluations based on presentation, data talks and discussions. These programs are offered across all disciplines i.e. Computer Science/All Engineering/Life Sciences etc… and are of 4-5 years duration.

PHD : Doctorate degrees are offered after completion of Masters Degree. You'll learn more in the first year of Int. PhD than you ever will in the first year of any other degree. The fact that mostly premier institutes offer this program ensures that the student would be exposed to cutting-edge technology, world-renowned speakers and an internationally trained faculty. Since the requirements are tough and the course is purely research Based, admissions criteria are usually very stringent. The normal duration of the Phd Program is 5 years. These programs are offered across all disciplines i.e. Computer Science/All Engineering/Life Sciences etc…. Most of the times students are eligible for fellowships while pursuing their Phd's.

IX. NOTE : We have tried to cover basic points of the most common qualifications. There are bound to be exceptions as it varies across different countries. Please email us at info@hyderabadoverseas.com or call us at 91-9000013364 for any further queries.

B.SPECIALIZATIONS

COMPUTER SCIENCE ENGINEERING

I. COMPUTER SCIENCE: Computer science is a discipline that involves the understanding and design of computers and computational processes. In its most general form it is concerned with the understanding of information transfer and transformation. Particular interest is placed on making processes efficient and endowing them with some form of intelligence. The discipline ranges from theoretical studies of algorithms, functionalities, to practical problems of implementation in terms of computational hardware and software. There are many different specializations under its broad Spectrum.

Few of the most popular ones are being listed below:

1. SOFTWARE ENGINEERING: A still-evolving discipline based on computer science, computer technology, management, and engineering economics. Concerned with the cost- effective development and modification of computer software components, software engineering may use computer-aided software engineering (CASE) to reduce the time required by programmers to generate new programs and revise old ones. Courses in software engineering may be available through undergraduate computer science departments; advanced study is available at the graduate level.

2. MANAGEMENT INFORMATION SYSTEMS: MIS programs emphasize the understanding and application of computer technology to organizational problems, the design of computer-based systems for data processing, and the design of decision-support systems for management. University business departments may offer undergraduate courses and programs in MIS; many graduate business schools provide advanced study in MIS. Since there has been paradigm shift in demand for professionals in Data Analytics, Data Warehousing, more and more students are getting inclined towards MIS.

3. DATABASE MANAGEMENT: Involves the study of systems, known as databases that can efficiently store, process, and retrieve substantial quantities of information. Undergraduate computer science programs may offer introductory database courses although advanced study, including analysis and design of relational, network, and hierarchical databases, generally occurs at the graduate level.

4. ARTIFICIAL INTELLIGENCE: AI is a complex, highly interdisciplinary branch of computer science that attempts to incorporate the principles of human intelligence and reasoning into computing systems. AI research is concerned with modeling all facets of human intelligence, but most often the research involves creating computer systems that have the ability to plan (automated deduction), adapt to different situations (machine learning), acquire human-like senses (machine vision and natural-language processing), and effect changes to the environment (robotics). Introductory courses in AI are offered at the undergraduate level; in- depth study is available at the graduate level.

5. COMPUTER NETWORKS: The study of the principles of communication between computers. Computer networking emphasizes the design of local area networks (LANs), which connect computers within a small geographical area, and wide area networks (WANs), which use telephone lines or radio waves to connect computers thousands of miles apart. B.S. degree programs generally offer introductory networking courses; graduate programs offer advanced courses in network architecture, communication protocols, and network topology. With the advent of new technologies in transmission of data making it cheaper and faster, it has limitless possibilities.

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6. BIO INFORMATICS: Bioinformatics is the application of computer technology to the management of biological information. Computers are used to gather, store, analyze and integrate biological and genetic information which can then be applied to gene-based drug discovery and development. The need for Bioinformatics capabilities has been precipitated by the explosion of publicly available genomic information resulting from the Human Genome Project. Bioinformatics is at Infant stage but keeping in view the advancements and breakthroughs in Biotechnology and Genetic Engineering, it has become area of focus most of the top IT companies and universities.

7. HUMAN COMPUTER INTERFACE: Human-computer interaction (HCI) is an area of research and practice that emerged in the early 1980s, initially as a specialty area in computer science embracing cognitive science and human factors engineering. HCI has expanded rapidly and steadily for three decades, attracting professionals from many other disciplines and incorporating diverse concepts and approaches. To a considerable extent, HCI now aggregates a collection of semi-autonomous fields of research and practice in human-centered informatics. However, the continuing synthesis of disparate conceptions and approaches to science and practice in HCI has produced a dramatic example of how different epistemologies and paradigms can be reconciled and integrated in a vibrant and productive intellectual project

8. DATA WAREHOUSING & DATA MINING: Data warehouse is a subject-oriented, integrated, time-variant and non-volatile collection of data in support of management's decision making process. A data warehouse is a copy of transaction data specifically structured for query and analysis. Subject-Oriented: A data warehouse can be used to analyze a particular subject area. For example, "sales" can be a particular subject. Integrated: A data warehouse integrates data from multiple data sources. For example, source A and source B may have different ways of identifying a product, but in a data warehouse, there will be only a single way of identifying a product. Time-Variant: Historical data is kept in a data warehouse. For example, one can retrieve data from 3 months, 6 months, 12 months, or even older data from a data warehouse. This contrasts with a transactions system, where often only the most recent data is kept. For example, a transaction system may hold the most recent address of a customer, where a data warehouse can hold all addresses associated with a customer. Non-volatile: Once data is in the data warehouse, it will not change. So, historical data in a data warehouse should never be altered. Computational progress in last 30 years has resulted in storage of trillions of Megabyte of data in various formats. All major companies are looking to normalize the data and to get the reports based on parameters as per their requirements using Data Mining Techniques.

9. WEB TECHNOLOGIES & WEB DESIGNS: Web technology relates to the interface between web servers and their clients. It includes markup languages, programming interfaces and languages, and standards for document identification and display. Ex. HTML, XML, CGI PERL etc.

10. NETWORK SECURITY: Network security involves all activities that organizations, enterprises, and institutions undertake to protect the value and ongoing usability of assets and the integrity and continuity of operations. An effective network security strategy requires identifying threats and then choosing the most effective set of tools to combat them. Ex: Antivirus, VPN's, Encryption

11. E-COMMERCE: Electronic commerce or ecommerce is a term for any type of business, or commercial transaction, that involves the transfer of information across the Internet. It covers a range of different types of businesses, from consumer based retail sites, through auction or music sites, to business exchanges trading goods and services between corporations. It is currently one of the most important aspects of the Internet to emerge.

12. COMPUTER GAMES TECHNOLOGY: Games technology is at the forefront of computer science development. Students will gain knowledge of human / computer interaction, software development and implementation and hardware design concepts. Students may choose the industry placement program and gain exposure to industry leaders in games technology.

13. IT PROJECT MANAGEMENT: IT project management is an area of project management that has an emphasis on computer technology. This form of project management differs from other management systems in the way that it deals specifically with how information is handled via both software and hardware.

14. INFORMATION SCIENCE: This rapidly expanding interdisciplinary field examines the nature of information itself as well as the processes by which information transfer occurs. Drawing on other fields such as telecommunications, computer science, linguistics, philosophy, mathematics, psychology, and sociology, information science involves the analysis and development of systems for the storage and dissemination of information using computers, telecommunications, or other technologies. Courses may be offered at the B.S. degree level; graduate computer science programs provide opportunities for advanced study.

15. MS PREDICTIVE MANAGEMENT: focused on data that are analysed over the long term with the goal of planning management tasks on time in order to minimise proactive management and thus optimise the availability of the business services. In predictive management, the emphasis is on collecting a lot of data, categorising this data and drawing conclusions from this data regarding the future behaviour of the infrastructure. This helps prevent incidents and problems in the areas of availability, capacity, performance and user experience. In contrast to proactive management, the management is able to see at a much earlier stage that the guaranteed availability of the business service is in danger.

16. DATA PROCESSING: A broad, often confusing term used to describe a wide range of fields involving the study of how data is stored in computers (for example, stacks, queues, and files) and how data can be processed to solve accounting and management problems. In most cases, data processing courses and programs are offered through business rather than computer science departments. Programs offered by technical colleges (often called data processing technology programs) provide vocational training in data entry and computer operations. Four-year colleges and universities may offer data processing programs that combine study of management and computer science. Such programs are often intended to train managers, known as electronic data processing (EDP) managers, to run complex computer centers. At the graduate level, data processing-related subjects may be included as part of management information systems or information science degree programs.

17. KNOWLEDGE ENGINEERING: Knowledge engineering is a subfield of artificial intelligence that produces a type of computer system called an expert system. Expert systems are computer programs designed to perform at the level of the hum an expert. solving problems that are beyond the capability of conventional computer systems. Introductory courses are sometimes offered at the undergraduate level; in-depth study is available at the graduate level.

18. COMPUTER ENGINEERING: A broad discipline that incorporates the fields of computer science and electrical engineering. Computer engineering emphasizes the theory, design, and development of computers and computer-related technology

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including both hardware and software. B.S. degree programs in computer engineering are most often available through engineering schools but also may be offered by computer science departments. Graduate programs provide opportunities for advanced study in computer engineering.

19. COGNITIVE SCIENCE: A branch of computer science that is concerned with understanding, simulating, and enhancing both natural and artificial intelligence. Highly interdisciplinary in nature, cognitive science draws from research in artificial intelligence, psychology, anthropology, linguistics, philosophy, neuroscience, and engineering. A few U.S. institutions offer interdisciplinary bachelor's degree programs in cognitive science; more often, however, this specialization is available at the graduate level.

20. COMPUTER GRAPHICS & ANIMATION TECHNOLOGY: This specialization, which is related to graphic design and the visual arts, combines video and computer technologies to produce two-, three-, and four-dimensional graphic images (such as those seen in video games and computer- animated films) using computers. The content and emphasis of computer graphics programs vary greatly depending on the level of study and the department through which the program is offered. Programs are offered at the undergraduate and graduate levels, with the graduate programs focusing on more theoretical, complex areas.

21. ROBOTICS: A branch of computer science that applies artificial intelligence and engineering concepts to create and program mechanical devices (robots) that are able to perform a variety of tasks including some previously performed by humans. Many technical and community colleges offer associate degree programs in robotics technology, which involves troubleshooting and maintaining robots; courses emphasizing the theory and design of robots may be offered through B.S. programs; advanced robotics study is available through graduate programs.

22. COMPUTER INFORMATION SYSTEMS: This specialization, which is closely related to management information systems and information science, integrates the computer applications of data processing with problem solving to improve the efficiency of organizations. Course work in CIS may be available through undergraduate computer science or business degree programs; specialization may be available through graduate programs.

23. COMPUTER SERVICING TECHNOLOGY: The study of how to install, repair, and maintain computers and related equipment. Associate degree or certificate programs are offered by many technical and community colleges.

II. ELECTRICAL & ELECTRONICS ENGINEERING: Electrical engineering is concerned with the basic forms of energy that run our world. Whether it's gas, hydro, turbine, fuel cell, solar, geothermal, or wind energy, electrical engineers deal with distributing these energies from their sources to our homes, factories, offices, hospitals, and schools. Electrical engineering also involves the exciting field of electronics and information technology. Wireless communication and the Internet are just a few areas electrical engineering has helped flourish, by developing better phones, more powerful computers, and high-speed modems. As we enter the 21st century, the technology that surrounds us will continue to expand and electrical engineers are leading the way. Electronics is the technology associated with electronic circuits and systems, and is one of the major branches of electrical engineering. It is a discipline that uses scientific knowledge of the behaviour and effects of electrons to create components, devices, systems or equipment that use electricity as part of their source of power. These components include capacitors, diodes, resistors and transistors.

Some of the specializations of Electrical and Electronic Engineering are:

1. VLSI & EMBEDDED SYSTEMS: The VLSI and Embedded Systems covers the fundamentals and engineering aspect of designing and developing IC based systems. Traditionally VLSI technology has emerged out as a successful conglomeration of two streams: material science and electrical engineering. The state of the art VLSI technology requires research in physical devices as well as novel design and development of electrical circuit. It focuses on developing hands-on skill of designing semiconductor devices and circuits, architecting systems using embedded components such as, CPU, memory and peripherals.

2. POWER SYSTEMS: The electric power industry is in the midst of exciting change. What was once a largely passive system is being redesigned to incorporate sensors, smart devices, advanced computer controls at many levels, and efficient handling of large amounts of electrical energy. Courses focus on modeling of different components of the system, design and operation of large interconnected power systems, fault analysis and protection, power electronics technologies for control of power devices, and renewable energy technologies. Students are exposed to smart grid concepts and various computer tools needed for analysis and design of efficient power systems. Students engaged in this option expect to work on challenging problems related to the delivery of large amounts of electrical energy in a safe, reliable, economical, clean, and sustainable manner.

3. DIGITAL SIGNAL PROCESSING: The world of science and engineering is filled with signals: images from remote space probes, voltages generated by the heart and brain, radar and sonar echoes, seismic vibrations, and countless other applications. Digital Signal Processing is the science of using computers to understand these types of data. This includes a wide variety of goals: filtering, speech recognition, image enhancement, data compression, neural networks, and much more. DSP is one of the most powerful technologies that will shape science and engineering in the twenty-first century.

4. TELECOMMUNICATIONS: Telecommunications is a universal term that is used for a vast range of information-transmitting technologies such as mobile phones, land lines, VoIP and broadcast networks. In telecommunications, data is transmitted in the form of electrical signals known as carrier waves, which are modulated into analog or digital signals for transmitting information. Analog modulation such as that used in radio broadcasting is an amplitude modulation. Digital modulation is just an updated form of this.

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5. MICROELECTRONICS: This option focuses on digital hardware design with emphases on microprocessors and field programmable gate arrays. It is similar to the Embedded Systems option within the Computer Engineering program, but it focuses less on software and more on high-performance circuit design techniques.

6. REMOTE SENSING AND SPACE SYSTEMS: deals with Active (radar and lidar) and passive (radiometry) remote sensing of the atmosphere; radar, radiometer, and lidar systems; rocket and satellite instrumentation; atmospheric electrodynamics; meteoric effects in the ionosphere; modeling of atmospheric processes; plasma physics.

7. OPTICS: A technology that uses glass (or plastic) threads (fibers) to transmit data. A fiber optic cable consists of a bundle of glass threads, each of which is capable of transmitting messages modulated onto light waves.

8. ELECTROMAGNETICS, NANOTECHNOLOGY & PHOTONICS: Whether naturally generated (i.e. solar radiation, lightning), or manmade (i.e. radio stations, cell phones, power lines), EM is all around us. Our offices, kitchens, and cars are all equipped with devices that rely on electromagnetic fields. EM comes into play every single time we turn a power switch on. The wireless communications revolution has EM at its very core. Voice and data information is transmitted and received via antennas. High frequency electronics, fiber optics, nanotechnology and almost every medical component on the market today require knowledge of electromagnetics.

9. WIRELESS COMMUNICATIONS: Wireless communication involves the transmission of information over a distance without help of wires, cables or any other forms of electrical conductors. The transmitted distance can be anywhere between a few meters (for example, a television's remote control) and thousands of kilometres (for example, radio communication). Some of the devices used for wireless communication are cordless telephones, mobiles, GPS units, wireless computer parts, and satellite television.

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III. MECHANICAL ENGINEERING: Mechanical engineering is a diverse subject that derives its breadth from the need to design and manufacture everything from small individual parts and devices (e.g., microscale sensors and inkjet printer nozzles) to large systems (e.g., spacecraft and machine tools). The role of a mechanical engineer is to take a product from an idea to the marketplace. The mechanical engineer needs to acquire particular skills and knowledge. He/she needs to understand the forces and the thermal environment that a product, its parts, or its subsystems will encounter; to design them for functionality, aesthetics, and the ability to withstand the forces and the thermal environment they will be subjected to; and to determine the best way to manufacture them and ensure they will operate without failure. Perhaps the one skill that is the mechanical engineer's exclusive domain is the ability to analyze and design objects and systems with motion. To put it simply, mechanical engineering deals with anything that moves, including the human body, a very complex machine. Mechanical engineers learn about materials, solid and fluid mechanics, thermodynamics, heat transfer, control, instrumentation, design, and manufacturing to understand mechanical systems. Specialized mechanical engineering subjects include biomechanics, cartilage-tissue engineering, energy conversion, laser-assisted materials processing, combustion, MEMS, microfluidic devices, fracture mechanics, nanomechanics, mechanisms, micropower generation, tribology (friction and wear), and vibrations.

Some of the specializations of mechanical engineering are:

1. INDUSTRIAL ENGINEERING/ MANAGEMENT: Industrial engineers (IEs) are responsible for designing integrated systems of people, machines, material, energy, and information. An industrial engineer may be responsible for the quality of automobiles coming off the end of a manufacturing line, the scheduling of a hospital's emergency room, or even designing a better cockpit to improve the performance of a fighter pilot. Industrial engineers figure out how to do things better. They engineer processes and systems that improve quality and productivity. They work to eliminate waste of time, money, materials, energy, and other resources. This is why more and more companies are hiring industrial engineers and then promoting them into management positions.

2. MANUFACTURING AND PRODUCTION ENGINEERING: Manufacturing is the process of converting raw materials into products. A major activity of mechanical engineers is studying and working with various production methods and techniques, integrating creative design activities into actual fabricated products. The emphasis in the manufacturing program is to provide hands-on experience with state-of-the-art and computer-integrated processes and manufacturing methods. Laboratories have state-of-the-art manufacturing equipment for conventional and non-traditional machining, three-dimensional measurement, and plastic injection molding. Computer-oriented manufacturing is also an emphasis of the program. A manufacturing engineer will have a solid background in manufacturing processes and systems as well as in statistics, design, controls, and applications of microprocessors.

3. THERMAL ENGINEERING: This area of interest emphasizes the fundamentals of heat transfer and thermodynamics and their application to the design of advanced engineering systems. The objective of this program of study is to introduce the fundamental processes of heat transfer and thermodynamics in complex engineering systems to enable more efficient, cost effective, and reliable designs with less environmental pollution and impact. An understanding of heat transfer and thermodynamics is required for the design of efficient, cost-effective systems for power generation (including advanced energy conversion systems), propulsion (including combustion engines and gas turbines), heat exchangers, industrial processes, refining, and chemical processing. This area of interest is important to many industries-aerospace, defense, automotive, metals, glass, paper, and plastic-as well as to the thermal design of electronic and computer packages.

4. ENGINEERING MANAGEMENT: Engineering management is a unique educational path that specifically addresses the skills and requirements that engineers need to become better leaders and engineering team managers. Leadership is especially important in the engineering profession, where scientists and engineers often work as a part of a cross-disciplinary team. Each member of the team brings his or her own unique expertise to the group, working on a small piece of the larger process or system. Ensuring

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the coordination and communication between these individuals is a key responsibility of the team leader and is vital to project success.

5. ROBOTICS: Roboticists develop man-made mechanical devices that can move by themselves, whose motion must be modelled, planned, sensed, actuated and controlled, and whose motion behaviour can be influenced by “programming”. Robots are called “intelligent” if they succeed in moving in safe interaction with an unstructured environment, while autonomously achieving their specified tasks.

6. AUTOMOBILE ENGINEERING: Automobile engineers design, test, develop and manufacture automotive products such as heavy and light vehicles. They help the automotive industry to meet new challenges, for example, making sure that vehicles are safe, environmentally friendly and fuel-efficient. Designing and developing a vehicle involves a very wide range of engineering knowledge. For example, automobile engineers use their knowledge of mechanical engineering, combustion, vehicle structures and aerodynamics.

7. INDUSTRIAL DESIGN: Industrial design (ID) is the professional service of creating and developing concepts and specifications that optimize the function, value and appearance of products and systems for the mutual benefit of both user and manufacturer. Industrial designers develop these concepts and specifications through collection, analysis and synthesis of data guided by the special requirements of the client or manufacturer. They are trained to prepare clear and concise recommendations through drawings, models and verbal descriptions. Industrial design services are often provided within the context of cooperative working relationships with other members of a development group. Typical groups include management, marketing, engineering and manufacturing specialists. The industrial designer expresses concepts that embody all relevant design criteria determined by the group.

8. MECHATRONICS: Mechatronics is a synergistic combination of precision engineering, electronic control and mechanic systems. It is the science that exists at the interface among the other five disciplines Mechanics, Electronics, Informatics, Automation, and Robotics. It includes programmable electronic devices and electromechanical systems for embedded, distributed structure of the sensors, processing signals, actuators and communications

9. FLUID MECHANICS: This field of study is based on the fundamentals of fluid mechanics and their broad range of applications in the biomedical and engineering arenas. Areas of current research include blood circulation in the body and its potential role in the regulation of normal physiological function and in the development of disease; groundwater and atmospheric flows and their implications for pollutant transport and environmental concerns; aerodynamic flow around transportation vehicles and its impact on vehicle performance; and flow in combustion engines and other energy systems with considerations of efficiency and environmental impact. These areas are investigated both experimentally and computationally.

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10. GROUND VEHICLE SYSTEMS: An aspect of mechanical engineering is the design of surface vehicles. The emphasis in on the design of more environmentally benign vehicles that can provide transportation while using fewer resources. Innovations in this field require competence in vehicle dynamics, propulsion and engine concepts, control of power transmission, and construction of lightweight manufacturable structures and systems. Alternatively fueled power systems, including electric drives, are also studied.

11. MACHINE DESIGN AND SOLID MECHANICS: Machine Design: design and analysis of machine components or structures. Mechanics of Materials is a branch of mechanics that studies the relationships between the loads and deformations of solid materials Material Engineering. The principle objective is to determine the stresses, strains and displacements in structure and their components.

12. MECHANICAL DESIGN: The creation and improvement of products, processes, or systems that are mechanical in nature are the primary activities of a professional mechanical engineer. The development of a product, from concept generation to detailed design, manufacturing process selection and planning, quality control and assurance, and life-cycle considerations are areas of study and specialization in the area of mechanical design. Solutions to such major social problems as environmental pollution, lack of mass transportation and of raw materials, and energy shortages will depend heavily on the engineer's ability to create new types of machinery and mechanical systems. The engineer-designer must have a solid and relatively broad background in the basic physical and engineering sciences and have the ability to solve a variety of problems. In addition to having technical competence, the designer must be able to consider the socio-economic consequences of a design and its possible impact on the environment. Product safety, reliability and economics are other considerations.

13. SYSTEM DYNAMICS AND CONTROL: Engineers are increasingly concerned with the performance of integrated dynamics systems in which it is not possible to optimize component parts without considering the overall system. System dynamics and control specialists are concerned with the modeling, analysis, and simulation of all types of dynamic systems and with the use of automatic control techniques to change the dynamic characteristics of systems in useful ways. The emphasis in this program is on the physical systems that are closely related to mechanical engineering, but the techniques for studying these systems apply to social, economic, and other dynamic systems.

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14. TRANSPORTATION SYSTEMS: An important aspect of mechanical engineering is the planning, design, and operation of transportation systems. As society recognizes the increasing importance of optimizing transportation systems to minimize environmental degradation and energy expenditure, engineers will need to consider major innovations in the way people and goods are moved. Such innovations will require competence in vehicle dynamics, propulsion and control, and an understanding of the problems caused by present-day modes of transportation.

15. ENERGY MANAGEMENT: The energy management field is experiencing unprecedented growth, due to the restructuring of the utility industry, the automation of building management systems, and increasing demand for energy services. There is a growing need for executives with skills in energy, environmental, and facilities management.

IV. CIVIL ENGINEERING: In general, it is the branch of engineering which deals with the planning, design, construction and maintenance of the structures like buildings, roads, bridges, canals, dams, water supply and treatment systems etc. The civil engineering profession recognizes the reality of limited natural resources, the desire for sustainable practices (including life-cycle analysis and sustainable design techniques), and the need for social equity in the consumption of resources. The basic responsibilities of a civil engineer is to plan and design a structure and analyze its various aspects, make a regular inspection in the site to ensure that the construction is going according to the plan and to make the necessary amendments in the project if required during the course of construction. Civil engineer has to make sure that the project is cost effective and structure is of required strength and safety. The civil engineer holds the safety, health, and welfare of the public paramount. Civil engineering projects and systems should compliance with governmental guidelines and regulations; should be built economically to function properly with a minimum of maintenance and repair while withstanding anticipated usage and weather; and should conserve energy and allow hazard-free construction while providing healthful, safe, and environmentally sound utilization by society. It has a broader spectrum and comprises of many sub-disciplines under it.

1. TRANSPORTATION ENGINEERING: It is the transportation engineer's responsibility to plan, design, build, operate and maintain these systems of transport, in such a way as to provide for the safe, efficient and convenient movement of people and goods. Increasing environmental concerns have revived an interest in the development and management of public transportation systems. Professional activities can range from road and transit design and operation at the urban scale, to railroad, seaway and airport location, construction and operation at the regional and national scale. They focus on automobile infrastructures, although it also encompasses sea, air and rail systems. Automobile infrastructures can be split into the traditional area of highway design and planning, and the rapidly growing area of traffic control systems. The transportation engineer faces the challenge of developing both network links and major terminals to satisfy transportation demands, with due regard for the resultant land-use, environmental and other impacts of these facilities.

A. HIGHWAY ENGINEERING: branch of civil engineering that includes planning, design, construction, operation, and maintenance of roads, bridges, and related infrastructure to ensure effective movement of people and goods. Highway planning involves the estimation of current and future traffic volumes on the road network. For purposes of design, traffic volumes are needed for a representative period of traffic flow. The capacity is the maximum theoretical traffic flow rate that a highway section is capable of accommodating under a given set of environmental, highway, and traffic conditions. The capacity of a highway depends on factors such as the number of lanes, lane width, effectiveness of traffic control systems, frequency and duration of traffic incidents, and efficiency of collection and dissemination of highway traffic information.

B. BRIDGE ENGINEERING: A Branch of Civil Engineering

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C. TRAFFIC ENGINEERING: Traffic Engineering is that phase of engineering which deals with the planning, geometric design and traffic operations of roads, streets, and highways, their networks, terminals, abutting lands and relationships with other modes of transportation for the achievement of safe, efficient, and convenient movement of persons and goods. Traffic Engineering applies engineering principles to help solve transportation problems, and brings into play a knowledge of psychology and habits of users of the transportation systems

D. TRANSIT ENGINEERING: Railway engineering is a discipline within Civil Engineering that looks at the design, maintenance, and behavior of the railroad track infrastructure. The railway infrastructure includes track, bridges, and other infrastructure elements for passenger and freight railway and transit systems (both heavy and light rail). Railway engineering includes the short and long term behavior of the track structure and its major components under traffic and environmental loading, both static and dynamic. It also includes the dynamic interaction between the vehicles and the track structure, the localized interaction between the wheel and the rail, the interaction between each of the elements of the track structure and the long term behavior of the infrastructure under railroad and/or transit operations.

2. STRUCTURAL ENGINEERING: Structural engineers are concerned with the conception, analysis, design and construction of components or assemblies to resist loads arising from internal and external forces. Solid mechanics is the study of the distribution of stresses that a given load produces when applied to a solid element, and the calculation of the resulting strains, given the characteristics of the materials that make up that element. The application of solid mechanics enables the structural engineer to assemble elements, such as beams and columns, into a structure that will resist both static and dynamic loads, such as gravity, wind, snow and earthquakes. In addition to steel and concrete, new materials that are being developed and used in structural engineering include reinforced plastics and polymers. The rehabilitation of existing structures weakened by corrosion continues to be an important task. While typical civil engineering structures include large buildings, bridges and dams, graduates with a specialization in structural engineering may also be concerned with designing the structures of machinery, vehicles, aircraft and spacecraft. Employment opportunities include work with consulting structural engineers, construction companies, building development companies, engineering departments of private corporations, aircraft and aerospace related companies, public utilities, and government agencies

a. Building Structural

b. Bridge Structural

3. ENVIRONMENTAL ENGINEERING: Environmental engineers study water, soil and air pollution problems, and develop technical solutions needed to solve, attenuate or control these problems in a manner that is compatible with legislative, economic, social and political concerns. Civil engineers are particularly involved in such activities as water supply and sewerage, management of surface water and groundwater quality, remediation of contaminated sites and solid waste management. The activities of such

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engineers include, but are not limited to, the planning, design, construction and operation of water and wastewater treatment facilities in municipalities and industries, modelling and analysis of surface water and groundwater quality, design of soil and remediation systems, planning for the disposal and reuse of wastewaters and sludges, and the collection, transport, processing, recovery and disposal of solid wastes according to accepted engineering practices. Environmental engineers are called upon to play an important role in environmental protection, because engineering solutions are required to meet the environmental standards set by legislation. Consulting firms, municipalities, government agencies, industries and non-governmental organizations and specialized contractors are potential employers for civil engineers with a specialization in environmental engineering.

4. GEOTECHNICAL ENGINEERING: Geotechnical engineering is the study of the behaviour of soils under the influence of loading forces and soil-water interactions. This knowledge is applied to the design of foundations, retaining walls, earth dams, clay liners, and geosynthetics for waste containment. The goals of geotechnical engineers could range from the design of foundations and temporary excavation support, through route selection for railways and highways, to the increasingly important areas of landfill disposal of wastes and groundwater contamination. As such, the geotechnical engineer is involved in field and laboratory investigations to determine the engineering properties of site soils and other geomaterials and their subsequent use in the analytical study of the problem at hand. Recent computational and computer advances are extending our ability to predict the behaviour of soil and soil-water systems under a wide variety of conditions. In recent years, the activities of geotechnical engineers have also involved geo-environmental engineering. Geo-environmental engineers design strategies for the clean-up of contaminated soils and groundwater and develop management systems for contaminated sites.

5. TUNNEL ENGINEERING: The construction of tunnels under wide and deep waterways or rugged mountains requires special consideration to the design as well as the execution. Some of the technical and practical challenges related to the planning, design and construction are Topography, Geo technical Survey, Knowledge of TBM's, Durability, weather patterns, Tunnel Ventilation, safety etc.

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6. CONSTRUCTION MANAGEMENT: It is the process of overseeing projects for residential, commercial and industrial construction. Construction managers direct and coordinate projects to maximize efficiency in the building process. Depending on their level of experience, they may supervise an entire project, or a portion of one. Construction managers schedule and coordinate construction processes including licensing, material supply chains, safety code compliance and both budget and timeline projections. typically they do not perform actual construction tasks. Depending on the company, this position may also be referred to as a project manager, construction superintendent, project supervisor or general contractor. These managers supervise the construction process from initial design to the final walk-through, making sure each stage gets completed on time and on budget. They often coordinate with many different stakeholders: owners, engineers, architects and craftspeople. Construction managers also find, contract with and supervise tradespeople for specific tasks such as painting, plumbing and carpeting.

In a very large project there may also be multiple construction managers who work together towards the final goal. For example, in the construction of a large industrial complex there may be a site manager, landscaping manager, building systems manager and structural manager.

7. HYDRAULIC AND WATER RESOURCES ENGINEERING: Water resources engineering is the quantitative study of the hydrologic cycle -- the distribution and circulation of water linking the earth's atmosphere, land and oceans. Surface runoff is measured as the difference between precipitation and abstractions, such as infiltration (which replenishes groundwater flow), surface storage and evaporation. Applications include the management of the urban water supply, the design of urban storm-sewer systems, and flood forecasting. Hydraulic engineering consists of the application of fluid mechanics to water flowing in an isolated environment (pipe, pump) or in an open channel (river, lake, ocean). Civil engineers are primarily concerned with open channel flow, which is governed by the interdependent interaction between the water and the channel. Applications include the design of hydraulic structures, such as sewage conduits, dams and breakwaters, the management of waterways, such as erosion protection and flood protection, and environmental management, such as prediction of the mixing and transport of pollutants in surface water. Hydroelectric-power development, water supply, irrigation and navigation are some familiar applications of water resources engineering involving the utilization of water for beneficial purposes. More recently, concern for preserving our natural environment and meeting the needs of developing countries has increased the importance of water resources engineering.

V) CHEMICAL ENGINEERING: The aim of this specialization is to train students in the fundamentals of industrial production, either on laboratory or industrial pilots, or in virtual reality using industrial software which enables scientific and economic facts and the constraints imposed by industrial security to be considered simultaneously. The fine chemistry, high technology, clean processes and environmental remediation, catalysis and petrochemistry sectors are all treated. Considering the major issues of the scientific and industrial worlds, an education which links academic knowledge and engineering science is necessary for those who wish, in the medium or long term, to find employment in the industry. In particular, this means giving students the tools necessary for an integrated approach to processes, including everything from their simulation, conduct and optimization to management of their environment in terms of company knowledge, chemical risk management and environmental impact. Certain types of processes, chosen for their innovation factor, their social impact and their employment catchment area are developed in more detail in specialized papers.

1. POLLUTION CONTROL ENGINEERING:

2. BIOCHEMICAL ENGINEERING: Biochemical Engineering is a profession like medicine. It enhances the quality of our lives by defining ways in which new biological discoveries can be sensitively translated into practical realities. n the next decade and beyond, the contributions of biochemical engineers to the national and international community will be vital not only in the area of new medicines where we are pioneering

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new degrees but also for more nutritious foods, novel materials from renewable sources and improved approaches to reducing and dealing with environmental pollution.

3. POLYMER SCIENCE & ENGINEERING 4. MATHEMATICAL ANALYSIS, STATISTICS AND CONTROL 5. TRANSPORT PROCESS 6. ENERGY ECONOMIC AND ENGINEERING 7. SOFT MATERIALS [COLLOIDS, FOAMS ETC) 8. MICROCHEMICAL AND MICROFLUIDIC SYSTEM 9. BIOMOLECULAAR ENGINEERING

ii. Petroleum Engineering

iii. Biomedical Engineering

iv. Textile Engineering

v. Nuclear Engineering

vi. Bio Engineering

vii. Geo Engineering

viii. Mining Engineering

ix. Wind Engineering

x. Dairy Engineering

xi. Ceramic Engineering

SCIENCES

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I. BIOLOGY

1. Integrative Biology

2. Plant Biology

3. Zoology

4. Animal Biology

5. Evolutionary

6. Ecology and Conservation Biology

7. Neuro Biology

8. Behavioural Biology

9. Quantitative Biology

10. Microbiology

II. CHEMISTRY

1. Applied Chemistry

2. Bio Chemistry

3. Analytical Chemistry

4. Pharmaceutical Chemistry

5. Industrial Chemistry

6. Organic Chemistry

7. Inorganic Chemistry

8. Environmental Chemistry

III. PHYSICS

1. Astrophysics and General Relativity

2. Atomic, Molecular and Optical Physics

3. Biophysics

4. Complex Systems

5. Condensed Matter Physics

6. High Energy Particle Physics

7. Nuclear Physics

IV. CELLULAR & MOLECULAR BIOLOGY

V. IMMUNOLOGY

VI. CANCER BIOLOGY

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VII. BIO TECHNOLOGY

1. Plant Biotechnology

2. Animal Biotechnology

VIII. GENETIC ENGINEERING

IX. FOOD SCIENCE

X. DAIRY SCIENCE

PHARMACY

i. Pharmacology

ii. Pharmaceutics

iii. Pharmacotherapy

iv. Nuclear Pharmacy

v. Pharmaceutical Sciences

vi. Pharmacy Administration

vii. Drug Discovery

viii. Cosmetic Science

ix. Regulatory Affairs

BUSINESS

i. MBA

ii. Financial Engineering

iii. Management

iv. Marketing

v. Economics

vi. International Business

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vii. Banking and Finance

viii. Human Resources & Labour Relations

ix. Project Management

x. Operations Management

xi. Tourism and Hospitality

xii. Sustainability

xiii. Casino Management

xiv. Sports Management

xv. Leisure Management

MATHEMATICS AND STATISTICS

i. Mathematics

ii. Actuarial Science

iii. Statistical Sciences

FINE ARTS

i. Film & Music

ii. Photography

iii. Painting

iv. Direction and Cinematography

v. Digital Effects

ARCHITECTURE

i. Urban Planning

ii. Landscape Architecture

iii. Interior Design

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iv. Sustainable Architecture

v. Conservation Architecture

vi. Design/ Build

HUMANITIES

I. HISTORY

a. American History

b. Western Civilization

c. Empires and Colonialism

d. Intellectual History

II. POLITICAL SCIENCE

III. GEOGRAPHY

IV. PSYCHOLOGY

a. Marriage Psychology

b. Child Psychology

c. Biopsychology

d. Cognitive Psychology

e. Counseling & Clinical Psychology

f. Developmental Psychology

g. Industrial / Organizational Psychology

h. Social Psychology

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