TSA Surveying Course
with ProQual Level 3 Diploma in Engineering Surveying

COURSE DETAILS

Held at:
The Survey School
Waterworks Road
Worcester WR1 3EZ

Telephone: 01905 26329
Email: office@surveyschool.org.uk

TSA Surveying Course

with ProQual Level 3 Diploma in Engineering Surveying

The TSA Surveying Course has been created specifically for the development of new entrants into the Geomatics industry, or those with experience but no formal training.

It is now run alongside the ProQual Level 3 Diploma in Engineering Surveying.

IT IS INTENDED TO BROADEN THE STUDENT'S PRACTICAL EXPERIENCE AND TO SUPPLEMENT THE THEORETICAL EXPERIENCE GAINED FROM THEIR EMPLOYER.

Emphasis is placed on the provision of technical knowledge to enable the execution of surveying tasks within the workplace.

The overall aim is to enhance the contribution each student will make to their Employer's organisation, and for the students to achieve a recognised qualification and become competent Survey Technicians.

Graduation (passing all six blocks) from the course will fulfil 100% of the academic requirement for those wishing to upgrade from Student to Technical membership of Chartered ICES. The student also requires 3 year's relevant experience, a detailed CV, detailed experience report, 1 years' worth of CPD reports and a completed Principal Sponsor Form.

The TSA Surveying Course provides 50% of the points required for the RICS Associate (AssocRICS) qualification.

The TSA Course is now run alongside the ProQual Level 3 Diploma in Engineering Surveying. This provides a successful candidate with a recognised qualification and standard which is recognised by CSCS. Although this will be registered and billed separately, it requires minimal additional effort for a candidate completing all six blocks.

Concept

- The course is broken down into six two-week blocks spread over two years
- As both the course and student's experience progress, a broader spectrum of subjects is covered in greater depth
- Theory is taught as an aid to understanding the principles behind the practical application
- Mathematical skills are taught as appropriate to the practical applications in each block
- Emphasis will be placed on students thinking through problems for themselves.

Course material

The material produced is intended for course use and as an aide memoir to the subjects covered. It is also a reference for general surveying; it is not meant to be a substitute textbook or an exhaustive coverage of the subject.

Technology

Surveying technology is constantly changing and new hardware and software solutions are regularly being introduced to the work place. It is the aim of this course to inform students of the latest developments and to outline what is now possible and what will soon be possible. Recent developments in GNSS, SUAV's and in Laser scanning are typical examples.

It is neither practical nor desirable to demonstrate every different type of Total Station, GNSS system or software solution. The aim of the course is to illustrate, using modern industry standard instruments and programs, how to achieve the survey aims set out in each of the blocks.

To demonstrate first principles, basic equipment will be used with methods that ensure the student understands what is happening and is not just a button presser with no understanding of the workings of the black box.

Aims and Outcomes

Students will be encouraged to share their experiences and methods of working which will contribute to the body of knowledge and be of mutual benefit to all the students

Set out below are the main aims and expected learning outcomes of the six blocks. These complement the initial course overview and the individual block synopsis.

Block Details

01 INTRODUCTION TO SURVEYING AND COMPUTATIONS

Aim:

To teach basic measurement skills for the control of a small topographical survey. Have an appreciation of scale and specification and to convey an understanding of numerical and mathematical techniques, which underpin surveying, and in particular basic trigonometry. Gaining sound principles from the understanding of historical measurement methods. Understand and know how to apply identify the relevant Health & Safety precautions required.

Outcome:

1. To be able to use a total station, level and tape with confidence and carry out basic collimation and two peg tests.
2. Have a good knowledge of observing, booking and calculation techniques.
3. Be able to deal with problems using a mathematical approach and a hand held calculator.
4. Have a clear understanding of scale, accuracy, precision and checking.
5. Understand Health & Safety requirements relevant to a typical topographical land survey.
6. Write a spreadsheet to calculate and adjust levelling.

02 CONTROL AND DETAIL SURVEYING

Aim:

To be able to carry out a small topographical survey in the urban or rural environment with an appreciation for the requirements of specification, scale and the presentation of features in both plan and height. To understand the requirements of monitoring surveys. Be able to confidently compute and adjust a Traverse by a variety of methods. Calculate triangles of any shape. Create contours and sections across the survey. Understand the importance of prism constants and atmospheric correction in distance measurement.

Outcome:

1. To be able to use modern Total stations and digital levels in an applied manner.
2. Know how to acquire, compute, analyse and present survey data both by hand and by computer software.
3. The able to compute a triangle using both the sign or and cosine rules.
4. Be able to utilize traversing, polar radiation, Stadia tachometry and chain surveying methods.
5. Be able to survey and plot a simple topographical section.
6. Interpolate contours manually and by computer.
7. Use a digital level observe and present a monitoring survey report
8. Carry out a test for prism constant and apply atmospheric corrections to distances.

03 PROJECTIONS, GRIDS AND GNSS

Aim:

To have an understanding of basic projections, grids and the shape of the earth, and how working on a curved earth effects surveying. To be able to understand the equipment and methods used in GNSS and photogrammetry. Have a knowledge of other types of intersection and resection survey calculation, and to know how they can be applied manually, in the instrument and graphically.

Outcome:

1. To be able to use GNSS and digital surveying equipment in an applied manner.
2. Know how to provide survey data for other users.
3. Solve problems and choose the best surveying method for solving these problems.
4. Be aware of the capability and limitations of photogrammetry and GNSS surveying.
5. Be able to observe and compute intersection and resection.
6. Use co-ordinates in both a local plane grid and the OS National grid with scale factor
7. Identify points suitable for photo control and plan a theoretical photography sortie.

04 MEASURED BUILDING AND SPECIALIST SURVEYS

Aim:

To acquire and apply specific detailed survey knowledge for specialist survey types. In particular measured building surveys, in plan elevation and cross section. Understand the role of laser scanning particularly or measured building surveys. To have a theoretical and practical understanding of undertaking utility surveys and surveying underground. Understand the requirements of an inshore hydrographic, harbour, lake or river survey. Understand the additional health and safety risks associated with these types of surveys.

Outcome:

1. Carry out a simple measured building survey both un-controlled and fully controlled.
2. Present survey information in plan, elevation and section. With calculated floor areas.
3. See a scanner demonstrated and learn the requirements of cloud.
4. Carry out simple underground utility tracing using radio detection, ground penetrating radar, and visual inspection.
5. Have a theoretical view of inshore hydrographic surveys and river cross sections.
6. Learn of the additional health and safety risks associated with working in buildings and on or near the water.

05 CONSTRUCTION AND ENGINEERING SURVEYS

Aim:

To acquire and apply specific detailed survey knowledge to the engineering and construction industry in both surveying and setting out, with an appreciation of the different constraints and pressures in a dynamic environment. Be able to conduct simple engineering surveying and setting out tasks with confidence and have the ability to make, and check calculations and the points set out. Understand the role of tolerances. Be able to upload and down load survey and setting out information from the Total station.

Outcome:

1. Set out Locations for buildings, structures, roads and drainage.
2. Set out grids, gradients circular curves and vertical curves by co-ordinates, “bearing and distance” and reference line offset methods.
3. Use a tape, level and staff and total station for setting out and checking work.
4. Use both the internal programs on the total station and hand calculations for this.
5. Conduct “As Built surveys” and compare them against the original design.

06 SURVEY MANAGEMENT AND COMPUTER PROCESSING

Aim:

To understand the planning behind survey tasks, dealing with the survey team, the client and the public. To be able to read and produce a job specification and a job report and estimate the time for a topographic survey. To consider the organization and management of a commercial survey company.
Be able to observe and calculate of volumes.
To appreciate and practice the use of computer solutions in the manipulation and presentation of three dimensional and attributed data for GIS and Industrial metrology.
Be confident in presenting ideas to others and be able to see how to advance ones career by joining a professional body. Be aware of the requirements for a surveyor acting as an expert witness in a legal survey dispute and in providing information for the Land Registry.

Outcome:

1. Be able to survey data for 3D models.
2. Observe and compute areas of land for sub divisions cut and fill volumes.
3. Be familiar with the methods required for complex data capture and presentation for GIS Systems.
4. Produce a method statement risk assessment and specification
5. Write a survey program assist in the planning and management of a survey project.
6. Give a short presentation to the class
7. Write a spread sheet to calculate and adjust a traverse.
8. Hear from speakers on GIS, industrial metrology and legal surveys.

Prices (1st May 2022)

	TSA Member	Non TSA Member
TSA Course		
Option 1 - Discounted Rate Three Blocks Paid in Advance. Cost per block	£3,300.00 (£1,100.00 x 3)	£4,560.00 (£1,520.00 x 3)
Option 2 - Standard Rate Each Block Paid Separately. Cost per block	£1,200.00	£1,595.00
Option 3 - CICES 10% Discount – Cost per Block or Three Blocks paid in Advance	Not Applicable	£1,435.00 (£4,305.00)
ProQual Level 3 Diploma (one off payments)		
Registration	£60.00	£110.00
Assessment	£380.00	£765.00
Certification	£85.00	£175.00
Re-application (if applicable – see T&Cs)	£110.00	£215.00

All prices are net of VAT

Assessment

During each block the students have assessed, class exercises which will accurately chart their achievement against the block aims. There is also a formal written examination taken by the student at the end of each block.

The results of these assessments will highlight both strengths and limitations, and are provided to the employer as a written report at the end of each block. Students are also able to discuss the results of the assessments, assignments, and their work in general during the block.

Assignments

At the end of blocks 1 to 5, the employer will be provided with details of the “work experience” assignment tasks. Students should complete these assignments prior to commencing the next block.

The marked assignments are an integral part of the course that reinforce what has been learnt and lead to further development.

It is important that students are encouraged and assisted, where necessary, to do this work.

- For the first block students observe and compute a 4 leg traverse on a local grid. This is also levelled. A comparison is made between trig heights and level and station descriptions are drawn.
- For the second block a triangle of control is observed and computed by trilateration. Detail is observed by chain survey, Stadia radial detail with level and staff and with a total station. The results if the three survey methods are combined into one drawing on a site survey grid and contours are added. A long section is drawn across the survey area.
- For the third block two new stations are fixed by intersection and by resection from for known control stations. Calculations compare the results of each method.
- For the fourth block the students observe a measured building survey on two floors. Floor plans, with net internal areas, a building cross-section and an elevation are drawn.
- For the fifth block the project is a theoretical housing estate to be set out on a plot of land. Students are given a sample site survey and must describe the method of surveying the plot and setting out a new road with a horizontal and vertical curve. They must also add and describe how to set out a house with drainage to the new road.

Graduation and Awards

At the end of the course there will be a Graduation and Award Ceremony with the presentation of prizes for the students in that year group.

The 6 exams make up for 40% of the final marks. The 6 sets of class work make up 20% of the final marks. The 5 assignments make up the final 40% of the final marks.

Student with an overall score of 85% or more gain a distinction, those with 75% or more a merit and the Pass mark is 50%.

There is a prize awarded to the best student of the year group by TSA and Leica Geosystems.

A prize is also awarded for the best assignment, by the Chartered Institution of Civil Engineering Surveyors (ICES).