IIW Guideline
INTERNATIONAL WELDED STRUCTURES DESIGNER

Minimum Requirements for the Education, Training, Examination and Qualification



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MINIMUM REQUIREMENTS FOR THE EDUCATION, TRAINING, EXAMINATION AND QUALIFICATION

INTERNATIONAL WELDED STRUCTURES DESIGNER

Prepared and issued by the IAB-International Authorisation Board
Under the authority of the IIW-International Institute of Welding

This is a reduced version; it is not the full Guideline

For more information regarding the Qualification System, the IAB/EWF Combined Secretariat or the National ANB should be contacted

(see in the IIW site the ANB contacts)

Published by: **EWF-IAB/IIW Secretariat**
Av. Prof. Dr. Cavaco Silva, 33
Taguspark – Apartado 012
P-2741-901 Porto Salvo
Portugal
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Tel: +351.21 4211351
Fax: +351.21 4228122
E-mail: ewf-iab@isq.pt
www.iiw-iis.org
www.ewf.be

Table of Contents

Page
1. **Introduction**..... 3
1.1 Guideline structure.....3
1.2 General access conditions.....3
2. **Course content overview: Theoretical and practical education**.....5
3. **Course syllabus**..... 6
Module 1: Welding Technology..... 6
Module 2: Strength of Materials..... 6
Module 3: Design of Welded Structures..... 6
Module 4: Design of Welded Joints..... 6
Module 5: Design of Welded Plate Structures..... 7
Module 6: Design for Purpose of Welded Structures..... 7
Module 7: Fabrication, Costs, Quality and Inspection..... 7

1. Introduction

This guideline for the international education, training, examination and qualification has been prepared by Group A "Education, Training and Qualification" of the International Authorisation Board (IAB) of the International Institute of Welding (IIW).

1.1 Guideline Structure

Chapter 2 provides an overview of the guideline content.

Chapter 3 of the guideline covers the minimum requirements for education and training. Students having successfully completed this course of education and the appropriate examinations (minimum 182 hours) will be expected to be capable of applying the technology required in Welded Structures Designer at the "Comprehensive" level (IWSD-C) as covered by this guideline. Students having successfully completed modules 1, 2, 3, and 7 of this course and the appropriate examinations (minimum 104 hours) will be expected to be capable of applying the technology required in Welded Structures Designer at the "Standard" level (IWSD-S) as covered by this guideline.

The contents are given in the following structure:	Hours in comprehensive level	Hours in standard level
Module 1: Welding technology	25	25
Module 2: Strength of materials	25	25
Module 3: Design of welded structures	25	25
Module 4: Design of welded joints	25	
Module 5: Design of welded plate structures	25	
Module 6: Design for purpose of welded structures	25	
Module 7: Fabrication, costs, quality and inspection	25	25
Examinations	7	4
Total	182	104

A "teaching hour" shall contain at least 50 minutes of direct teaching. It is not obligatory to follow exactly the order of the topics given in this guideline and choice in the arrangement of the syllabus is permitted. The dept to which each topic is dealt with is indicated by the number of hours allocated to it in the guideline.

It is to be noted that the overall structure of the syllabus for comprehensive and standard levels is similar, however some items are not considered appropriate in the education of the IWSD-S candidate. This will be reflected in the scope and depth of the examination.

Chapter 4 of the guideline covers the rules for examination and qualification.

1.2 General Access Conditions

In a separate document (Directory of Access Conditions, Doc. IAB-020-2000) the national definitions are given in detail.

Applicants entering for Welded Structures Designer at comprehensive level shall fulfil at least the National Access Conditions at the IWT level.

Applicants not fulfilling the entry access conditions at comprehensive level may follow the course, but are not allowed entry to the IIW examination at comprehensive level.

Applicants entering for Welded Structures Designer at the Standard level shall fulfil at least the National Access Conditions at the IWS level.

Note: While the minimum entrance requirements for the Standard level are equivalent to those for the IWS and for the comprehensive level are equal to those of IWT, some of the mathematical concepts presented in modules 3-6 will be very difficult for individuals with limited or no post-secondary mathematics training. It is therefore recommended that individuals entering the Standard level course should have mathematics background equivalent to those for the IWT. Similarly, individuals entering the Comprehensive level course should have entrance requirements equivalent to IWE. Alternatively, the individual should have at least one year of polytechnic level mathematics.

Applicants not fulfilling the entry access conditions at standard level may follow the course, but are not allowed entry to the IIW examination at Standard level.

In the case that a participant has an IWE, IWT or IWS diploma, the participant can get a release of attendance in modules 1 and 7, however she/he must complete the examinations (refer to diagram 1).

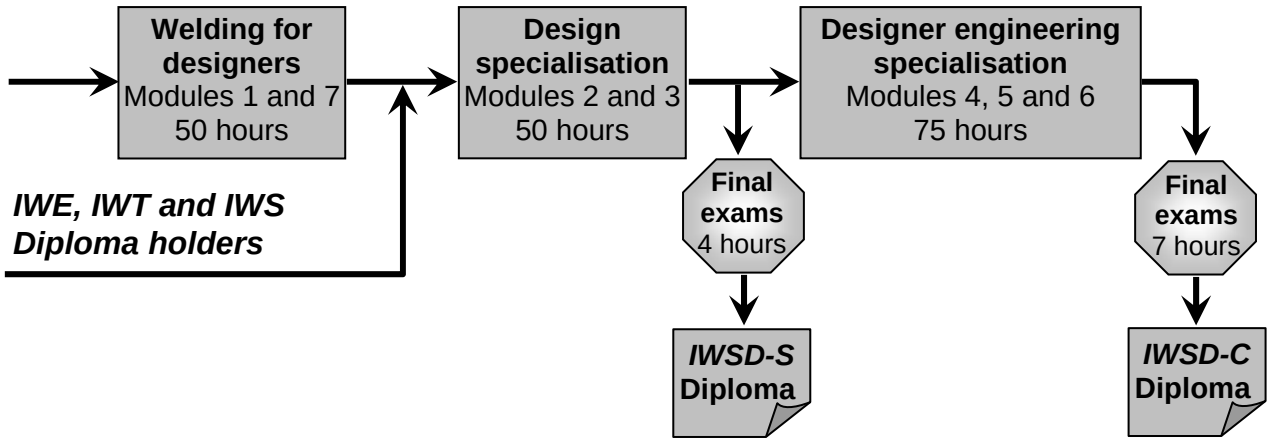


Diagram 1.

2 Course content overview: Theoretical and Practical Education

	Hours
Module 1: WELDING TECHNOLOGY	**25**
Module 2: STRENGTH OF MATERIALS	**25**
Module 3: DESIGN OF WELDED STRUCTURES	**25**
Module 4: DESIGN OF WELDED JOINTS (for **IWSD-C** level only)	**25**
Module 5: DESIGN OF WELDED PLATE STRUCTURES (for **IWSD-C** level only)	**25**
Module 6: DESIGN FOR PURPOSE OF WELDED STRUCTURES (for **IWSD-C** level only)	**25**
Module 7: FABRICATION, COSTS, QUALITY AND INSPECTION	**25**
Examinations: standard level	**4**
Examinations: comprehensive level	**7**
Total hours standard level	**104**
Total hours comprehensive level	**182**

3. Course Syllabus

Module 1: Welding Technology (25 hrs; for both comprehensive and standard levels)

M1.1 Welding terminology (3 hrs)

M1.2 Welding symbols and design drawings (3 hrs)

M1.3 Overview of welding processes (9 hrs)

M1.4 Materials and weld metallurgy (10 hrs)

Module 2: Strength of Materials (25 hrs; for both Comprehensive and Standard levels)

M2.1 Static equilibrium (3 hrs)

M2.2 Stress, strain and deformation (3 hrs)

M2.3 Failure criteria for structures and structural materials (4 hrs)

M2.4 Introduction to fatigue (6 hrs)

M2.5 Introduction to fracture mechanics (5 hrs)

M2.6 Material properties (4 hrs)

Module 3: Design of Welded Structures (25 hrs; for both comprehensive and standard levels)

M3.1 Basic theory of structural systems (4 hrs)

M3.2 Loads on structures (4 hrs)

M3.3 Introduction to the design of structures (8 hrs)

M3.4 Analysis methods for structures (5 hrs)

M3.5 Design guidance documents, codes and standards (4 hrs)

Module 4: Design of Welded Joints (25 hrs; for comprehensive level only)

M4.1 Categories of welded joints (4 hrs)

M4.2 Design of welded joints with predominantly static loading (8 hrs)

M4.3 Design of welded joints with predominantly dynamic/cyclic loading (10 hrs)

M4.4 Design against brittle fracture (3 hrs)

Module 5: Design of Welded Plate Structures (25 hrs; for comprehensive level only)

M5.1 Plates and shells (8 hrs)

M5.2 Beam and column structures (8 hrs)

M5.3 Design considerations for welding residual stresses and distortion (9 hrs)

Module 6: Design for Purpose of Welded Structures (25 hrs; for comprehensive level only)

M6.1 Introduction to design for purpose concepts for welded structures (3 hrs)

M6.2 Improved design of statically loaded joints (2 hrs)

M6.3 Improved design of dynamically/cycllic loaded joints (8 hrs)

M6.4 Post- weld treatment methods for welded structures (4 hrs)

M6.5 Design considerations for manual and automated welding processes (2,5 hrs)

M6.6 Numerical methods and fatigue design (4 hrs)

M6.7 Laboratory testing (1,5 hrs)

Module 7: Fabrication, Costs, Quality and Inspection (25 hrs; for both comprehensive and standard levels)

M7.1 Fabrication costs and cost reduction (8 hrs)

M7.2 Fabrication friendly design (10 hrs)

M7.3 Quality assurance in welding fabrication (4 hrs)

M7.4 Inspection methods and criteria (3 hrs)