

Dated: 11th April, 2012

To,

Sub: Response to Electrical 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, NITTTR and GCCI, which is designed to identify the entry-level competencies expected of **Electrical 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 **Electrical 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
Electrical 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 HoldersNos.
- b) Mechanical Engineering Diploma HoldersNos.
- c) Electronics Engineering Diploma HoldersNos.
- d) Instrumentation Engineering Diploma HoldersNos.
- e) Civil Engineering Diploma HoldersNos.
- f) Chemical Engineering Diploma HoldersNos.
- g) Computer/IT Engineering Diploma HoldersNos.
- h) Automobile Engineering Diploma HoldersNos.

Table – 1

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

	TECHNICAL COMPETENCIES <ul style="list-style-type: none"> ▪ <i>Essential</i> means it is core competency and used frequently ▪ <i>Not applicable</i> means not required in your industry at all. 	<i>Essential</i>	<i>Desirable</i>	<i>Rarely used</i>	<i>Not applicable</i>
T1	Maintain 1-phase & 3-phase induction motors				
T2	Maintain different types of AC generators				
T3	Maintain different types of DC motors and generators				
T4	Maintain different types of 1-phase and 3-phase transformers				
T5	Troubleshoot of motorized and non-motorized domestic appliances				
T6	Troubleshooting of various electrical machines				
T7	Maintain Microprocessor-based/SCR controlled electric drives				
T8	Maintain the performance of sub-stations				
T9	Use different types of test and measuring instruments used to measure various electrical/electronic parameters				
T10	Maintain thyristor control devices such as power transistors, GTOs, IGBTs etc.				
T11	Troubleshoot LT and HT switchgear panels and associated cables and overhead lines				
T12	Implement the schedule for preventive maintenance as per I.S. for electrical equipment using appropriate hand tools				
T13	Maintain Storage Battery				
T14	Maintain LT distribution systems of overhead lines and underground cables				
T15	Calibrate various types of electrical equipment as per standards				
T16	Interpret circuit diagrams and specifications of electrical systems given in technical/service manuals				

	TECHNICAL COMPETENCIES <ul style="list-style-type: none"> ▪ <i>Essential</i> means it is core competency and used frequently ▪ <i>Not applicable</i> means not required in your industry at all. 	<i>Essential</i>	<i>Desirable</i>	<i>Rarely used</i>	<i>Not applicable</i>
T17	Maintain different analog and digital electronic circuits associated with electrical installation and instruments				
T18	Estimate the quantity and cost of electrical work/installations				
T19	Design simple circuits for testing HT and LT control panels				
T20	Maintain multistoried electric systems and electric lifts				
T21	Use Heating Welding Processes using Power Electronic Devices				
T22	Test, maintain & audit domestic and industrial wiring as per IS.				
T23	Use different measuring, indicating and recording electrical and electronic instruments and its error analysis				
T24	Maintain Electric Power transmission lines				
T25	Maintain Electric generating stations and sub-stations				
T26	Maintain Electric Traction Systems				
	Any other additional competencies				
1	Use softwares like EWB, MULTI SIM, MATLAB etc. for simple applications				
2	Maintain large wind turbines				
3	Maintain small wind turbines				
4	Maintain solar photo voltaic (PV) systems and storage batteries				
5	Maintain solar heating systems				
6	Maintain ocean energy systems				
7	Use PLCs, SCADA and Micro-Controllers for various applications				
8					
9					
10					
11					
12					
13					

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.

	GENERIC COMPETENCIES <ul style="list-style-type: none"> ▪ <i>Essential</i> means it is core competency and used frequently ▪ <i>Not applicable</i> means not required in your industry at all. 	<i>Essential</i>	<i>Desirable</i>	<i>Rarely used</i>	<i>Not applicable</i>
G1	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				

GENERIC COMPETENCIES		<i>Essential</i>	<i>Desirable</i>	<i>Rarely used</i>	<i>Not applicable</i>
	<ul style="list-style-type: none"> ▪ <i>Essential</i> means it is core competency and used frequently ▪ <i>Not applicable</i> means not required in your industry at all. 				
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				
G9	Perform Electroplating / coating as per specifications				
G10	Use insulators for various applications				
G11	Disposal of hazardous materials properly				
	<i>Any other (Please specify)</i>				
G12	Select appropriate advanced materials for specific applications in engineering				
G13	Follow safety practices & pollution control measures				
G14	Develop mathematical & reasoning ability				
G15					
G16					
G17					
G18					
G19					

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		

S. No.	Name of the equipment/Instrument	Broad type/rating/specifications

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