Appendix S

Graduate Survey

Table 1 Graduate Survey of Electrical Engineering and Automation

Training objective	Goodness of fit														
	2013					2014					2015				
	Excellent	Good	Medium	Pass	Fail	Excellent	Good	Medium	Pass	Fail	Excellent	Good	Medium	Pass	Fail
Training objective 1	37 69.81%	12 22.64%	2 3.77%	1 1.89%	1 1.89%	4 57.14%	2 28.57%	0 0.00%	1 14.29%	0 0.00%	9 60.00%	3 20.00%	1 6.67%	1 6.67%	1 6.67%
Training objective 2	36 67.92%	12 22.64%	4 7.55%	0 0.00%	1 1.89%	4 57.14%	2 28.57%	0 0.00%	1 14.29%	0 0.00%	9 60.00%	4 26.67%	0 0.00%	1 6.67%	1 6.67%
Training objective 3	35 66.04%	13 24.53%	3 5.66%	1 1.89%	1 1.89%	3 42.86%	3 42.86%	0 0.00%	1 14.29%	0 0.00%	8 53.33%	3 20.00%	1 6.67%	2 13.33%	1 6.67%
Training objective 4	38 71.07%	10 18.87%	1 1.89%	2 3.77%	1 1.89%	4 57.14%	2 28.57%	0 0.00%	1 14.29%	0 0.00%	10 66.67%	3 20.00%	0 0.00%	1 6.67%	1 6.67%
Training objective 5	37 69.81%	12 22.64%	2 3.77%	1 1.89%	1 1.89%	4 57.14%	2 28.57%	0 0.00%	0 0.00%	1 14.29%	8 53.33%	4 26.67%	1 6.67%	0 0.00%	2 13.33%
Training objective 6	33 62.26%	10 18.87%	5 9.43%	4 7.55%	1 1.89%	3 42.86%	2 28.57%	0 0.00%	1 14.29%	1 14.29%	8 53.33%	3 20.00%	2 13.33%	0 0.00%	2 13.33%
Training objective 7	37 69.81%	12 22.64%	3 5.66%	1 1.89%	0 0.00%	5 71.43%	3 42.86%	0 0.00%	0 0.00%	0 0.00%	12 80.00%	2 13.33%	0 0.00%	0 0.00%	1 6.67%
Training objective 8	39 73.58%	13 24.53%	1 1.89%	0 0.00%	0 0.00%	5 71.43%	2 28.57%	0 0.00%	0 0.00%	0 0.00%	11 73.33%	3 20.00%	0 0.00%	0 0.00%	1 6.67%
Training objective	2016					2017					2018				
	Excellent	Good	Medium	Pass	Fail	Excellent	Good	Medium	Pass	Fail	Excellent	good	Meduim	Pass	Fail
Training objective 1	43 57.33%	22 29.33%	5 6.67%	3 4.00%	2 2.67%	19 61.29%	9 29.03%	3 9.68%	0 0.00%	0 0.00%	38 45.78%	34 40.96%	8 9.64%	1 1.20%	2 2.41%
Training objective 2	41 54.67%	23 30.67%	5 6.67%	4 5.33%	2 2.67%	16 51.61%	12 38.71%	3 9.68%	0 0.00%	0 0.00%	45 54.22%	29 34.94%	4 4.82%	2 2.41%	3 3.61%
Training objective 3	36 48.00%	27 36.00%	6 8.00%	4 5.33%	2 2.67%)	17 54.84%	10 32.26%	3 9.68%	1 3.23%	0 0.00%	40 48.19%	23 27.71%	17 20.48%	1 1.20%	2 2.41%

Training objective 4	37 49.33%	26 34.67%	7 9.33%	3 4.00%	2 2.67%	16 51.61%	14 45.16%	1 3.23%	0 0.00%	0 0.00%	42 50.60%	31 37.35%	7 8.43%	1 1.20%	2 2.41%
Training objective 5	36 48.00%	24 32.00%	10 13.33%	3 4.00%	2 2.67%	16 51.61%	13 41.94%	2 6.45%	0 0.00%	0 0.00%	40 48.19%	33 39.76%	6 7.23%	2 2.41%	2 2.41%
Training objective 6	31 41.33%	25 33.33%	9 12.00%	7 9.33%	3 4.00%	15 48.39%	12 38.71%	3 9.68%	0 0.00%	1 3.23%	35 42.17%	27 32.53%	14 16.87%	5 6.02%	2 2.41%
Training objective 7	48 64.00%	18 24.00%	5 6.67%	3 4.00%	1 1.33%	18 58.06%	10 32.26%	3 9.68%	0 0.00%	0 0.00%	50 60.24%	23 27.71%	5 6.02%	4 4.82%	1 1.20%
Training objective 8	48 64.00%	18 24.00%	5 6.67%	3 4.00%	1 1.33%	21 67.74%	8 25.81%	2 6.45%	0 0.00%	0 0.00%	46 55.42%	25 30.12%	7 8.43%	3 3.61%	2 2.41%

Training Objective 1: Have the relevant mathematics, natural sciences, and economic and management knowledge required for electrical engineering work, understand general electrical engineering production processes and cutting-edge technologies.

Training Objective 2: Master the basic methods of literature search, data query and use of modern information technology to obtain relevant information, understand the basic knowledge of information technology, and effectively acquire and apply information.

Training Objective 3: Master the programming language and software related to electrical engineering, and combine computer applications with professional knowledge.

Training Objective 4: Master the basic knowledge of electrical engineering and basic theoretical knowledge of the profession, have the ability to acquire and apply professional knowledge, and have strong professional practice skills and professional ability.

Training Objective 5: Understand the operation of the power system, including power generation, transmission, distribution, and power applications, or have the ability to innovate design, development, improvement, installation, operation, commissioning, and maintenance of general industrial electrical equipment.

Training Objective 6: Have a certain English writing and expression ability, can better use English knowledge, read English literature in electrical engineering field with a dictionary, and write English abstracts of papers.

Training objective 7: Have certain artistic accomplishment and aesthetic ability, good sense of social responsibility, humanities and social science literacy and engineering professional ethics, good team spirit and effective communication, coordination and cooperation ability, certain organizational management ability.

Training objective 8: Have a correct understanding of lifelong learning and the ability to acquire knowledge, continuous learning and adapt to development.

Table 2 Graduate Survey of Communication Engineering

Training Objectives	Goodness of Fit														
	2013					2014					2015				
	Excellent	Good	Medium	Pass	Fail	Excellent	Good	Medium	Pass	Fail	Excellent	Good	Medium	Pass	Fail
Training Objective1	23 71.88%	8 25.00%	1 3.13%	0 0.00%	0 0.00%	36 66.67%	12 22.22%	4 7.41%	2 3.70%	0 0.00%	70 73.68%	17 17.89%	6 6.32%	2 2.11%	0 0.00%
Training Objective2	24 75.00%	7 21.88%	1 3.13%	0 0.00%	0 0.00%	34 62.96%	15 27.78%	4 7.41%	1 1.85%	0 0.00%	67 70.53%	20 21.05%	4 4.21%	4 4.21%	0 0.00%
Training Objective3	25 78.13%	6 18.75%	1 3.13%	0 0.00%	0 0.00%	32 59.26%	15 27.78%	6 11.11%	1 1.85%	0 0.00%	74 77.89%	13 13.68%	6 6.32%	2 2.11%	0 0.00%
Training Objective4	27 84.38%	2 6.25%	2 6.25%	1 3.13%	0 0.00%	31 57.41%	14 25.93%	7 12.96%	2 3.70%	0 0.00%	68 71.58%	15 15.79%	8 8.42%	3 3.16%	1 1.05%
Training Objective5	24 75.00%	7 21.88%	1 3.13%	0 0.00%	0 0.00%	33 61.11%	11 20.37%	9 16.67%	1 1.85%	0 0.00%	69 72.63%	17 17.89%	6 6.32%	2 2.11%	1 1.05%
Training Objective6	23 71.88%	5 15.63%	3 9.38%	0 0.00%	1 3.13%	32 59.26%	13 24.07%	7 12.96%	2 3.70%	0 0.00%	59 62.11%	22 23.16%	6 6.32%	7 7.37%	1 1.05%
Training Objective7	27 84.38%	4 12.50%	0 0.00%	1 3.13%	0 0.00%	36 66.67%	12 22.22%	6 11.11%	0 0.00%	0 0.00%	72 75.79%	18 18.95%	4 4.21%	1 1.05%	0 0.00%
Training Objective8	29 90.63%	2 6.25%	1 3.13%	0 0.00%	0 0.00%	38 70.37%	12 22.22%	4 7.41%	0 0.00%	0 0.00%	74 77.89%	16 16.84%	4 4.21%	1 1.05%	0 0.00%
Training Objectives	2016					2017					2018				
	Excellent	Good	Medium	Pass	Fail	Excellent	Good	Medium	Pass	Fail	Excellent	Good	Medium	Pass	Fail
Training Objective1	56 71.79%	18 23.08%	3 3.85%	1 1.28%	0 0.00%	35 56.45%	20 32.36%	4 6.45%	2 3.23%	1 1.61%	80 58.39%	37 27.01%	14 10.22%	5 3.65%	1 0.73%
Training	59 75.64%	14 17.95%	1 1.28%	3 3.85%	1 1.28%	25 40.32%	29 46.77%	6 9.68%	1 1.61%	1 1.61%	81 59.12%	38 27.74%	11 8.03%	7 5.11%	0 0.00%

Objective2															
Training Objective3	56 71.79%	18 23.08%	1 1.28%	3 3.85%	0 0.00%	28 45.16%	22 35.48%	9 14.52%	2 3.23%	1 1.61%	84 61.31%	39 28.47%	9 6.57%	4 2.92%	1 0.73%
Training Objective4	58 74.36%	16 20.51%	0 0.00%	4 5.13%	0 0.00%	28 45.16%	22 35.48%	7 11.29%	4 6.45%	1 1.61%	73 53.28%	40 29.20%	15 10.95%	8 5.84%	1 0.73%
Training Objective5	56 71.79%	19 24.36%	0 0.00%	3 3.85%	0 0.00%	27 43.55%	23 37.10%	8 12.90%	3 4.84%	1 1.61%	79 57.66%	36 26.28%	18 13.14%	4 2.92%	0 0.00%
Training Objective6	52 66.67%	20 25.64%	3 3.85%	3 3.85%	0 0.00%	27 43.55%	24 38.71%	7 11.29%	2 3.23%	2 3.23%	72 52.55%	40 29.20%	12 8.76%	10 7.30%	3 2.19%
Training Objective7	60 76.92%	17 21.79%	0 0.00%	1 1.28%	0 0.00%	36 58.06%	20 32.26%	4 6.45%	1 1.61%	1 1.61%	97 70.80%	29 21.17%	5 3.65%	6 4.38%	0 0.00%
Training Objective8	61 78.21%	16 20.51%	0 0.00%	1 1.28%	0 0.00%	42 67.74%	18 29.03%	1 1.61%	0 0.00%	1 1.61%	106 77.37%	25 18.25%	6 4.38%	0 0.00%	0 0.00%

Training Objective1：Have knowledge of mathematics, natural science, economy and management required for communication engineering, understanding the development trend and application prospect of modern science and technology.

Training Objective2：Master the programming language and software related to Communication Engineering, and be able to combine computer application and professional knowledge.

Training Objective3：Master basic knowledge of Communication Engineering and basic professional theoretical knowledge, have the ability to acquire and apply professional knowledge, have strong vocational practice skills and professional ability.

Training Objective4：Master the basic and advanced technical knowledge of electronic information field, have the ability to analyze, measure, evaluate and design various circuits in communication system and solve corresponding engineering problems; have the ability to understand and participate in the process of Communication Engineering practice, understand technical requirements and have the possibility of obtaining potential positions.

Training Objective5：Master the basic methods of literature retrieval and data query and the application of modern information technology to obtain relevant information, understand the basic knowledge of information technology and obtain and apply information effectively.

Training Objective6：Have certain ability in English writing and expression, be able to use the English knowledge well and read the English literature in electrical engineering domain with the help of dictionaries, and write the thesis English abstract.

Training Objective7：Have certain artistic accomplishment and aesthetic ability, good sense of social responsibility, humanities and social science literacy, engineering professional ethics, good team spirit and the ability of effective communication, coordination and cooperation, also certain abilities to organize and manage.

Training Objective8：Have a correct understanding of lifelong learning, and have the ability to acquire knowledge for continuous learning and adaptive development.

Table 3 Graduate Survey of Software Engineering

Training objective	Goodness of fit														
	2013					2014					2015				
	Excellent	Good	Medium	Pass	Fail	Excellent	Good	Medium	Pass	Fail	Excellent	Good	Medium	Pass	Fail
Training objective 1	5 50.00%	1 10.00%	2 20.00%	2 20.00%	0 0.00%	8 50.00%	3 18.75%	3 18.75%	2 12.50%	0 0.00%	8 66.67%	2 16.67%	2 16.67%	0 0.00%	0 0.00%
Training objective 2	5 50.00%	1 10.00%	3 30.00%	1 10.00%	0 0.00%	8 50.00%	5 31.25%	1 6.25%	2 12.50%	0 0.00%	7 58.33%	3 25.00%	2 16.67%	0 0.00%	0 0.00%
Training objective 3	6 60.00%	0 0.00%	2 20.00%	2 20.00%	0 0.00%	8 50.00%	5 31.25%	1 6.25%	2 12.50%	0 0.00%	6 50.00%	4 33.33%	2 16.67%	0 0.00%	0 0.00%
Training objective 4	6 60.00%	1 10.00%	1 10.00%	2 20.00%	0 0.00%	8 50.00%	4 25.00%	1 6.25%	3 18.75%	0 0.00%	7 58.33%	1 8.33%	3 25.00%	0 0.00%	1 8.33%
Training objective 5	5 50.00%	2 20.00%	0 0.00%	3 30.00%	0 0.00%	8 50.00%	4 25.00%	2 12.50%	2 12.50%	0 0.00%	5 41.67%	2 16.67%	4 33.33%	0 0.00%	1 8.33%
Training objective 6	6 60.00%	0 0.00%	1 10.00%	3 30.00%	0 0.00%	8 50.00%	4 25.00%	1 6.25%	3 18.75%	0 0.00%	3 25.00%	7 58.33%	1 8.33%	0 0.00%	1 8.33%
Training objective 7	5 50.00%	2 20.00%	2 20.00%	1 10.00%	0 0.00%	10 62.50%	3 18.75%	1 6.25%	2 12.50%	0 0.00%	7 58.33%	3 25.00%	2 16.67%	0 0.00%	0 0.00%
Training objective 8	6 60.00%	1 10.00%	1 10.00%	2 20.00%	0 0.00%	11 68.75%	3 18.75%	1 6.25%	1 6.25%	0 0.00%	8 66.67%	2 16.67%	2 16.67%	0 0.00%	0 0.00%
Training objective	2016					2017					2018				
	Excellent	Good	Medium	Pass	Fail	Excellent	Good	Medium	Pass	Fail	Excellent	good	Medium	Pass	Fail
Training objective 1	7 46.67%	5 33.33%	3 20.00%	0 0.00%	0 0.00%	13 59.09%	5 22.73%	4 18.18%	0 0.00%	0 0.00%	14 46.67%	11 36.67%	3 10.00%	2 6.67%	0 0.00%
Training objective 2	7 46.67%	6 40.00%	1 6.67%	1 6.67%	0 0.00%	13 59.09%	5 22.73%	3 13.64%	1 4.55%	0 0.00%	17 56.67%	8 26.67%	3 10.00%	2 6.67%	0 0.00%
Training objective 3	8 53.33%	6 40.00%	1 6.67%	0 0.00%	0 0.00%	12 54.55%	7 31.82%	3 13.64%	0 0.00%	0 0.00%	16 53.33%	9 30.00%	3 10.00%	2 6.67%	0 0.00%

Training objective 4	6 40.00%	6 40.00%	2 13.33%	1 6.67%	0 0.00%	11 50.00%	9 40.91%	1 4.55%	1 4.55%	0 0.00%	16 53.33%	9 30.00%	2 6.67%	3 10.00%	0 0.00%
Training objective 5	6 40.00%	5 33.33%	4 26.67%	0 0.00%	0 0.00%	11 50.00%	7 31.82%	3 13.64%	1 4.55%	0 0.00%	12 40.00%	12 40.00%	3 10.00%	3 10.00%	0 0.00%
Training objective 6	5 33.33%	5 33.33%	3 20.00%	1 6.67%	1 6.67%	9 40.91%	7 31.82%	6 27.27%	0 0.00%	0 0.00%	14 46.67%	8 26.67%	6 20.00%	2 6.67%	0 0.00%
Training objective 7	7 46.67%	5 33.33%	3 20.00%	0 0.00%	0 0.00%	14 63.64%	5 22.73%	3 13.64%	0 0.00%	0 0.00%	19 63.33%	8 26.67%	1 3.33%	2 6.67%	0 0.00%
Training objective 8	8 53.33%	5 33.33%	2 13.33%	0 0.00%	0 0.00%	16 72.73%	4 18.18%	2 9.09%	0 0.00%	0 0.00%	19 63.33%	7 23.33%	2 6.67%	2 6.67%	0 0.00%

Training objective 1: Having knowledge of mathematics, natural sciences, and economic and management required to work in computer science and technology, and understanding general computer principles and application knowledge.

Training objective 2: Mastering the basic methods of literature search, data query and using modern information and technology to obtain relevant messages; understanding the basic knowledge of information technology; and effectively acquiring and applying formation.

Training objective 3: Developing scientific ways of thinking, engineering design methods and good engineering literacy;

Training objective 4: Mastering the knowledge and skills of software engineering and possessing the professional skills required by software engineers to engage in engineering practice;

Training objective 5: Building the capabilities to analyze, design and, develop system software and application software; and reaching a certain level of innovation awareness and ability in basic research and development, engineering design and practice.

Training objective 6: Gaining ability in English writing and expression and adopting English knowledge in reading English literature in the field of computer software, and writing an abstract in English with the help of dictionary.

Training objective 7: Building a certain artistic accomplishment, aesthetic ability, good sense of social responsibility, humanities and social science literacy; engineering professional ethics, good team spirit; effective communication, coordination and cooperation ability, certain organizational management capabilities;

Training objective 8: Having a correct understanding of lifelong learning and the ability to acquire knowledge, continuous learning and adapt to development.

Table 4 Graduate Survey of Internet of Things Engineering

Training objective	Goodness of fit														
	2013					2014					2015				
	Excellent	Good	Medium	Pass	Fail	Excellent	Good	Medium	Pass	Fail	Excellent	Good	Medium	Pass	Fail
Training objective 1	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	2 66.67%	1 33.33%	0 0.00%	0 0.00%	1 100%	0 0.00%	0 0.00%	0 0.00%	0 0.00%
Training objective 2	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	1 33.33%	2 66.67%	0 0.00%	0 0.00%	0 0.00%	1 100%	0 0.00%	0 0.00%	0 0.00%	0 0.00%
Training objective 3	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	2 66.67%	1 33.33%	0 0.00%	0 0.00%	1 100%	0 0.00%	0 0.00%	0 0.00%	0 0.00%
Training objective 4	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	2 66.67%	1 33.33%	0 0.00%	1 100%	0 0.00%	0 0.00%	0 0.00%	0 0.00%
Training objective 5	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	2 66.67%	0 0.00%	1 33.33%	0 0.00%	1 100%	0 0.00%	0 0.00%	0 0.00%	0 0.00%
Training objective 6	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	3 100%	0 0.00%	0 0.00%	0 0.00%	1 100%	0 0.00%	0 0.00%	0 0.00%	0 0.00%
Training objective 7	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	2 66.67%	0 0.00%	1 33.33%	0 0.00%	0 0.00%	1 100%	0 0.00%	0 0.00%	0 0.00%	0 0.00%
Training objective 8	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	1 33.33%	2 66.67%	0 0.00%	0 0.00%	0 0.00%	1 100%	0 0.00%	0 0.00%	0 0.00%	0 0.00%
Training objective	2016					2017					2018				
	Excellent	Good	Medium	Pass	Fail	Excellent	Good	Medium	Pass	Fail	Excellent	good	Medium	Pass	Fail
Training objective 1	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	13 92.86%	1 7.14%	0 0.00%	0 0.00%	0 0.00%	9 45.00%	7 35.00%	2 10.00%	2 10.00%	0 0.00%
Training objective 2	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	13 92.86%	1 7.14%	0 0.00%	0 0.00%	0 0.00%	7 35.00%	7 35.00%	2 10.00%	4 20.00%	0 0.00%
Training objective 3	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	9 64.29%	5 35.71%	0 0.00%	0 0.00%	0 0.00%	4 20.00%	10 50.00%	3 15.00%	2 10.00%	1 5.00%

Training objective 4	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	10 71.43%	4 28.57%	0 0.00%	0 0.00%	0 0.00%	6 30.00%	8 40.00%	2 10.00%	0 0.00%	4 20.00%
Training objective 5	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	11 78.57%	3 21.43%	0 0.00%	0 0.00%	0 0.00%	5 25.00%	7 35.00%	4 20.00%	1 5.00%	3 15.00%
Training objective 6	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	12 85.71%	2 14.29%	0 0.00%	0 0.00%	0 0.00%	9 45.00%	6 30.00%	3 15.00%	1 5.00%	1 5.00%
Training objective 7	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	11 78.57%	3 21.43%	0 0.00%	0 0.00%	0 0.00%	9 45.00%	9 45.00%	1 5.00%	1 5.00%	0 0.00%
Training objective 8	0 0.00%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	13 92.86%	1 7.14%	0 0.00%	0 0.00%	0 0.00%	10 50.00%	8 40.00%	2 10.00%	0 0.00%	0 0.00%

Training Objective 1: Master the basic theories and knowledge of Computer Science, Communication and Computer Network, which are closely related to the Internet of Things;

Training Objective 2: Master knowledge and professional skills about sensor technology, communication technology, embedded system technology and RFID technology necessary for Internet of Things engineering

Training Objective 3: Master the basic theories and technologies in the field of Internet of Things Engineering, and be qualified to solve practical problems flexibly with basic knowledge and skills;

Training Objective 4: Be able to design and develop hardware and software of Internet of Things;

Training Objective 5: Be capable of engineering design, construction, installation, test, operation, maintenance and management of Internet of Things;

Training Objective 6: Have certain abilities in English writing and expression and to read English literature in the field of computer software as well as write thesis English abstract with the help of dictionaries and basic knowledge of English

Training objective 7: Have certain artistic accomplishment and aesthetic ability, good sense of social responsibility, humanities and social science literacy, engineering professional ethics,good team spirit and the ability of effective communication,coordination and cooperation, also certain abilities to organize and manage;

Training objective 8: Have a correct understanding of lifelong learning, and have the ability to acquire knowledge for continuous learning and adaptive development.