

GURU KASHI UNIVERSITY



**Bachelor of Technology in Civil Engineering
Single Major**

Session: 2025-26

Faculty of Engineering & Technology

Graduate Attributes of the Programme (B. Tech Civil Engineering): -

Type of learning outcomes	The Learning Outcomes Descriptors
Learning outcomes that are specific to disciplinary/interdisciplinary areas of learning	Graduates should be able to demonstrate the acquisition of:
	technical & analytical skills and research promotion in the field of Civil Engineering to identify, formulate, analyze, and solve complex engineering problems in order to develop sustainable construction and planning solutions in broader economic, societal, and environmental contexts.
	practical, professional, and procedural knowledge required for carrying out planning and construction related tasks, which will lead the students to obtain the entrepreneurship skills
	skills of innovation, creative and critical thinking that enable student to follow systematic ways for analyzing and finding innovative solutions in the field of transportation, geotechnical, structural, construction management, materials, planning, water resources, and field survey.
	comprehensive knowledge and understanding of the fundamentals and theories of science, engineering, and mathematics and advanced specialized knowledge in Civil Engineering.
Generic learning outcomes	The graduates should be able to demonstrate the ability of creativity, critical thinking, and innovation in solving the complex problems that do not have simple solutions
	The graduates should be able to demonstrate the skills of excellent communication, writing, and understanding the technical documents in more than one recognized language.
	<i>Coordinating/ collaborating with others:</i> working effectively either individually or in groups, with the ability to lead work teams flexibly and effectively and having the skills of listening and communicating effectively.
	Commitment to professional ethics that are compatible with societal and cultural values, participation in finding valuable solutions to some societal issues, and a commitment to responsible citizenship.
	Having the attribute of lifelong learning to keep up with the latest developments in the field of specialization, as well as to use modern digital technologies and applications to analyze and process data and information.
	The graduates should be able to demonstrate the ability to identify and to address their own educational needs in

	a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge. The graduates should be able to evaluate critically and apply knowledge, methods and skills through self-identified sources and self-directed learning for locating, accessing, and utilizing relevant information sources as related to civil engineering.
	The graduates should be able to demonstrate the ability of mitigating the effects of environmental degradation, climate change, and pollution, effective waste management, conservation of forest and sustainable development and living.
	The graduates should be able to demonstrate the capability to participate in community-engaged services/ activities for promoting the well-being of society.

Programme Learning outcomes: An Undergraduate Certificate (Civil Engineering) is awarded to students who have demonstrated the achievement of the outcomes located at level 4.5:

Element of the Descriptor	Programme learning outcomes relating to Undergraduate Certificate
The graduates should be able to demonstrate the acquisition of:	
Knowledge and understanding	knowledge of facts, concepts, principles, theories, and processes in basic sciences, multidisciplinary learning contexts within engineering
	understanding of the linkages between the fundamentals of engineering and its application
	procedural knowledge required for performing skilled or paraprofessional tasks associated with the electrical, mechanical, and computing fields.
General, technical and professional skills required to perform and accomplish tasks	a range of cognitive and technical skills related to manufacturing practices, computing, economics, sciences, communication skills for accomplishing assigned tasks in civil engineering
Application of knowledge and skills	The graduates should be able to demonstrate the ability to apply the acquired operational or technical and theoretical knowledge, and a range of cognitive and practical skills to select and use basic methods, tools, materials, and information to generate solutions to specific problems
Generic learning outcomes	The graduates should be able to demonstrate the ability of effective communication, critical thinking, self-directed and self-managed learning, gather and interpret relevant quantitative and qualitative data, critically evaluate principles and theories associated with the basic sciences and engineering, make judgment and take decisions, based on analysis of data and evidence, for formulating responses to issues/problems.
Constitutional, humanistic, ethical, and moral values	The graduates should be able to demonstrate the willingness to practice constitutional, humanistic, ethical, and moral values in one's life, and practice these values in real-life situations
Employability and job-ready skills, and entrepreneurship skills and capabilities/qualities and mindset	ability to exercise responsibility for the completion of assigned tasks and for the outputs of own work, and to take some responsibility for group work and output as a member of the group.
Credit requirements	The successful completion of the first year (two semesters) of the undergraduate programme of 48 credit hours

	followed by an exit 4-credit 8-weeks internship/industrial training.
Entry requirements	Passed 1O+2 (physics, Chemistry, Mathematics) with at least 45% in the aggregate.

Program Structure

SEMESTER: 1st									
Course Code	Course Title	Type of Courses	L	T	P	No. of Credits	Int.	Ext.	Total Marks
BCE1100	Engineering Mathematics-I	Major Core Course	3	1	0	4	30	70	100
BCE1101	Engineering Chemistry	Major Core Course	3	0	0	3	30	70	100
BCE1102	Introduction to Civil Engineering	Minor Course	4	0	0	4	30	70	100
BCE1103	Communication Skills - I	Ability Enhancement Course	2	0	0	2	30	70	100
BCE1104	Manufacturing Practices	Skill Enhancement Course	0	0	6	3	30	70	100
BCE1105	Engineering Chemistry Lab	Major Core Course	0	0	2	1	30	70	100
BCE1106	Principles of Economics	Multidisciplinary Course	3	0	0	3	30	70	100
VAC0001	Environment Education	Value Added Course	2	0	0	2	30	70	100
BCE1107	Entrepreneurship Setup & Launch	Entrepreneurship & Skill Enhancement	0	0	4	2	30	70	100
Total			17	1	12	24	270	630	900

SEMESTER: 2nd									
Course Code	Course Title	Type of Courses	L	T	P	No. of Credits	Int.	Ext.	Total Marks
BCE2150	Engineering Mathematics–II	Major Core Course	3	1	0	4	30	70	100
BCE2151	Engineering Physics	Major Core Course	3	0	0	3	30	70	100
BCE2152	Introduction to Concrete Technology	Minor Course	4	0	0	4	30	70	100
BCE2153	Engineering Graphics & Drawing	Discipline Skill Enhancement Course	4	0	0	4	30	70	100
BCE2154	Computer Proficiency	Skill Enhancement Course	2	0	0	2	30	70	100
BCE2155	Communication Skills - II	Ability Enhancement Course	2	0	0	2	30	70	100
BCE2156	Engineering Physics Lab	Major Core Course	0	0	2	1	30	70	100
BCE2157	Computer Proficiency Lab	Skill Enhancement Course	0	0	2	1	30	70	100
BCE2158	Indian Constitution	Multidisciplinary Course	3	0	0	3	30	70	100
VAC0002	Human Values and Professional Ethics	Value Added Course	2	0	0	2	30	70	100
BCE2159	Entrepreneurship marketing basics	Entrepreneurship & Skill Enhancement	0	0	4	2	30	70	100
Total			23	1	8	28	330	770	1100

Criteria for Multiple Exit After 2nd Semester:

A **8-weeks** internship/industrial training at a recognized organization. This training must be related the Civil Engineering field. A student needs to obtain the permission from the University before applying for an internship/industrial training. The student will also submit the approval letter from the concerned official from the organization. This official will act as the off-campus faculty member, who will evaluate the student's performance during the internship/industrial training. **Undergraduate Certificate (Civil Engineering)** will be given to the students on submitting the completion certificate from the organization.

Programme learning outcomes: An Undergraduate Diploma (Civil Engineering) is awarded to students who have demonstrated the achievement of the outcomes located at level 5:

Element of the Descriptor	Programme learning outcomes relating to Undergraduate Diploma
The graduates should be able to demonstrate the acquisition of:	
Knowledge and understanding	knowledge of facts, concepts, principles, theories, and processes in mechanics, materials, and planning.
	procedural knowledge required for preparing the civil engineering drawing
	knowledge of ancient Indian science for understanding the fundamentals modern engineering
Skills required to perform and accomplish tasks	a range of cognitive and technical skills required in the field of Transportation, soil, survey, and construction materials
	cognitive skills required to identify, analyze and synthesize the results of experimentation
	cognitive and technical skills required for civil engineering survey for highway and building construction
Application of knowledge and skills	The graduates should be able to demonstrate the ability to apply the acquired knowledge in materials testing & characterization, structural analysis, and field investigation in construction practices
Generic learning outcomes	• The graduates should be able to demonstrate the ability to express thoughts and ideas effectively in writing and orally and present the results/findings of the experiments carried out in a clear and concise manner to different groups. • The graduates should be able to demonstrate the ability to make judgment and take decisions, based on analysis of experimental data
Constitutional, humanistic, ethical, and moral values	The graduates should be able to demonstrate the willingness to put forward convincing arguments to respond to the ethical and moral issues associated with the construction section.
Employability and job-ready skills, and entrepreneurship skills and capabilities/qualities and mindset	knowledge and a basket of soil analysis for foundation, concrete mix design, highway geometric design, analysis of structural performance required to perform the construction activities effectively
Credit requirements	The successful completion of the first two years (four semesters) of the B.Tech (Civil Engineering) involving 98

	credit hours followed by an exit 4-credit internship/industrial training.
Entry requirements	• UG Certificate (Civil Engineering) • Continuation of study or lateral entry in the second year of the undergraduate programme will be possible for those who have met the entrance requirements, including specified levels of attainment, specified in the programme regulations. The continuation of the study will be based on the evaluation of documentary evidence (including the academic record and/or evidence relating to the assessment and certification of prior learning) of the applicant's ability to pursue an undergraduate programme of study. Lateral entry into the programme of study at NHEQF level 5 will be based on the validation of prior learning outcomes achieved, including those achieved outside of formal learning or through learning and training in the workplace or in the community, through continuing professional development activities, or through independent/self-directed learning activities.

SEMESTER: 3rd									
Course Code	Course Title	Type of Courses	L	T	P	No. of Cr.	Int.	Ext.	Total Marks
BCE3200	Concrete Technology	Major Core Course	3	0	0	3	30	70	100
BCE3201	Solid Mechanics	Major Core Course	3	0	0	3	30	70	100
BCE3202	Fluid Mechanics	Minor Course	3	0	0	3	30	70	100
BCE3203	Building Materials & Construction	Discipline Skill Enhancement Course	4	0	0	4	30	70	100
BCE3205	Concrete Technology Lab	Major Core Course	0	0	2	1	30	70	100
BCE3206	Solid Mechanics Lab	Major Core Course	0	0	2	1	30	70	100
BCE3207	Fluid Mechanics Lab	Minor Course	0	0	2	1	30	70	100
BCE3208	Professional Communication	Ability Enhancement Course	2	0	0	2	30	70	100
BCE3209	Sustainable Development	Multidisciplinary Course	3	0	0	3	30	70	100
IKS0001	Bharatavarsha— A Land of Rare Natural Endowments	Value Added Course	2	0	0	2	30	70	100
BCE3212	Operations and Scale	Entrepreneurship & Skill Enhancement	0	0	4	2	30	70	100
Skill Enhancement Course (Any one of the following)									
BCE3204	Building Planning and Computer- aided Civil Engineering drawing	Skill Enhancement Course	3	0	0	3	30	70	100
BCE3210	Disaster Risk Reduction & management : Skills for safety & resilience	Skill Enhancement Course	2	0	2				
BCE3211	Basics of Cyber Security	Skill Enhancement Course	3	0	0				

Total	23	0	10	28	360	840	1200
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SEMESTER: 4 th									
Course Code	Course Title	Type of Courses	L	T	P	No. of Credits	Int.	Ext.	Total Marks
BCE4250	Structural Analysis I	Major core course	3	1	0	4	30	70	100
BCE4251	Transportation Engineering	Major Core Course	3	0	0	3	30	70	100
BCE4252	Geotechnical Engineering	Major Core Course	3	0	0	3	30	70	100
BCE4253	Surveying and Geomatics	Vocational Course	3	0	0	3	30	70	100
BCE4254	Transportation Engineering Lab	Major core course	0	0	2	1	30	70	100
BCE4255	Geotechnical Engineering Lab	Major core course	0	0	2	1	30	70	100
BCE4256	Surveying and Geomatics Lab	Vocational Course	0	0	2	1	30	70	100
BCE4257	Report Writing	Ability Enhancement Course	0	0	4	2	30	70	100
IKS0008	Indian Architecture and Town Planning	Value Added Course	2	0	0	2	30	70	100
BCE4261	Organic Growth	Entrepreneurship & Skill Enhancement	0	0	4	2	30	70	100
Discipline Specific Elective (DSE) Course 1 (Any one of the following)									
BCE4259	Construction Engineering & Management	Discipline Specific Elective	3	1	0	4	30	70	100
BCE4260	Materials, Testing & Evaluation								
Total			17	2	14	26	330	770	1100

Programme learning outcomes: The Bachelor of Vocational (Civil Engineering) is awarded to students who have demonstrated the achievement of the outcomes located at level 5.5:

Element of the Descriptor	Programme learning outcomes relating to Bachelor of Vocational (Civil Engineering)
The graduates should be able to demonstrate the acquisition of:	
Knowledge and understanding	The graduates should be able to demonstrate the acquisition of underlying principles and theories relating to multidisciplinary fields of estimation, structural analysis, water supply, hydrology, advanced surveying techniques, transportation, construction equipments.
	knowledge of the current and emerging issues and developments in advanced analysis, water quality analysis, engineering surveys, and hydraulics.
General, technical and professional skills required to perform and accomplish tasks	cognitive and technical skills required for performing and accomplishing complex tasks relating to Civil Engineering.
	cognitive and technical skills required to evaluate and analyze complex issues in water supply and sanitation, Reinforced concrete structures, sustainable construction methods, use of construction equipments, and traffic issues.
Application of knowledge and skills	The graduates should be able to demonstrate the ability to apply the acquired specialized technical or theoretical knowledge, and cognitive and practical skills to gather and analyze quantitative/ qualitative data to assess the appropriateness of different approaches to solving problems. To employ the right approach to generate solutions to problems related to the chosen fields of learning.
Generic learning outcomes	The graduates should be able to demonstrate the ability to: • make coherent arguments to support the findings/results of the study undertaken to field engineers and government agencies • Pursue self-paced and self-directed learning to upgrade knowledge and skills on advance level of courses in civil engineering • critically evaluate evidence for taking actions to generate solutions to real life problems
Constitutional, humanistic, ethical, and moral values	The graduates should be able to demonstrate the willingness and ability to formulate coherent arguments about environmental and sustainable development issues, from different civil engineering structures' perspectives.
Employability and job-ready	knowledge and essential skills set and competence that are necessary to take up a professional job in the field of

skills, and entrepreneurship skills and capabilities/qualities and mindset	structural design, construction equipments, water supply and treatment, cost estimation, advanced engineering survey, traffic engineering, and material testing.
Credit requirements	The successful completion of the first three years (six semesters) of the B.Tech (Civil Engineering) involving 140 credit hours.
Entry requirements	• Under Graduate Diploma (Civil Engineering) • Continuation of study or lateral entry into the third year of the B.Tech will be possible for those who have met the specified levels of attainment, specified in the programme admission regulations. The continuation of the study will be based on the evaluation of documentary evidence (including the academic record and/or evidence relating to the assessment and certification of prior learning) of the applicant's ability to pursue and complete the undergraduate programme of study. Lateral entry into the programme of study at NHEQF level 5.5 will be based on the validation of prior learning outcomes, including those achieved outside of formal learning or through learning and training in the workplace or in the community, through continuing professional development activities, or through independent/self-directed learning activities.

SEMESTER: 5 th									
Cours e Code	Course Title	Type of Courses	L	T	P	No. of Credi ts	Int.	Ext.	Total Marks
BCE5 300	Structural Analysis II	Major core course	3	1	0	4	30	70	100
BCE5 301	Environmental Engineering	Major core course	3	0	0	3	30	70	100
BCE5 302	Engineering Economics, Estimation & Costing	Vocational Course	3	0	0	3	30	70	100
BCE5 303	Environmental Engineering Lab	Major core course	0	0	2	1	30	70	100
BCE5 304	Engineering Economics, Estimation & Costing Lab	Vocational Course	0	0	2	1	30	70	100
BCE5 305	Survey Camp	Skill	0	0	0	2	30	70	100
BCE5 312	AI Automation & Finance	Entrepreneur ship & Skill Enhancemen t	0	0	4	2	30	70	100
Discipline Specific Elective (DSE) Course 2 (Any one of the following)									
BCE5 306	Hydrology & Water Resources Engineering	Discipline Specific Elective Course	3	1	0	4	30	70	100
BCE5 307	Traffic Engineering and Management								
Discipline Specific Elective (DSE) Course 3 (Any one of the following Along with same practical course)									
BCE5 308	Total station and GPS surveying	Discipline Specific Elective Course	3	0	0	3	30	70	100
BCE5 309	Plumbing (Water and Sanitation)								
BCE5 310	Total station and GPS surveying Lab	Discipline Specific	0	0	2	1	30	70	100

BCE5311	Plumbing (Water and Sanitation) Lab	Elective Course							
Total			15	2	10	24	300	700	1000
*The Survey Camp will be organized at a hilly terrain. It will be organized after the final Examinations of 4 th semester and will be evaluated in the 5 th semester. The total Expenditure will be paid by the students themselves.									

SEMESTER: 6 th									
Course Code	Course Title	Type of Courses	L	T	P	No. of Credits	Int.	Ext.	Total Marks
BCE6350	Design of Concrete Structures	Major core course	3	0	0	3	30	70	100
BCE6351	Hydraulic Engineering	Major core course	3	0	0	3	30	70	100
BCE6352	Sustainable and Green construction	Vocational Course	3	1	0	4	30	70	100
BCE6353	Design of Concrete Structures Lab	Major core course	0	0	2	1	30	70	100
BCE6354	Hydraulic Engineering Lab	Major core course	0	0	2	1	30	70	100
Discipline Specific Elective (DSE) Course 4 (Any one of the following)									
BCE6355	Railway Engineering	Discipline Specific Elective Course	3	1	0	4	30	70	100
BCE6356	Advanced Concrete Technology								
Discipline Specific Elective (DSE) Course 5 (Any one of the following)									
BCE6357	Intelligent Transportation Systems	Discipline Specific Elective Course	3	1	0	4	30	70	100
BCE6358	Construction Equipment & Automation								
Total			15	3	4	20	210	490	700

Programme learning outcomes: The Bachelor of Technology (Civil Engineering) is awarded to students who have demonstrated the achievement of the outcomes located at level 6:

Element of the Descriptor	Programme learning outcomes relating to Bachelor of Technology (Civil Engineering)
The graduates should be able to demonstrate the acquisition of:	
Knowledge and understanding	advanced knowledge about various fields of civil engineering
	a coherent understanding of the established methods and techniques of design of foundation, cost estimation, water resources and irrigation, design of concrete and steel structures, highway management.
	industry ready skills and practical knowledge
General, technical and professional skills required to perform and accomplish tasks	Generate solutions to complex problems independently, requiring the exercise of full personal judgement, responsibility, and accountability for the output of the initiatives taken as a practicing civil engineer.
	cognitive and technical skills required to solve modern construction issues
Application of knowledge and skills	The graduates should be able to demonstrate the ability to apply the acquired specialized technical or theoretical knowledge, and cognitive and practical skills to gather and analyze quantitative/ qualitative data to assess the appropriateness of different approaches to solving problems. To employ the right approach to generate solutions to problems related to the chosen fields of learning.
Generic learning outcomes	The graduates should be able to demonstrate the ability to: • make coherent arguments to support the findings/results of the study undertaken to field engineers and government agencies • Pursue self-paced and self-directed learning to upgrade knowledge and skills on advance level of courses in civil engineering critically evaluate evidence for taking actions to generate solutions to real life problems
Constitutional, humanistic, ethical, and moral values	The graduates should be able to demonstrate the willingness and ability to formulate coherent arguments about environmental and sustainable development issues, from different civil engineering structures' perspectives.
Employability and job-ready skills, and entrepreneurship skills and	knowledge and essential skills set and competence that are necessary to take up a professional job in the field of structural design, construction equipments, water supply and treatment, cost estimation, advanced engineering survey, traffic engineering, and material testing.

capabilities/qualities and mindset	
Credit requirements	The successful completion of the 4- years (eight semesters) of the B.Tech (Civil Engineering) involving 160 credit hours.
Entry requirements	• B.Voc (Civil Engineering) Continuation of undergraduate programme leading to the bachelor's degree (Honours/ Honours with Research) will be open to those who have met the entrance requirements, including specified levels of attainment, in the programme admission regulations. Continuation of the programme of study will be based on the evaluation of documentary evidence (including the academic record and/or evidence relating to the assessment and certification of prior learning) of the applicant's ability to pursue study during the fourth year (semesters 7 & 8) of the 4-year Bachelor's degree (Honours/ Honours with Research) programme. Lateral entry into the programme of study at NHEQF level 6 will be based on the validation of prior learning outcomes, including those achieved outside of formal learning or through learning and training in the workplace, through continuing professional development activities, or through independent/self-directed/self-managed learning activities.

SEMESTER: 7th									
Course Code	Course Title	Type of Courses	L	T	P	No. of Credits	Int.	Ext.	Total Marks
BCE7400	Design of Steel Structures	Major core course	3	1	0	4	30	70	100
BCE7401	Project	Minor Course	0	0	8	4	30	70	100
Discipline Specific Elective (DSE) Course 6 (Anyone of the Following)									
BCE7402	Foundation Engineering	Discipline Specific Elective Course	3	1	0	4	30	70	100
BCE7403	Ground Improvement Techniques								
Discipline Specific Elective (DSE) Course 7 (Anyone of the Following)									
BCE7404	Contracts Management	Discipline Specific Elective Course	3	1	0	4	30	70	100
BCE7405	Advanced Structural Design								
Discipline Specific Elective (DSE) Course 8 (Anyone of the Following)									
BCE7406	Airport Planning and Design	Discipline Specific Elective Course	3	1	0	4	30	70	100
BCE7407	Construction Cost Analysis								
Total			12	4	8	20	150	350	500

SEMESTER: 8th									
Course Code	Course Title	Type of Courses	L	T	P	No. of Credits	Int.	Ext.	Total Marks
BCE8450	Internship	Skill	0	0	0	20	30	70	100
Total			0	0	0	20	30	70	100

Total Credits and Marks

Semester	L	T	P	Total Credits	Total Marks	Qualification
I	17	1	12	24	900	Undergraduate Certificate (Civil Engineering)
II	23	1	8	28	1100	
III	23	0	10	28	1200	Undergraduate Diploma (Civil Engineering)
IV	17	2	14	26	1100	
V	15	2	10	24	1000	Bachelor of Vocational (Civil Engineering)
VI	15	3	4	20	700	
VII	12	4	8	20	500	Bachelor of Technology (Civil Engineering)
VIII	0	0	0	20	100	
Total				190	6600	