

Dated: 11<sup>th</sup> April, 2012

To,

**Sub: Response to Civil Engineering diploma programme questionnaire.**

Dear friend,

Gujarat Technological University is re-designing the curricula of its diploma engineering programmes to match with the needs of the industries. For this purpose, we have collaborated with National Institute of Technical Teachers' Training and Research Bhopal (NITTTR Bhopal) who have the expertise in developing the curricula for technical educational programmes at national level.

It has been decided by NITTTR Bhopal and GTU to design the curricula on the outcome/competency-based approach so that pass outs are not only theoretically knowledgeable, but are also able to perform well in the industry at the time of joining the industry from the polytechnic system. Once this curriculum is developed it would guide efforts of teachers and students to achieve the identified competencies.

For development of such a scientific curriculum, identification of the competencies to meet the requirements of the industry is the first step.

For the project, this questionnaire is jointly developed by GTU and NITTTR, which is designed to identify the entry-level competencies expected of **Civil engineering** diploma holders required to perform their jobs independently in an industry to avoid the present long-term training given to freshly recruited engineering diploma holders.

We would be thankful if the person, who is actually taking work from the **Civil Engineering** Diploma pass outs, responds to this questionnaire. Your response is voluntary and would be used only for academic purposes and would not be shared with any other agency. Only the collated responses of all the industries would be used for decision making.

Thank you very much for your valuable responses.

Yours sincerely,

Dr. Akshai Aggarwal

**Curriculum Development Project**  
**Identification of Competencies Required of**  
**CIVIL Engineering Diploma Holders**

**Terms of Reference for this Project**

‘**Competency**’ is what you expect a fresh engineering diploma holder to do at the entry level, i.e. *‘a statement which describes the integrated demonstration of a cluster of related skills and attitudes that are observable and measurable necessary to perform a **job** independently at the workplace, at a prescribed proficiency level’.*

While a ‘**job**’ is that which you will call upon your engineering diploma holder to do i.e. *‘a complete activity having a definite beginning point and an ending point, which can be performed over a short period of time independent of other works resulting in a product, service or decision’.*

The ‘**prescribed proficiency level**’ is the ‘*threshold level*’ at the end of three years of study at the polytechnic.

With these *terms of reference* in the background, your opinion of the competencies concerning a **fresh** engineering diploma passouts are listed here. Against each, you are required to **state your opinion** by ticking (✓) in the most appropriate box in the enclosed **one sheet** questionnaire.

Name of the Industry.....  
 Main Product.....  
 Address of the industry .....  
 .....  
 .....

**Approximate number of engineering diploma holders employed in your industry:**

- a) Electrical Engineering Diploma Holders .....Nos.
- b) Mechanical Engineering Diploma Holders .....Nos.
- c) Electronics Engineering Diploma Holders .....Nos.
- d) Instrumentation Engineering Diploma Holders .....Nos.
- e) Civil Engineering Diploma Holders .....**Nos.**
- f) Chemical Engineering Diploma Holders .....Nos.
- g) Computer/IT Engineering Diploma Holders .....Nos.
- h) Automobile Engineering Diploma Holders .....Nos.

**Table – 1**

Preferably this questionnaire needs to be filled up by **those who take work from civil engineering diploma holders**

	<b>TECHNICAL COMPETENCIES OF DIPLOMA HOLDERS</b> <ul style="list-style-type: none"> <li>▪ <b>Essential</b> means it is core competency and used frequently</li> <li>▪ <b>Not applicable</b> means not required in your industry at all.</li> </ul>	<i>Essential</i>	<i>Desirable</i>	<i>Rarely used</i>	<i>Not applicable</i>
T1	Develop awareness regarding Environment to ensure better Quality of Life.				
T2	Follow safety precautions During Natural Disaster like Earthquake, Flood, Chemical decay of materials etc.				
T3	Apply Principles of Physics to solve Engineering Problems.				
T4	Perform Tests applicable for Applied Mechanics.				
T5	Analyze the Statically Indeterminate Structures using various Principles of Mechanics				
T6	Analyze the Statically Determinate Structures using various Principles of Mechanics				
T7	Develop working Drawings of Building. Read and Interpret Local Building Bye Laws				
T8	Develop 2D and 3D Civil Engineering Drawings through AutoCAD and other softwares.				
T9	Interpret various Civil Engineering Drawings for execution of Construction				
T10	Prepare survey maps for given area using appropriate surveying instruments				
T11	Calibrate Survey Instruments like Compass , Dumpy Level and Theodolite.				
T12	Use TOTAL STATION for Civil Survey				
T13	Conduct tests for Various Building Materials like Bricks , Stone , Steel , wood etc...				

	<b>TECHNICAL COMPETENCIES OF DIPLOMA HOLDERS</b> <ul style="list-style-type: none"> <li>▪ <i>Essential</i> means it is core competency and used frequently</li> <li>▪ <i>Not applicable</i> means not required in your industry at all.</li> </ul>	<i>Essential</i>	<i>Desirable</i>	<i>Rarely used</i>	<i>Not applicable</i>
T14	Conduct tests for physical Properties of Cement.				
T15	Evaluate the quality of various Building Materials.				
T16	Use various Building Materials for constructing safe and economical structures including Market Survey				
T17	Execute Construction procedure of various civil Engineering Structures in accordance to the given drawing and specifications.				
T18	Maintain Hygienic Environment at Construction Sites.				
T19	Dispose off hazardous Waste Materials and Debris at Construction site properly.				
T20	Compute properties of flowing water through Pipes and Open Channel to supply required quantity of water.				
T21	Maintain various irrigation structures like Canals, Dams, Culverts, Notches and Weirs				
T22	Compute water requirements of various crops.				
T23	Ensure required Water Supply at the Farm Outlet.				
T24	Supervise construction and maintenance of Roads , Buildings and Bridges				
T25	Perform tests for physical Properties of Bitumen and Highway Materials				
T26	Supervise construction and maintenance of Railway Tracks				
T27	Work out the Quantity of various Items of Civil Engineering Structures				
T28	Compute Estimated Cost of Civil Engineering Structures as per Drawings				
T29	Evaluate the Market Price of existing Residential Building				
T30	Use and apply AutoCAD , STAAD Softwares for Estimate and Costing				
T31	Plan the Construction Schedule , Control and Manage the works				
T32	Ensure safe Installation of Scaffoldings.				
T33	Remove Scaffoldings properly.				
T34	Ensure safety during Construction				
T35	Manage Materials, Labor and Equipments for optimum use.				
T36	Ensure Quality as per NBC of Construction Materials and Construction Process.				
T37	Carry out inspection and use Statistical Tools to ensure Quality Control.				
T38	Develop Water supply system for community.				

	<b>TECHNICAL COMPETENCIES OF DIPLOMA HOLDERS</b> <ul style="list-style-type: none"> <li>▪ <i>Essential</i> means it is core competency and used frequently</li> <li>▪ <i>Not applicable</i> means not required in your industry at all.</li> </ul>	<i>Essential</i>	<i>Desirable</i>	<i>Rarely used</i>	<i>Not applicable</i>
T39	Supervise plumbing and sanitation system for residential and commercial Buildings.				
T40	Perform Tests of Raw Water.				
T41	Perform Tests of Waste Water.				
T42	Develop Waste water disposal system.				
T43	Perform Test for Foundation Soil of construction Project as per IS provisions				
T44	Design RCC structural elements using IS 456-2001				
T45	Interpret and Draw RCC Structural Drawing using IS 456-2001 , IS 13920 and SP -34				
T46	Design Simple Steel structural elements using IS 800-2007				
T47	Interpret and Draw Steel Structural Drawings				
T48	Design Concrete Mix for the Civil Engineering Structures.				
T49	Conduct test of Concrete , Coarse and Fine Aggregate				
T50	Develop awareness for storage and optimal use of ground and rain water resource.				
T51	Create Awareness regarding using and operating Advanced Plants and equipment for mega structures				
T52	Perform Non Destructive Test for Concrete				
T53	Resolve disputes/conflicts at site				
T54	Ensure Labor welfare				
T55	Apply Cost Effective measures				
T56	Use Project Management Software				
T57	Apply the Principles for starting of enterprise				
T58	Read and Interpret SOR for current market price				
T59	Use the Application of Machines/Equipment such as Mixer, Vibrator , Crain , Truck Mixer , Pumps , Batch Plant etc.				
T60	Understand the meaning of Terms/Terminology Used in Civil Engineering				
T61	Select Appropriate Code of Practice Used in Civil Engineering				
T62	Install and Commissioning of Precast Structural Elements				
T63	Appreciate the Civil Engineering Site Requirements				
	<b>Any other additional Technical Competencies</b>				
T64					
T65					
T66					
T67					
T68					

**Table – 2**

Some generic *competencies* required by a diploma holder from any branch of engineering are also listed below. Kindly rate them by placing a tick in the appropriate column.

	<b>GENERIC COMPETENCIES</b> <ul style="list-style-type: none"> <li>▪ <i>Essential</i> means it is core competency and used frequently</li> <li>▪ <i>Not applicable</i> means not required in your industry at all.</li> </ul>	<i>Essential</i>	<i>Desirably used</i>	<i>Rarely used</i>	<i>Not applicable</i>
<b>G1</b>	Communicate effectively in English in oral and written form with superiors, subordinates and peers				
G2	Manage people at work				
G3	Work as a group leader & as a team member to achieve goals				
G4	maintain inventory filing system, indexing system of drawings/documents and technical reference libraries				
G5	Lead group discussions and meetings independently				
G6	Use all resources like media, market survey, technical literature etc. to gather information for taking decisions				
G7	Prepare detailed project proposals and reports for identified products/services.				
G8	Prepare tender documents & comparative statements				
	<i>Any other (Please specify)</i>				
G9					
G10					
G11					
G12					
G13					

**State the job functions of engineering diploma holders in the initial five years after joining your organization from the polytechnic**

- |         |          |
|---------|----------|
| 1. .... | 7. ....  |
| 2. .... | 8. ....  |
| 3. .... | 9. ....  |
| 4. .... | 10. .... |
| 5. .... | 11. .... |
| 6. .... | 12. .... |

**Table - 3**

List the major electrical engineering equipment used in your industry

S. No.	Name of the equipment/Instrument	Broad type/rating/specifications
1		
2		
3		
4		
5		
6		
7		

**Table - 4**

State the career growth opportunity for an average engineering diploma holder

Designation	<i>Example:</i> Junior Engineer (or Technician)					
Years of Experience required to reach the position	at Entry Level	After 3 years	After 6 years	After 10 years	After 15 years	After 20 years

Do you think that industrial training must be provided to the students as an integral part of the curriculum? Yes / No.

a) If yes, for how many months? One/ Two/ Three/ Six Months.....

b) If yes, in which semester/s the industrial practical training need to be included?

Signature:.....

Name & Designation of person responding:.....

Phone:

Mobile

Email:

Thank you very much for your valuable responses.

Dr. Akshai Aggarwal  
Vice Chancellor  
Gujarat Technological University