



Best elearning Course, 2008

Six Sigma Green Belt Course – IT Sligo

The Six Sigma Green Belt course is delivered over a full academic year from September – May. The programme comprises of three modules which are as follows:

- Six Sigma I (Introduction & Quality Tools)
- Six Sigma II (Applied Statistical Control)
- Six Sigma III (Work Based Project)

The delivery of the six sigma modules I & II in parallel with the six sigma project allows the student to use the tools for a real life project thus gaining a better understanding of the six sigma methodology. This ‘learning by doing’ approach also allows for better integration of the tools into the students workplace. Full details of each module are at the end of the page.

The three modules followed by the 1 day workshop cover the requirements of the Six Sigma Green Belt award. This flexible approach will allow for cost savings and participation at all levels within the organisation from supervisor and technician through to engineering and management level.

Six Sigma Green Belt Course

Module	Credits	Cost Per Student €	Cost for Ulearning Skillnet members*	Duration	Dates
Six Sigma I (Introduction & Quality Tools)	5	658	395	6 Months	Sep 22nd – Dec 2008
Six Sigma II (Applied Statistical Control)	5	658	395	6 Months	Jan – May 2009
Six Sigma III (Work Based Project)	5	658	395	12 Months	Sep 22 nd - May 2009
Total (3 Modules) Green Belt	15	€1974	€1185	12 Months	
External Six Sigma Green Belt Exam & Workshop	N/A	€200	€200	1 Day	June 2009

Note: * Discount applies for students where their company becomes a member of ULearning Skillnet. Further details below.

For example, students who just want an introduction to Six Sigma at the Green Belt level could take Six Sigma I. If more detailed Six Sigma statistical knowledge is required, students could then take Six Sigma II and Six Sigma III. Students can also attend the IT Sligo induction for online learners in September where they would receive training on the online learning system Moodle and an introduction to their Six Sigma lectures. The costs shown above include course fees, examinations fees, access to the online lectures, access to the Learning Management system Moodle where course notes and reading material are provided. The only additional cost for the student is the cost of textbooks and Minitab software which is estimated to be approx €150 per student.

ULearning Skillnet

Employees from the ULearning Network Group member companies are eligible for a 40% tuition discount. To receive the discount, your organisation must be registered as a member of the ULearning Network. In order to join the network your company representative must agree to the following criteria:

- Company must meet the Skillnets participation criteria - i.e. Not public sector companies and must provide financial support for student fees.
- Company must agree to have representation on the ULearning Steering Group
- Attend meetings where possible, or send representative
- Participate in discussion forums, emails etc.
- Willing to be listed as a ULearning Member Company
- Support ULearning evaluators when required
- Consider becoming industry mentor for student projects
- Active participation on any ULearning marketing campaigns, workshops, launches etc.
- Co-operate with Skillnets Manager with reference to completing company profile forms to enable network to address future needs
- Consider facilitating individuals who participate from their organisation on courses with study leave, exam leave, shift patterns, etc.
- Further information from: Email: Info@ulearning.ie

Six Sigma Green Belt Exam

Certification to Green Belt is organised through an Irish based training company. The Green Belt fee of €200 covers a 1 day workshop for Green Belt exam revision along with the cost of the exam. It includes:

- Set of notes to cover the Green Belt exam material
- Sample Set of Exam Questions
- Access to On Line Study Guide
- Access to On Line Examination
- Green Belt Certification based on successful completion of the examination.

Note that this exam is in addition to the normal HETAC accredited end of semester exams which are held by IT Sligo.

Academic Qualification - Courses HETAC Accredited

The Six Sigma modules are HETAC accredited at Level 7 at 5 credits each. This means that a student can study for an online degree program which is both nationally and internationally recognised. The on-line student sits the same exam as the full time student and is awarded the same qualification.

Further Study Options

As IT Sligo already offer online programs from Levels 7 -9 on the National Qualifications Framework (NQF), there will be a progression path for those students who pass the modules and wish to continue on with a degree in Quality or Manufacturing Management. Students who meet the eligibility criteria to enter the full degree programme can therefore upgrade skills in specific areas while still earning credits towards a final degree award. On successful completion of the three Six Sigma modules, the student will receive 15 credits at Level 7.

Module Syllabi

The following is a detailed syllabus of each module on the Six Sigma Green Belt Course

Module Title	Six Sigma I – Introduction and Quality Tools
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Indicative Syllabus

Quantitative Tools – Incl. The Seven Tools of Quality:

Histograms: How to prepare and use a Histogram. Mean, Mode, Median. Meaning of variation.
 Cause and Effect Diagrams : Making CE diagrams. How to use CE diagrams.
 Check Sheets : Function of check sheets. Types and uses of check sheets.
 Graphs : Types of graphs. How to make and use graphs.
 Pareto Analysis : How to make and use a Pareto diagram. Inclusion of cost on y-axis.
 Scatter Diagrams :How to make and use a scatter diagram. The meaning of correlation
 Boxplots : How to make and use boxplots. Comparing batches of data using boxplots.
 Stem-and-Leaf Displays :How to make and use stem-and-leaf displays to see patterns in data.

Qualitative Tools:

Brainstorming and Nominal Group Technique.
 Affinity diagram – gathering and grouping ideas
 Interrelationship Diagrams – looking for drivers and outcomes
 Radar Chart – rating organisation performance
 Force Field Analysis – positives and negatives of change
 Tree Diagram – Mapping the tasks for implementation
 Prioritisation matrices – weighing options

Control charts:

\bar{X} and R variable control chart. Attribute control charts i.e. p , np , c and u charts. Rules for identifying whether the process has gone out of control.

Process Capability:

Meaning of C_p and C_{pk} . How to calculate capability indices using both the \bar{X} and R method and also probability plots.

Six Sigma Concepts

Overview of Six Sigma, Key concepts of Six Sigma. The Six Sigma Methodology – DMAIC. The ± 1.5 Sigma Drift.

Mandatory Green Belt Textbook

Authors	Title	Publishers	Year
Paul A. Keller, Thomas Pyzdek	<i>Six Sigma Demystified</i> 450 pages ISBN:0071445447	McGraw-Hill Professional	2004

Module Title	Six Sigma II - Applied Statistical Control
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Indicative Syllabus

Six Sigma Analyse Phase

- Regression Analysis
- Scatter Diagrams.
- Linear Model.
- Interpreting the ANOVA Table.
- Confidence & Prediction Limits.
- Residuals Analysis.
- Overview of Multiple Regression Tools

Design of Experiments

- OE vs. Traditional Experiments & Data Mining

Control Charts:

Detailed interpretation of control chart patterns. Introduction to average run length and setting of sampling periods.

Median and Range chart, \bar{x} and s chart, charts of moving averages, short run SPC, charts for individual measurements. Use of statistical software to chart data.

Implementation of an SPC program. SPC implementation case studies. Selection of most appropriate control charting technique based on an analysis of the economic and practical difficulties.

Sampling

Principles of Acceptance sampling. Single sampling plans and their associated OC curves. Use of statistical tables to develop both the sampling plan and the OC curve.

Sampling methods. Practical difficulties of obtaining random samples of discrete materials. Introduction to bulk sampling. (6 Hours)

Selection and use of sampling plans from ANSI/ASQC Z1.4. Introduction to sampling by variables using ANSI/ASQC Z1.9. (14 Hours)

Indicative Practicals/Projects

- Entering data into Minitab. Copying and pasting from and to Excel
- Plotting and editing graphs in Minitab
- Generating reports with Minitab.
- Use of Minitab to plot data eg. Scatter diagrams, Histograms
- Use of Minitab to plot \bar{x} and R Control chart data
- Plotting attribute Control charts with Minitab

Module Title	Six Sigma III – Work Based Project
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Subject Aims:

The work-based project aims to provide students with the opportunity to apply and integrate the Six Sigma skills and knowledge they have gained on the program. The project(s) will be undertaken by the student and should address a substantive issue in the workplace. The project(s) will test the student’s ability to define a real-life problem of concern to the organisation, design a strategy for addressing the problem (DMAIC), gather data, formulate and evaluate options and make recommendations. While it is recommended that the problem is addressed as part of a cross-functional team, it is important that the student makes a significant contribution to the success of the project. Students will be given the opportunity to reflect on the strengths and weaknesses of their own leadership and communication skills, and those of the organisation with recommendations for change identified.

Syllabus Content

Six Sigma Green Belt

The student should bring the learning from the subjects covered in the course to conceive, define and agree a project which is work based and relevant to the subject matter. A mentor will be assigned to each project, which may be individual or group projects.

The mentor will act as a guide in agreeing the relevance, and scope of the project, and monitor the progress on a regular basis. Updates will be sent to the mentor on an agreed basis.

There will be an interim and final presentation on the project to which marks will be awarded.