The Further Education and Training Awards Council (FETAC) was set up as a statutory body on 11 June 2001 by the Minister for Education and Science. Under the Qualifications (Education & Training) Act, 1999, FETAC now has responsibility for making awards previously made by NCVA.

Module Descriptor

Industrial Hydraulic Systems

Level 6  L31111

www.fetac.ie
# Level 6 Module Descriptor

## Summary of Contents

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<th>Description</th>
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<tr>
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<td>Describes how the module functions as part of the national vocational certificate framework.</td>
</tr>
<tr>
<td>Module Title</td>
<td>Indicates the module content. This title appears on the learner’s certificate. It can be used to download the module from the website <a href="http://www.fetac.ie">www.fetac.ie</a>.</td>
</tr>
<tr>
<td>Module Code</td>
<td>An individual code is assigned to each module; a letter at the beginning denotes a vocational or general studies area under which the module is grouped and the first digit denotes its level within the national vocational certificate framework.</td>
</tr>
<tr>
<td>Level</td>
<td>Indicates where the module is placed in the national vocational certificate framework, from Level 3 to Level 6.</td>
</tr>
<tr>
<td>Credit Value</td>
<td>Denotes the amount of credit that a learner accumulates on achievement of the module.</td>
</tr>
<tr>
<td>Purpose</td>
<td>Describes in summary what the learner will achieve on successfully completing the module and in what learning and vocational contexts the module has been developed. Where relevant, it lists what certification will be awarded by other certification agencies.</td>
</tr>
<tr>
<td>Preferred Entry Level</td>
<td>Recommends the level of previous achievement or experience of the learner.</td>
</tr>
<tr>
<td>Special Requirements</td>
<td>Usually ‘none’ but in some cases detail is provided here of specific learner or course provider requirements. There may also be reference to the minimum safety or skill requirements that learners must achieve prior to assessment.</td>
</tr>
<tr>
<td>General Aims</td>
<td>Describe in 3-5 statements the broad skills and knowledge learners will have achieved on successful completion of the module.</td>
</tr>
<tr>
<td>Units</td>
<td>Structure the learning outcomes; there may be no units.</td>
</tr>
<tr>
<td>Specific Learning Outcomes</td>
<td>Describe in specific terms the knowledge and skills that learners will have achieved on successful completion of the module.</td>
</tr>
<tr>
<td>Portfolio of Assessment</td>
<td>Provides details on how the learning outcomes are to be assessed.</td>
</tr>
<tr>
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<td>Provides details of the grading system used.</td>
</tr>
<tr>
<td>Individual Candidate Marking Sheets</td>
<td>List the assessment criteria for each assessment technique and the marking system.</td>
</tr>
<tr>
<td>Module Results Summary Sheet</td>
<td>Records the marks for each candidate in each assessment technique and in total. It is an important record for centres of their candidate’s achievements.</td>
</tr>
<tr>
<td>Appendices</td>
<td>Can include approval forms for national governing bodies.</td>
</tr>
<tr>
<td>Glossary of Assessment Techniques</td>
<td>Explains the types of assessment techniques used to assess standards.</td>
</tr>
<tr>
<td>Assessment Principles</td>
<td>Describes the assessment principles that underpin FETAC approach to assessment.</td>
</tr>
</tbody>
</table>
Introduction

A module is a statement of the standards to be achieved to gain a FETAC award. Candidates are assessed to establish whether they have achieved the required standards. Credit is awarded for each module successfully completed.

The standards in a module are expressed principally in terms of specific learning outcomes, i.e. what the learner will be able to do on successful completion of the module. The other elements of the module - the purpose, general aims, assessment details and assessment criteria - combine with the learning outcomes to state the standards in a holistic way.

While FETAC is responsible for setting the standards for certification in partnership with course providers and industry, it is the course providers who are responsible for the design of the learning programmes. The duration, content and delivery of learning programmes should be appropriate to the learners’ needs and interests, and should enable the learners to reach the standard as described in the modules. Modules may be delivered alone or integrated with other modules.

The development of learners’ core skills is a key objective of vocational education and training. The opportunity to develop these skills may arise through a single module or a range of modules. The core skills include:

- taking initiative
- taking responsibility for one’s own learning and progress
- problem solving
- applying theoretical knowledge in practical contexts
- being numerate and literate
- having information and communication technology skills
- sourcing and organising information effectively
- listening effectively
- communicating orally and in writing
- working effectively in group situations
- understanding health and safety issues
- reflecting on and evaluating quality of own learning and achievement.

Course providers are encouraged to design programmes which enable learners to develop core skills.
Module Title: Industrial Hydraulic Systems

Module Code: L31111

Level: 6

Credit Value: 1 credit

Purpose:
This module is a statement of the standards to be achieved to gain a FETAC credit in Industrial Hydraulics at Level 6. The module is designed to extend the range skills of maintenance personnel to include basic competence in Industrial and Mobile Hydraulic Systems. It will also prepare them for specific training on advanced Hydraulic Systems.

Preferred Entry Level:
Level 5 Certificate, Leaving Certificate or equivalent qualifications and/or relevant life and work experiences.

Special Requirements:
None.

General Aims:
Learners who successfully complete this module will:

8.1 Understand the principles of operation of oil-hydraulic components and systems
8.2 Be capable of assembling hydraulic circuits from circuit diagrams
8.3 Be familiar with good maintenance practice for Industrial and Mobile Hydraulic Systems
8.4 Be able to apply this knowledge to fault finding in Hydraulic systems

Units:
The specific learning outcomes are grouped into 5 units.

Unit 1: Principles of Hydraulics
Unit 2: Operation and Construction of Hydraulic Components
Unit 3: Hydraulic Symbols and Circuit Reading
Unit 4: Good Maintenance Practice
Unit 5: Fault Finding
10 **Specific Learning Outcomes**

**Unit 1 Principles of Hydraulics**

*Learners should be able to:*

10.1.1 Identify many common applications of hydraulics
10.1.2 Understand the different requirements of industrial and mobile hydraulic systems
10.1.3 Explain the operation of all types of hydraulic cylinders
10.1.4 Explain the connection between load, pressure and component size
10.1.5 Explain the connection between flow rate and component speed
10.1.6 Select a suitable piston size for an application

**Unit 2 Construction and Operation of Hydraulic Components**

*Learners should be able to:*

10.2.1 Explain the function of a hydraulic pump
10.2.2 Distinguish between hydraulic pumps and motors
10.2.3 Explain the operation of the three basic types of hydraulic valves
10.2.4 State how flow control is achieved in hydraulic circuits
10.2.5 Distinguish between various types of valves
10.2.6 Select a suitable pump size for an application
10.2.7 Recognise the effects of internal leakage

**Unit 3 Hydraulic Symbols & Circuits**

*Learners should be able to:*

10.3.1 Recognise the symbols for all common hydraulic components
10.3.2 Select hardware components by means of their symbols
10.3.3 Explain the function of common hydraulic components from their symbols
10.3.4 Construct hydraulic systems from circuits using standard symbols
10.3.5 Select suitable settings for basic pressure and flow control valves
10.3.6 Use a simple hydraulic system
10.3.7 Select the correct symbols for a hardware system
10.3.8 Design a hydraulic circuit for a basic application
Unit 4  Good Maintenance Practice  
*Learners should be able to:*

10.4.1 List standard maintenance checks on hydraulic systems  
10.4.2 Interpret standard filtration and cleanliness ratings for oils  
10.4.3 Recognise the conditions that will cause oil deterioration  
10.4.4 Interpret pressure and temperature readings  
10.4.5 Identify potential dangers in hydraulic systems  
10.4.6 Demonstrate safe work practices for dealing with hydraulic machines  
10.4.7 Demonstrate good work practice in assembly/disassembly of components  

Unit 5  Fault Finding  
*Learners should be able to:*

10.5.1 Distinguish between normal and abnormal running conditions  
10.5.2 Analyse a fault condition  
10.5.3 Distinguish between an incorrect setting and a faulty component  
10.5.4 Identify a faulty component  
10.5.5 recognise broken components  

11 Portfolio of Assessment  

<table>
<thead>
<tr>
<th>Summary</th>
<th>Examinations (2)</th>
<th>40%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Skills Demonstration</td>
<td>60%</td>
</tr>
</tbody>
</table>
11.1 Examinations

The internal assessor will devise a brief theory-based examinations that assess candidates’ ability to recall and apply theory and understanding, requiring responses to a range of s/a questions.

These examinations will be based on Units 1 and 2.

The examinations will be 1 hour in duration.

*The format of each of the examinations will be as follows:*

<table>
<thead>
<tr>
<th>Percentage range</th>
<th>Time Allocated</th>
<th>No. of Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>1 hour</td>
<td>10</td>
</tr>
</tbody>
</table>

11.2 Skills Demonstrations

In one or more skills demonstrations, candidates will be assessed in a broad range of practical skills (and knowledge) as outlined in Units 3, 4 and 5.

*The format of each of the examinations will be as follows:*

<table>
<thead>
<tr>
<th>Percentage range</th>
<th>Time Allocated</th>
<th>No. of Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>45 minutes</td>
<td>1</td>
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</tbody>
</table>

12 Grading

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass</td>
<td>50 - 64%</td>
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<tr>
<td>Merit</td>
<td>65 - 79%</td>
</tr>
<tr>
<td>Distinction</td>
<td>80 - 100%</td>
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<tr>
<td>Assessment Criteria</td>
<td>Maximum Mark</td>
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</table>

**TOTAL MARKS**

This mark should be transferred to the Module Results Summary Sheet

20

*Internal Assessor’s Signature: ____________________________ Date: ____________*

*External Authenticator’s Signature: ________________________ Date: ____________*
<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Maximum Mark</th>
<th>Candidate Mark</th>
</tr>
</thead>
</table>

TOTAL MARKS
This mark should be transferred to the Module Results Summary Sheet 20

Internal Assessor’s Signature: ____________________________ Date: ______

External Authenticator’s Signature: ______________________ Date: ______
Candidate Name: ______________________________  PPSN: ________________________
Centre: __________________________________________________  Centre No.: _________

<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Maximum Mark</th>
<th>Candidate Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills Demonstration 1</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Skills Demonstration 2</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Skills Demonstration 3</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL MARKS**
This mark should be transferred to the Module Results Summary Sheet 60

*Internal Assessor’s Signature:* ______________________________  *Date:* __________

*External Authenticator’s Signature:* ______________________________  *Date:* __________
# FETAC Module Results Summary Sheet

**Module Title:** Industrial Hydraulics  
**Module Code:** L31111

<table>
<thead>
<tr>
<th>Candidate Surname</th>
<th>Candidate Forename</th>
<th>Total 100%</th>
<th>Grade*</th>
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<tbody>
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</table>

Signed:  
**Internal Assessor:** ______________________ **Date:** __________

This sheet is for internal assessors to record the overall marks of individual candidates. It should be retained in the centre. The marks awarded should be transferred to the official FETAC Module Results Sheet issued to centres before the visit of the external Authenticator.

Grade*  
D: 80 - 100%  
M: 65 - 79%  
P: 50 - 64%  
U: 0 - 49%  
W: candidates entered who did not present for assessment
# FETAC Module Results Summary Sheet

**Module Title:** Industrial Hydraulics  
**Module Code:** L31111

<table>
<thead>
<tr>
<th>Candidate Surname</th>
<th>Candidate Forename</th>
<th>Mark Sheet 1 (40)</th>
<th>Mark Sheet 2 (60)</th>
<th>Total 100%</th>
<th>Grade*</th>
</tr>
</thead>
<tbody>
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</table>

**Signed:**  
**Internal Assessor:** ___________________________  
**Date:** ___________________________

This sheet is for internal assessors to record the overall marks of individual candidates. It should be retained in the centre. The marks awarded should be transferred to the official FETAC Module Results Sheet issued to centres before the visit of the external Authenticator.

Grade*  
D: 80 - 100%  
M: 65 - 79%  
P: 50 - 64%  
U: 0 - 49%  
W: candidates entered who did not present for assessment
Glossary of Assessment Techniques

Assignment

An exercise carried out in response to a brief with specific guidelines and usually of short duration.

Each assignment is based on a brief provided by the internal assessor. The brief includes specific guidelines for candidates. The assignment is carried out over a period of time specified by the internal assessor.

Assignments may be specified as an oral presentation, case study, observations, or have a detailed title such as audition piece, health fitness plan or vocational area profile.

Collection of Work

A collection and/or selection of pieces of work produced by candidates over a period of time that demonstrates the mastery of skills.

Using guidelines provided by the internal assessor, candidates compile a collection of their own work. The collection of work demonstrates evidence of a range of specific learning outcomes or skills. The evidence may be produced in a range of conditions, such as in the learning environment, in a role play exercise, or in real-life/work situations.

This body of work may be self-generated rather than carried out in response to a specific assignment e.g. art work, engineering work etc.

Examination

A means of assessing a candidate’s ability to recall and apply skills, knowledge and understanding within a set period of time (time constrained) and under clearly specified conditions.

Examinations may be:

- practical, assessing the mastery of specified practical skills demonstrated in a set period of time under restricted conditions
- oral, testing ability to speak effectively in the vernacular or other languages
- interview-style, assessing learning through verbal questioning, on one-to-one/group basis
- aural, testing listening and interpretation skills
- theory-based, assessing the candidate’s ability to recall and apply theory, requiring responses to a range of question types, such as objective, short answer, structured, essay. These questions may be answered in different media such as in writing, orally etc.

Learner Record

A self-reported record by an individual, in which he/she describes specific learning experiences, activities, responses, skills acquired.

Candidates compile a personal logbook/journal/diary/daily diary/record/laboratory notebook/sketch book.

The logbook/journal/diary/daily diary/record/laboratory notebook/sketch book should cover specified aspects of the learner’s experience.
**Project**

*A substantial individual or group response to a brief with guidelines, usually carried out over a period of time.*

Projects may involve:

- research – requiring individual/group investigation of a topic
- process – e.g. design, performance, production of an artefact/event

Projects will be based on a brief provided by the internal assessor or negotiated by the candidate with the internal assessor. The brief will include broad guidelines for the candidate. The work will be carried out over a specified period of time.

Projects may be undertaken as a group or collaborative project; however the individual contribution of each candidate must be clearly identified.

The project will enable the candidate to demonstrate: *(some of these – about 2-4)*

- understanding and application of concepts in (specify area)
- use/selection of relevant research/survey techniques, sources of information, referencing, bibliography
- ability to analyse, evaluate, draw conclusions, make recommendations
- understanding of process/planning implementation and review skills/planning and time management skills
- ability to implement/produce/make/construct/perform
- mastery of tools and techniques
- design/creativity/problem-solving/evaluation skills
- presentation/display skills
- team working/co-operation/participation skills.

**Skills Demonstration**

*Assessment of mastery of specified practical, organisational and/or interpersonal skills.*

These skills are assessed at any time throughout the learning process by the internal assessor/another qualified person in the centre for whom the candidate undertakes relevant tasks.

The skills may be demonstrated in a range of conditions, such as in the learning environment, in a role-play exercise, or in a real-life/work situation.

The candidate may submit a written report/supporting documentation as part of the assessment.

Examples of skills: laboratory skills, computer skills, coaching skills, interpersonal skills.
FETAC Assessment Principles

1. Assessment is regarded as an integral part of the learning process.

2. All FETAC assessment is criterion referenced. Each assessment technique has **assessment criteria** which detail the range of marks to be awarded for specific standards of knowledge, skills and competence demonstrated by candidates.

3. The mode of assessment is generally local i.e. the assessment techniques are devised and implemented by internal assessors in centres.

4. Assessment techniques in FETAC modules are valid in that they test a range of appropriate learning outcomes.

5. The reliability of assessment techniques is facilitated by providing support for assessors.

6. Arising from an extensive consultation process, each FETAC module describes what is considered to be an optimum approach to assessment. When the necessary procedures are in place, it will be possible for assessors to use other forms of assessment, provided they are demonstrated to be valid and reliable.

7. To enable all learners to demonstrate that they have reached the required standard, candidate evidence may be submitted in written, oral, visual, multimedia or other format as appropriate to the learning outcomes.

8. Assessment of a number of modules may be integrated, provided the separate criteria for each module are met.

9. Group or team work may form part of the assessment of a module, provided each candidate’s achievement is separately assessed.