

# Development of a surveying engineering technology program: From certificate to BS degree

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## ABSTRACT

The College of Technology at the University of Houston together with Lone Star College proposes to develop a programs in Land Surveying Engineering Technology. The proposed program will address two goals 1) a certificate program to enhance the skill set of the associate degree graduates and 2) ultimately will lead to a BS degree in organizational Leadership and Supervision (OLS). The certificate program consists of five courses. Theses five courses will be developed as college level courses that could be either used as a minor in Construction Management program or in Civil Engineering Technology program. In addition, the courses can be transferred into a BS program for those who seek to obtain a BS degree in OLS. The highlights of this program are the acceleration of skill enhancement of those land surveying field crew and office technicians and their re-development in Land Surveying based on the new technology and provide the opportunity for those who are choosing the Land Surveying profession as career. This program will provide skilled workforce to the Land Surveying Firms, Texas Department of Transportation, and other organization involved in Land Surveying. Once developed the certificate and BS degree programs will be available for adoption with interested institutions.

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## 1. INTRODUCTION

There is a significant shortage of the land surveyors in the United States according to the Texas Society of Professional Surveyors (TSPS) and Texas Board of Professional Land Surveying (TBPLS). In addition as the number of retiring Registered Professional Land Surveyors (RPLS) increasing, while at the same time numbers of new Registered Professional Land Surveyor are decreasing. Opportunities for Registered Professional Land Surveyors in Texas and other states are boundless. Combining detective work with high tech field measurements, computer aided design and calculations and drafting. Land surveyors are integral part of land development and growth across the state. Land surveyors hold respected positions among professionals and compensation for Registered Professional Land Surveyors and Land Surveying Technicians continue to grow enormously.

A salary survey of members of the Texas Society of Professional Surveyors (from 2009) found an average annual salary of \$89,452 for RPLSs, \$76,517 for RPLSs licensed 5 years or less, and \$91,874 for RPLSs licensed 5 years or more.<sup>1</sup> None registered professional land surveyor such as; Surveyors in Training, Office Technicians, Party Chiefs, and Instrument Persons are also well compensated, earning on average of \$49,255 annually. Based on the information obtained from several land surveying firms in Houston the 2014 RPLS average annual salary is close to \$100,000.

## 2. NEED FOR LAND SURVEYING PROGRAM

As it was mentioned at the introduction, when you consider demand for RPLSs has increased while the number of registered professional land surveyors in Texas has actually decreased due to retirement. At present time the land surveying career path is in high demand. The demand for land surveyors will continue to increase for land surveyors whether working for an existing surveying or engineering company, a government agency such as Texas Department of Transportation (TxDOT) or private land surveying business.

## 3. REGISTERED PROFESSIONAL LAND SURVEYOR

To become a Registered Professional Land Surveyor (RPLS) in the State of Texas and majority of other States, an individual must take and pass Surveyor in Training Exam (SIT). To qualify and be approved by Texas Board of Professional Land Surveyors for SIT exam one must;<sup>2</sup>

- Hold a Bachelor of Science in Surveying or,
- Hold a Bachelor's degree with 32 hours in Civil Engineering, Land Surveying, Math, Photogrammetry, Forestry, Land Law or the Physical Science and one year of experience working under a RPLS or,
- Hold an Associate's degree in Surveying and have two years of experience working under a RPLS or,
- Have 32 hours in Land Surveying courses and two years of experience working under a RPLS or,
- Graduated from high school, have four years of experience working under an RPLS and can prove that you are self-educated in land surveying.

To become a Registered Professional Land Surveyor after obtaining Survey in Training certificate and Bachelor Degree with 32 hours of land surveying or related college credited course, an individual must take and pass an eight hours of Fundamental Land Surveying exam. Four years of experience working under a RPLS. Take and pass eight hours of TBPLS prepared exam. The following community colleges offer either certificate of technology and /or Associate of Applied Science degree in Land Surveying.

1. Lone Star Community College
2. Houston Community College System
3. Austin Community College System
4. North Lake Community College
5. Tyler Junior College

## 4. SUPPORT FROM INDUSTRY

Texas Society of Professional Surveyors (TSPS) particularly Texas Gulf Coast Chapter 9 have indicated their willingness to support this workforce training and Surveying education both financially and in advisory capacity.

TSPS Educational Foundation has committed financial help to start the program. They also have scholarship fund available for surveying students.

Before developing the Land Surveying program, it will be essential to form an industrial advisory board consist of representative from major land surveying companies and TSPS.

## **5. CERTIFICATE OF TECHNOLOGY AND ASSOCIATE DEGREE IN LONE STAR COLLEGE, AND OTHER COMMUNITY COLLEGES**

The following are the list of available certificate and associate degree programs in surveying in greater Houston area.

- Certificate of Technology, The Land Surveying Certificate of Technology is designed for land surveying occupational employment. This certificate is awarded upon completion of 33–36 college credited hours in land surveying for the purpose of developing and upgrading skills in land surveying. In addition it also prepare students to take the National Society of Professional Surveyors (NSPS) leve11 and 111 land surveying Technician exam.NSPS has four levels of land surveying technicians, level 1,11,111 and 1V, level 1 being entry level technician, level 1V is more advanced surveying technician with more responsibility<sup>3</sup>.

The following are approved courses for Certificate of Technology in Land Surveying:<sup>4</sup>

SRVY 1301 Introduction to Surveying  
 DFTG 1309 Basic Computer Aided Drafting  
 SRVY 1413 Plane Surveying  
 SRVY 1441 Land Surveying  
 SRVY 2343 Surveying Legal Principle  
 SRVY 2313 Control Surveying  
 SRVY 1315 Surveying Calculations 1  
 SRVY 1319 Introduction to Geographic Information Systems  
 SRVY 1349 Surveying Calculations 11  
 SRVY 1342 GPS Techniques for Surveying  
 SRVY 2487 Internship  
 SRVY 1171 Capstone Exam Review

- Associate of Applied Science Degree, the land surveying Associate of Applied Science degree prepare student to take either level 1V NSPS certification for land surveying technician or with two years' experience in land surveying take Texas Board of Professional Land Surveying (TBPLS) surveying in training (SIT) exam.

Total of 61–64 college credit hours including core and major courses are required for the associate degree in land surveying.

The following are courses in addition to the required courses for the Certificate of Technology for Associates of Applied Science in Land Surveying

ENGL 1301 English Composition 1  
 SPCH 1311 Introduction to Communication, or  
 SPCH 1315 Public Speaking, or  
 SPCH 1318 Interpersonal Communication  
 PHED 1164 Introduction to Physical Fitness  
 MATH 1314 College Algebra  
 GEOG 1300 Principle of Geography  
 SRVY 2342 Surveying Legal Principle 11  
 SRVY 2309 Computer Aided Mapping  
 Hours of Humanity or Fine Arts  
 MATH 1316 Trigonometry  
 GEOG 1303 World Geography

## **6. PROPOSED BACHELOR OF SCIENCE DEGREE IN ORGANIZATIONAL LEADERSHIP AND SUPERVISION (OLS)/LAND SURVEYING (LS)**

The proposed Bachelor of Science Degree for Organizational Leadership and Supervision/Land Surveying is designed for students with Associate of Applied Science degree in Land Surveying to farther their education in land surveying and at the same time learn supervision of land surveying firms.

The following are the list of required courses in addition to Core Requirements for BS degree in (OLS/LS):<sup>5</sup>

Major Requirements (57 SH)

PHIL 1321 Logic 1  
 LOGT 2362 Intro to Logistics Technology  
 DIGM 3353 Visual Communications Technology  
 TELS 3340 Org Leadership and Supervision  
 TELS 3345 Human Resources in Technology  
 TELS 3355 Project Leadership  
 TELS 3365 Team Leadership  
 TMTM 3360 Applied Tech Statistics  
 TELS 4341 Production & Service Operations  
 TELS 4342 Quality Improvements Method  
 TELS 4371 Leading Change in Workplace  
 TELS 4372 Proposal and Project Writing  
 TELS 4390 Current Issues in TLS  
 TELS 4378 or DIGM 4378 Sr. Project  
 SRVY 3365 Surveying 111  
 SRVY 4364 Surveying 1V  
 SRVY 4369 Surveying Analyses  
 SRVY 4397 Selected Topic in Land Surveying  
 GEOL 4331 Geographic Information System

## **7. ARTICULATION AGREEMENT BETWEEN THE UNIVERSITY OF HOUSTON, COLLEGE OF TECHNOLOGY AND LONE STAR COLLEGE DISTRICT**

The College of Technology at the University of Houston and Lone Star College District have developed articulation agreement for students who choose to complete a technical program at any of Lone Star College campuses and transfer to the University of Houston, College of Technology to earn a Bachelor of Science degree.

## **8. CONCLUSIONS**

A recent survey indicated that more than 50% of Land Surveying firms and related businesses in Texas are located in Greater Houston and Gulf Coast areas

The proposed certificate and educational program provide skill sets for the graduate of associate degrees to seek employment and a pathway to obtain a BS degree in OLS/LS.

## **REFERENCES**

- [1] Texas Society of Professional Surveyors (TSPS) website.
- [2] Texas Board of Professional Land Surveyor (TBPLS).
- [3] National Society of Professional Surveyors (NSPS) website.
- [4] Texas Higher Education Coordinating Board (THECB).
- [5] Department of Information and Logistics Technology, COT, UH.