Bharati Vidyapeeth
(Deemed to be University)
College of Engineering Pune

List of Program Educational Objectives, Program Outcomes and Program Specific Outcomes

Sr. no	Branch	Course	Program Details	Statements
1.	Chemical	UG/B. Tech	Program Educational Objectives	1. Practice Chemical Engineering in conventional, multidisciplinary and emerging fields 2. Pursue advanced studies or other forms of continuing education 3. Demonstrate professionalism, ethical and social responsibility and desire for lifelong learning
2.			Program Outcomes	Engineering Graduates will be able to: 1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems. 2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. 3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. 4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. 5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools

				including prediction and modeling to complex engineering activities with an understanding of the limitations.
				6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
				7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
				8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
				9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
				10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
				11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
				12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
3.			Program Specific Outcomes	1. Utilize the fundamentals of unit operations and unit processes for the design and development of chemical products 2. Implement the pollution abatement methodologies in chemical and allied industries 3. Adopt sustainable energy strategies in professional practice

4.		PG/M. Tech	Program Educational Objectives	1. Pursue career and/or higher studies in chemical engineering and allied thrust areas 2. Undertake fundamental and applied scientific research in chemical engineering, multidisciplinary, and emerging fields **3.** Inculcate leadership and entrepreneurial skills to implement innovative and sustainable technologies in the context of environmental and societal needs
5.			Program Outcomes	A Chemical Engineering post graduate will be able to 1. Independently carry out research/investigation and development work to solve practical problems. 2. Write and present a substantial technical report /document. 3. Demonstrate a degree of mastery over the area as per the specialization of the chemical engineering programme. The mastery should be at a level higher than the requirements in the appropriate bachelor programme.
6.			Program Specific Outcomes	1. Apply the knowledge of advances in chemical engineering for the execution of projects related to chemical and allied areas. 2. Practice chemical engineering by applying professional ethics with due consideration to environmental, societal and safety aspects. **3.** Engage in life-long learning to sustain and enhance practice of chemical engineering.
7.	Civil	UG/B. Tech	Program Educational Objectives	1. To prepare students for career in Civil Engineering profession. 2. To develop a responsible 'Entrepreneur'. 3. To develop the student to cope up with the advancements in Civil Engineering.
8.			Program Outcomes	**The graduants will be able to** 1. apply possessed knowledge of fundamental subjects to Civil

				Engineering problems.
				2. analyze Civil Engineering problems.
				3. design Civil Engineering structures with appropriate consideration to safety, economy ,health and environmental considerations.
				4. solve complex Civil Engineering problems by conducting investigations.
				5. use modern Civil Engineering tools, techniques and software.
				6. apply their professional responsibilities.
				7. understand the impact of professional engineering solutions in societal and environmental contexts.
				8. exhibit professional ethics and norms of engineering practice.
				9. function individually and in teamwork.
				10. communicate effectively in both verbal and written forms.
				11. manage the work and finance of a Civil Engineering projects.
				12. practice the use of lifelong learning
9.			Program Specific Outcomes	1.To prepare students for knowledge of Civil Engineering related to analysis , design and civil engineering practices. 2.To make the students ready to exhibit their professional responsibilities as Entrepreneur. 3. To develop the students to know the latest developments in Civil Engineering
10.		PG/M. Tech	Program Educational Objectives	1. To prepare students for career in Hydraulic Engineering profession. 2. To inculcate innovation, creativity and research approach among the granduants.
11.			Program Outcomes	The post graduate students will be able to 1. Independently carry out research or investigations and development work to solve practical problems 2. Write and present a substantial technical report Demonstrate a degree of mastery over the area of Hydraulic

				Engineering.
12.	Computer	UG/B. Tech	Program Educational Objectives	1. Exhibit competence and professional skills pertinent to the working environment. 2. Continue professional development through available resources and avenues for career growth. 3. • Act with ethical and societal awareness as expected from competent practicing professionals.
13.			Program Outcomes	1. To apply knowledge of computing and mathematics appropriate to the domain. 2. To logically define, analyse and solve real world problems. 3. To apply design principles in developing hardware/software systems of varying complexity that meet the specified needs. 4. To interpret and analyse data for providing solutions to complex engineering problems. 5. To use and practise engineering and IT tools for professional growth. 6. To understand and respond to legal and ethical issues involving the use of technology for societal benefits. 7. To develop societal relevant projects using available resources. 8. To exhibit professional and ethical responsibilities. 9. To work effectively as an individual and a team member within the professional environment. 10. To prepare and present technical documents using effective communication skills. 11. To demonstrate effective leadership skills throughout the project management life cycle. 12. To understand the significance of lifelong learning for professional development.
14.			Program Specific Outcomes	1. To apply fundamental knowledge and technical skills towards solving Engineering problems. 2. To employ expertise and ethical practise through continuing intellectual growth and adapting to the

				working environment.
15.		PG/M. Tech	Program Educational Objectives	1. Apply knowledge of computing and technology to analyse, design and simulate to provide optimized solutions for Complex Problems. 2. Enhance skills and adapt new computing technologies and contribute to research & development either through research or by practice. 3. Engage in Professional and ethical practices in multidisciplinary working environment.
16.			Program Outcomes	1. To acquire, discriminate, evaluate, analyse and synthesise existing and new knowledge in the field of Computer Engineering. 2. To analyse complex engineering problems critically through conducting research in a wider theoretical and practical context. 3. To design and develop optimised solutions by conceptualising and evaluating computer engineering problems. 4. To identify, learn and apply appropriate techniques, and modern engineering tools to solve complex computer engineering problems. 5. Comprehend and prepare effective reports and presentations by adhering to appropriate standards.
17.			Program Specific Outcomes	1. Practise research based knowledge and methods including design of experiments, analysis and interpretation of data and IT tools. 2. Employ competence in creating innovative career paths through lifelong learning towards entrepreneurship, employability and higher studies.
18.	E&TC	UG/B. Tech	Program Educational Objectives	1. To prepare graduates for successful career in Electronics & Telecommunication and allied fields. 2. To prepare the graduates for their career aspirations towards higher studies in Engineering and Management. 3. To prepare the graduates to become successful Entrepreneurs.

19.				Program Outcomes	BTech (E&TC) Graduate will be able to
					1. Apply the knowledge of Mathematics, Science and Engineering fundamentals to solve Electronics and Telecommunication engineering problems.
					2. Identify, formulate and analyze complex Electronics and Telecommunication engineering problems.
					3. Design systems, components and processes in the field of Electronics and Telecommunications that conform to the given specifications and cost constraints
					4. Configure, apply test conditions and evaluate outcomes of experimental Electronics and Telecommunication systems
					5. Select and use appropriate modern engineering tool for design and analysis in Electronics and Telecommunication, with an understanding of the constraints.
					6. Work cooperatively, respectfully, creatively and responsibly as a member of a team
					7. Communicate effectively using verbal, written and graphical skills.
					8. Have awareness of societal, health, safety, legal, and cultural issues and understand responsibilities relevant to professional engineering practices.
					9. Understand the norms of expected behavior in engineering practice and their underlying ethical foundations.
					10. Have awareness of environmental concerns and their importance in developing sustainable Electronics and Telecommunication engineering solutions.
					11. Apply Engineering and Management principles for project work, as an individual or in a team.
					12. Acquire and apply required information Independently as a process of life - long learning.
20.				Program Specific	1. Possess an ability to apply and demonstrate the usage of hardware

			Outcomes	and software platform for a variety of real-world applications keeping up with societal, environmental issues with professional ethics. 2. Develop an ability to apply mathematical and statistical methods for analysis and design of Electronic and Communication system.
21.	Electrical	UG/B. Tech	Program Educational Objectives	1. To develop professional skills in students to provide solution to problems in electrical and allied fields. 2. To develop students with conducive learning attitude for lifelong learning. 3. To demonstrate behavioural skills and ethics.
22.			Program Outcomes	1. Apply knowledge of mathematics, basic science and engineering fundamentals to solve complex problems in electrical engineering. 2. Identify problem in electrical systems based on available data and interpret the results. 3. Design electrical systems that meet specified needs with safety considerations. 4. Design and conduct experiments, analyze and interpret data. 5. Use modern electrical engineering softwares and tools. 6. Create awareness of electrical engineering solutions for social benefit considering current and upcoming tools / technologies. 7. Understand the impact of engineering solutions in a global, economic, environmental context. 8. Demonstrate ethics and professional abilities. 9. Work effectively as an individual and as a member in a diverse team. 10. Communicate effectively in both written and verbal form. 11. Demonstrate knowledge and understanding of engineering and management principles for execution of projects. **12.** Recognize the need and ability to learn technological changes.
23.			Program Specific Outcomes	1. Able to apply fundamental knowledge of Electrical machines, Power systems, Power electronics, Control system (all electrical courses) to identify, formulate and investigate various real time problems of

				electrical sector industries and allied industries.
				2. Able to apply recent techniques along with modern and appropriate software tools (like MATLAB, ETAP, Ansys) for designing, simulating and analyzing electrical systems as well as automation techniques to engage in lifelong learning.
				3. Able to apply knowledge of ethical and project management principles to work in a team as well as lead a team as socially responsible member. Development of sustainable technological solutions for projects related to electrical and allied fields.
24.		PG/M. Tech	Program Educational Objectives	1. To acquire in depth knowledge of power systems with ability to identify, analyze, design and solve complex and emerging problems of power system engineering
				2. To prepare the graduates with competency to effectively communicate and coordinate in multidisciplinary team of society for professional growth.
				3. To engage in lifelong learning through research , independent project , latent trends in technology.
25.			Program Outcomes	1. Acquire in depth knowledge of power system to understand the impact of power engineering solution to global environmental solution.
				2. Analyze critically power system models, operational behavior with mathematical equations and synthesize the information and Apply fundamental concepts to analyze practical problems in power system and think to solve the problem with optimum solution
				3. Gain knowledge through literature survey, experimentation, analyze and interpret data, apply appropriate research methodologies, select, learn and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex engineering
				4. Design a system, component, or process to meet the desired needs with realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and

				sustainability and demonstrate higher order skills
				5. Comprehend and write effective reports, technical paper and design documentation by adhering to appropriate standards, make effective presentations.
26.			Program Specific Outcomes	1. Apply principles of basic sciences in engineering including physics, chemistry, environmental science, mathematics (differential equations, discrete mathematics, linear algebra and complex variables) and laboratory skills for execution of projects in electrical and allied systems.
				2. Model, analyze and design physical systems, components or processes related to Electrical engineering and allied fields by considering professional ethics and safety measures to environment and society.
				3. Develop engineering professional for lifelong learning process in the core area of power system, by giving them the state of the art technology and the learning process.
27.	Electronics	UG/B. Tech	Program Educational Objectives	1. Solve real-life engineering problems exhibiting a solid foundation in mathematical, scientific and engineering fundamentals.
				2. Exhibit professional and ethical outlook, effective communication, teamwork, multidisciplinary approach and an ability to relate engineering issues to broader social context.
				3. Apply analysis, design, optimization and implementation skills in order to formulate and solve Electronics Engineering problems
28.			Program Outcomes	1. Apply basic knowledge of mathematics, science & engineering.
				2. Identify, formulate, analyze and solve engineering problems.
				3. Design and develop systems/ processes to meet the desired specifications.
				4. Use of research based knowledge to design and conduct experiments, analysis and interpret data to provide valid conclusions.
				5. Apply the techniques, resources and modern engineering tools required for Electronics Engineering applications.

				6. Understand effect of engineering solutions in global, economic, health, safety & societal context. 7. Understand the impact of engineering solutions on society to be aware of contemporary issues. 8. Shoulder professional and ethical responsibilities for societal development. 9. Work as effective and efficient team member of the team or leader. 10. Communicate effectively. 11. Manage projects in Electronics and multi disciplinary environment. 12. Engage in lifelong learning.
29.			Program Specific Outcomes	1. Develop an ability to apply different mathematical and statistical methods for analysis and design of subsystems/ processes for a variety of applications considering the concerns for societal & environment wellbeing. 2. Possess an ability to apply and demonstrate the usage of hardware and software platforms for a variety of real world applications.
30.		PG/M. Tech	Program Educational Objectives	1. Inculcate research and development culture amongst students and make them capable of solving design problems in the field of VLSI Technology. 2. To enhance the engineering knowledge and expose him/her to the state-of-the art in VLSI technology thus making him/her employable in VLSI and allied fields. 3. .To build strong sense of ethical work culture in multidisciplinary domains to cater to the socio-economic progress of the country.
31.			Program Outcomes	1. Acquire in-depth knowledge of Electronics-VLSI and related design to contribute in the state-of-art technology. 2. Identify, analyze, design, develop to conduct experiments related to VLSI Technology and hence interpret the data. 3. Ability to design and implement electronic circuits to meet desired needs within realistic constraints such as economic, environmental, social, ethical and sustainability.

				4. Identify realistic problems, extract information through literature survey, conduct experiments, compile the findings and perform analysis of the final results of the experimentation. 5. Use of different software tools in the domain of VLSI, analysis and verification such as design entry, synthesis, functional and timing simulation, floor planning, place and route and RTL schematic. 6. Ability to visualize, function, manage and work with multidisciplinary teams. 7. Demonstrate knowledge and understanding of VLSI engineering and study its societal impact by considering economical and financial factors. 8. Communicate effectively through discussions, presentations and reports both technically and the society at large. 9. Recognize the need to engage in lifelong learning through self and continuing education. 10. Demonstrate knowledge of contemporary issues in the area of VLSI design for the development of society. 11. Manage projects related to Electronics-VLSI in multidisciplinary environments.
32.	Information Technology	UG/B. Tech	Program Educational Objectives	The B. Tech Information Technology Programme is preparing the graduates: 1. To be a skilled resource for industry pertaining to Information Technology solutions. 2. To nurture themselves for demonstrating team abilities and alignment with technological upgrades. 3. Exhibit social responsibilities by following ethical practices in professional pursuit.
33.			Program Outcomes	1. Apply logical and programming skills to solve computational problems. 2. Apply knowledge of mathematics, and computer science to analyze computer based information system.

				3. Design and develop applications with appropriate consideration of societal needs.
				4. Analyze and compare relative merits of alternative software design approaches to provide conclusion.
				5. Demonstrate functional skills of modern IT tools and techniques for modeling and implementation.
				6. Possess awareness of social and cultural impact of computing on individuals, organizations, and society.
				7. Apply software engineering methodologies for sustainable development.
				8. Follow ethical and legal practices related to functioning of IT industry.
				9. Perform as a team player to accomplish a common goal.
				10. Convey technological concepts through significant documentation and presentation skills.
				11. Apply management skills and techniques for creating time-bound projects.
				12. Exhibit lifelong learning by upgrading to new IT practices and technology.
34.	Mechanical	UG/B. Tech	Program Educational Objectives	1. To fulfill need of industry and society with theoretical & practical knowledge
				2. To perform research, innovation, lifelong learning and continued professional development
				3. To fulfill professional ethics and social responsibilities
35.			Program Outcomes	1. Apply knowledge of mathematics, science and engineering fundamentals for solving complex engineering problems
				2. Identify the need, plan and conduct experiments, analyze data for improving the mechanical processes.
				3. Design and develop mechanical systems considering social and environmental constraints.
				4. Design and develop a complex mechanical system using research

				based knowledge, advanced mathematical, statistical tools and techniques. 5. Use information technology (it) tools for prediction and modeling of routine activities to enhance the work performance. 6. Know social responsibilities while doing professional engineering practices. 7. Familiarize with eco-friendly, sustainable and safe working environment. 8. Take into account professional ethics while designing engineering systems. 9. Work efficiently as a group leader as well as an individual. 10. Communicate in written and verbal form with subordinates and supervisors. 11. Apply project and finance management techniques in multidisciplinary environments. 12. Take interest in higher education and update the knowledge.
36.			Program Specific Outcomes	1. Apply the knowledge of thermal, design, manufacturing engineering and computational sciences to solve Mechanical Engineering problems. 2. Apply Mechanical Engineering principles for research, innovation and develop entrepreneurial skills. 3. Apply concepts of Mechanical Engineering to assess societal, environmental, health, safety issues with professional ethics.
37.		PG/M. Tech	Program Educational Objectives	1. To fulfil the need of industry and society with theoretical and practical knowledge in the field of Computer Aided Design and Computer Aided Manufacturing and allied areas. 2. Research innovation lifelong learning and continued professional development in the field Computer Aided Design and Computer Aided Manufacturing and allied areas. 3. To fulfil the professional ethic and social responsibility while in working in the field of Computer Aided Design and Computer Aided Manufacturing and allied areas.

38.			Program Outcomes	A graduate of M. Tech. (CAD/CAM) program : 1. Should be able to independently carry out research /investigation and development work to solve complex practical problems in computer aided design and manufacturing. 2. Should be able to write and present a detail technical report and research article in Computer Aided Design and Computer Aided Manufacturing. 3. Students should be able to demonstrate expertise in the field of Computer Aided Design and Computer Aided Manufacturing.
39.			Program Specific Outcomes	A graduate of M.Tech(CAD/CAM) program : 1. Should be able to carry out modeling , simulate and analyse complex engineering system. 2. Should be able to apply knowledge of computer aided manufacturing to increase the productivity.
40.	Production	UG/B. Tech	Program Educational Objectives	1. Create innovative Production Engineers. 2. Pursue lifelong learning for professional development 3. To develop leadership qualities.
41.			Program Outcomes	1. Apply knowledge of mathematics, science and engineering In Manufacturing industries. 2. Identify the need, plan and conduct experiments, analyze data for improving the manufacturing processes. 3. Design manufacturing systems that meet desired specifications and requirements. 4. Design and develop complex manufacturing system using statistical and advanced mathematical tools. 5. Use IT tools for prediction and modeling of production engineering activities with an understanding of the limitations. 6. Design Eco-friendly, sustainable and safe manufacturing system. 7. Be professionally and ethically responsible to apply engineering tools to satisfy society needs. 8. Perform as a member or a leader in multidisciplinary teams. 9. Communicate in written and verbal form. 10. Manage projects in multidisciplinary environment as a member or

				leader of a team exhibiting his knowledge, understanding and managerial skills.
				11. Engage in independent and life-long learning.
42.	Nano Technology	PG/M. Tech	Program Educational Objectives	1. To fulfil the need industry and society with theoretical and particle knowledge in the field nanotechnology and allied areas. 2. Research innovation and lifelong learning and continued professional development in the in the field nanotechnology and allied areas. 3. To fulfil professional ethics and social responsibilities while working in the field nanotechnology and allied areas.
43.			Program Outcomes	A graduate of M. Tech. Nanotechnology program should be: 1. Able to independently carry out research /investigation and development work to solve nanotechnology related practical problems.. 2. Able to write and present a substantial technical report and research articles. 3. Able to demonstrate a expertise over the area nanotechnology.
44.			Program Specific Outcomes	A graduate of M. Tech. Nanotechnology programme 1. Should be able to perform synthesis of Nano materials. 2. Should be able to details characterisation of Nano materials. 3. Should be able to develop product based on principles of nanotechnology.
45.	CSBS	UG/B. Tech	Program Educational Objectives	1. Prevail technical competency to concord the industry engrossment. 2. Assimilate business management skills. 3. Instigate business level innovation with societal consideration.
46.			Program Outcomes	1. Demonstrate logical and programming skills through comprehensive programming foundation. 2. Apply knowledge of mathematics, computer engineering and basic science to comprehend and solve real world problems.

				3. Develop software applications and processes for complex problems to provide efficient solutions by assessing its environmental, social and ethical constraints.
				4. Investigate and solve complex computing problems with alternate solutions.
				5. Use functional skills of modern IT tools and techniques for engineering activities.
				6. Understand the social and cultural impact of computing on society.
				7. Provide optimized computational solutions that apprehend the societal and environmental aspects.
				8. exhibit the professional, ethical and legal responsibilities related to industry.
				9. Perform as an individual and efficient team player to accomplish a goal.
				10. Present professional concepts through effective communication skills and documentation.
				11. Demonstrate management skills for developing time-bound projects within the available budget and resources.
				12. Develop the ability of life long learning for new IT practices.