

TSA TRAINING COURSE

INTRODUCTION TO SURVEYING

THE TSA SURVEY TECHNICIAN TRAINING 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 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.

The Institution of Civil Engineering Surveyors (ICES) recognise the successful completion of the "TSA Introduction to Surveying Course" as a route to Technical Membership.

The Royal Institution of Chartered Surveyors (RICS) recognise that successful completion of the course will provide 50 points towards the 100 points required for RICS Technical Membership.

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

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 GPS and in Laser scanning are typical examples.

It is neither practical nor desirable to demonstrate every different type of total station, GPS 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 students understand what is happening and are not just button pressers with no understanding of the workings of the black box.

Aims and Outcomes

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

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BLOCK 1 BASIC SURVEYING AND ARITHMETIC

Basic Surveying Aim	To teach basic measurement skills for control of a small topographical survey with appreciation of scale and specification.
Outcome	To be able to use a theodolite, level and tape with confidence and have a good knowledge of observing, booking and calculation techniques.
Maths Aim	To convey an understanding of numerical and mathematical techniques which underpin surveying, and in particular basic trigonometry and the solution of right angled triangles.
Outcome	To be able to deal with problems using a mathematical approach and have a clear understanding of accuracy, precision and checking.

BLOCK 2 CONTROL AND DETAIL SURVEY

Aim	To be able to carry out a small topographical survey in the built or rural environment with an appreciation of the requirements of specification, scale and presentation of features in both plan and height.
Outcome	To be able to use simple survey equipment in an applied manner to acquire, compute, analyse and present survey data. Methods to be used include tachometry, polar radiation and chain survey techniques.

BLOCK 3 PROJECTIONS AND GRIDS, GPS SURVEYING AND PHOTOGRAMMETRY

<p>Aim</p>	<p>To have an understanding of basic projections and grids and the shape of the earth. To be able to understand equipment and methods that require more detailed survey knowledge, of measurement and calculation, and to know how they can be applied.</p>
<p>Outcome</p>	<p>To be able to use GPS and digital surveying equipment in an applied manner to acquire data, and provide data, for other users. To solve problems and choose the best method of solving these problems. To be aware of the capability and limitations of photogrammetry and GPS surveying and also understand the principles behind them. To be able to observe and compute intersection and resection. To be able to use co-ordinates in both a local plane grid and the OS National grid.</p>

BLOCK 4 MEASURED BUILDING AND SPECIALIST SURVEYS

<p>Aim</p>	<p>To acquire and apply specific detailed survey knowledge for specialist survey types. In particular, building internal surveys, structure elevations and cross sections. To understand the requirements of monitoring surveys.</p>
<p>Outcome</p>	<p>To be able to survey a simple building and present a survey plot in plan, elevation and section. To be able to survey and plot a simple topographical section. To be able to use a digital level and present a monitoring survey report.</p>

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BLOCK 5 CONSTRUCTION AND ENGINEERING SURVEYS

<p>Aim</p>	<p>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.</p>
<p>Outcome</p>	<p>To be able to conduct simple construction survey and setting out tasks such as grid, gradient and curves by co-ordinates, bearing and distance or offset methods.</p>

BLOCK 6 SURVEY MANAGEMENT AND ADVANCED COMPUTER USAGE

<p>Survey Management Aim</p>	<p>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. To consider the organisation and management of a commercial survey company.</p>
<p>Outcome</p>	<p>To appreciate and practise the use of computer solutions in the manipulation and presentation of three dimensional and attributed data.</p>
<p>Advanced Computer Usage Aim</p>	<p>To appreciate and practise the use of computer solutions in the manipulation and presentation of three dimensional and attributed data.</p>
<p>Outcome</p>	<p>To be able to survey data for 3D models and compute cut and fill volumes. To be familiar with the methods required for complex data capture and presentation for GIS Systems.</p>

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ASSESSMENT

DURING EACH BLOCK THE STUDENTS WILL HAVE A FORMAL ASSESSMENT, WHICH WILL ACCURATELY CHART THEIR ACHIEVEMENT AGAINST THE BLOCK AIMS. THESE ASSESSMENTS WILL HIGHLIGHT BOTH STRENGTHS AND LIMITATIONS, AND ARE PROVIDED TO THE EMPLOYER AS A WRITTEN REPORT AT THE END OF EACH BLOCK. THE ASSESSMENTS WILL ALSO BE DISCUSSED WITH THE STUDENTS.

At the end of each block, 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.

At the end of the course there will be a Graduation Ceremony and presentation of awards. Final summary reports of the Students’ results and grades will be produced.