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

Client Server Networks

Level 6 C30258

www.fetac.ie
# Level 6 Module Descriptor

## Summary of Contents

<table>
<thead>
<tr>
<th><strong>Introduction</strong></th>
<th>Describes how the module functions as part of the national vocational certificate framework.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module Title</strong></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><strong>Module Code</strong></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><strong>Level</strong></td>
<td>Indicates where the module is placed in the national vocational certificate framework, from Level 3 to Level 6.</td>
</tr>
<tr>
<td><strong>Credit Value</strong></td>
<td>Denotes the amount of credit that a learner accumulates on achievement of the module.</td>
</tr>
<tr>
<td><strong>Purpose</strong></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><strong>Preferred Entry Level</strong></td>
<td>Recommends the level of previous achievement or experience of the learner.</td>
</tr>
<tr>
<td><strong>Special Requirements</strong></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><strong>General Aims</strong></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><strong>Units</strong></td>
<td>Structure the learning outcomes; there may be no units.</td>
</tr>
<tr>
<td><strong>Specific Learning Outcomes</strong></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><strong>Portfolio of Assessment</strong></td>
<td>Provides details on how the learning outcomes are to be assessed.</td>
</tr>
<tr>
<td><strong>Grading</strong></td>
<td>Provides details of the grading system used.</td>
</tr>
<tr>
<td><strong>Individual Candidate Marking Sheets</strong></td>
<td>List the assessment criteria for each assessment technique and the marking system.</td>
</tr>
<tr>
<td><strong>Module Results Summary Sheet</strong></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><strong>Appendices</strong></td>
<td>Can include approval forms for national governing bodies.</td>
</tr>
<tr>
<td><strong>Glossary of Assessment Techniques</strong></td>
<td>Explains the types of assessment techniques used to assess standards.</td>
</tr>
<tr>
<td><strong>Assessment Principles</strong></td>
<td>Describes the assessment principles that underpin the 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 the 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.
1. Module Title: Client Server Networks

2. Module Code: C30258

3. Level: 6

4. Credit Value: 1 credit

5. Purpose: This module is a statement of the standards to be achieved to gain a FETAC credit in Client Server Networks at level 6. It is designed to provide a solid Level 3 for the student in the fundamentals understanding and creating different client server networks.

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

7. Special Requirements: None

8. General Aims: This module aims to enable the learner to:

8.1 Understand and distinguish different types of network servers
8.2 Understand different types of wired connectivity
8.3 Know the benefits and limitations of different types of wired connectivity.
8.4 Know the benefits and limitations of wireless networks.
8.5 Identify hardware found in a computer server room know how they function.
8.6 Install and upgrade server operating systems and utility software.
8.7 Configure servers to perform a number of functions including RIS, DHCP, DNS as well as primary and secondary server controllers
8.8 Roll out operating systems onto a network automatically.
8.9 Add clients with different operating systems to a network.
8.10 Upgrade software automatically.
8.11 Monitor resources and diagnose problems on a client server network.
9. Units

The specific learning outcomes are grouped into 4 units.

Unit 1  Server Principles
Unit 2  Implementation of Physical Architecture
Unit 3  Installation an Configuration
Unit 4  Network maintenance and optimisation.
Unit 5  Planning and implementation

10 Specific Learning Outcomes

Unit 1  Server Principles

Learners should be able to:

10.1.1 Understand software licences; per user, device, site.
10.1.2 Know the main functions of the main types of servers including RIS, RAS, DHCP, mail, web, file, print, gateway, firewall and proxy.
10.1.3 Understand the principle of fault tolerance on a client server network.
10.1.4 Understand differences between RAID levels 0, 1, 5, and 0+1.
10.1.5 Understand the principle of using primary and backup servers to secure user access on a network.
10.1.6 Understand the importance of server room security.
10.1.7 Know the roles of patch panels, hubs and switches.
10.1.8 Know the importance of non-interruptible power supplies.
10.1.9 Understand the importance of expandability and upgrading of networks and networking hardware

Unit 2  Implementation of Physical Architecture

Learners should be able to:

10.2.1 Recognise different wired connectivity types e.g Thick Net, Thin Net, Twisted Pair and Fibre Optic.
10.2.2 Understand the structure and of different wired connectivity e.g Thick Net, Thin Net, Twisted Pair and Fibre Optic.
10.2.3 Know the benefits and limitations of wired connectivity types in relation to speed, volume, optimum distance, ease of installation and cost.
10.2.4 Know types of wireless networking standards e.g. radio (IEEE 802.11b Standard)
10.2.5 Recognise the types of connectors used for each type of what e.g. RJ45, BNC, AUI, and FDDI.

10.2.6 Know the functions of and recognise STP, UTP and Plenum grade twisted pair cable.

10.2.7 Recognise cable making equipment e.g. Crimpers, cable testers etc.

10.2.8 Demonstrate the ability to make a CAT 5 Thru cable.

10.2.9 Demonstrate the ability to make a CAT 5 Crossover cable.

10.2.10 Use a cable tester to diagnose cable difficulties.

10.2.11 Know the importance of numbering and organising cables.

10.2.12 Demonstrate the ability to plan a cable layout for a LAN using conduit, face plates, patch leads etc.

Unit 3 Installation and configuration

Learners should be able to:

10.3.1 Install and configure an operating system on a server from bootable CD Rom.

10.3.2 Configure primary and backup controllers to secure access on a network.

10.3.3 Configure hard disks for striped and/or mirrored storage.

10.3.4 Manually add a client computer so it can participate on a network.

10.3.5 Configure a client computer that uses a different operating system (e.g. Mac OS) so it can participate on a network.

10.3.6 Install an operating system on client computers using the network and a distribution server.

10.3.7 Configure a DNS server and enable forwarding for internet connections.

10.3.8 Configure a DHCP server to allow client computers obtain TCP/IP addresses.

10.3.9 Create a master disk image for client computers.

10.3.10 Create an “unattended” set up script.

10.3.11 Configure a server for remote installation.

10.3.12 Complete an unattended installation of client computers on a network.
10.3.13 Configure a server for printing using more than one printer
10.3.14 Configure a DNS Server

Unit 4  Maintenance and optimisation.  
*Learners should be able to:*

10.4.1 Set up anti-virus measures to protect the network.
10.4.2 Configure a firewall to increase security on the network.
10.4.3 Download and extract service packs to upgrade operating systems.
10.4.4 Configure servers and clients for automatic software updates.
10.4.5 Understand backup types e.g. Full, Partial, Incremental and Differential
10.4.6 Recognise different backup hardware such as QIC, DAT, DLT and AIT and know their speeds and capacities.
10.4.7 Plan and implement a strategy for backup and recovery of data. (e.g. Son, Father, Grandfather)
10.4.8 Use server diagnostic utility software to troubleshooting problems
10.4.9 Monitor resources including Memory, CPU and Hard disks usage.
10.4.10 Examine log files to help identify various network problems.
10.4.11 Optimise network performance in relation to Processors, Memory, Disks and network sub systems.
10.4.12 Troubleshoot and access basic network difficulties remotely.

Unit 5  Planning and implementation  
*Learners should be able to:*

10.5.1 Analyse the networking needs of a small to medium sized business in relation to:
   - Environment
   - Staff needs
   - Security
   - Expandability
   - Connectivity
10.5.2 Plan a cost effective network solution for a small to medium sized business taking into consideration environment, staff needs, security, expandability and connectivity.

10.5.3 Describe the process of implementation of the network solution described in 10.5.2

10.5.4 Describe the roles of staff in relation to maintenance and disaster recovery.

10.5.5 Critically evaluate the effectiveness of the network solution in 10.5.2, 10.5.3 and 10.5.4.
10 Portfolio of Assessment

Please refer to the glossary of assessment techniques and the note on assessment principles at the end of this module descriptor.

Summary

Skills Demonstration x 3  60%
Project 40%

11.2 Skills Demonstration

The internal assessor will devise a brief that requires candidates to produce evidence that demonstrates an understanding and application of a range of specific learning outcomes.

In 3 skills demonstrations, candidates will be assessed in a broad range of practical skills and adherence to safe working practices throughout.

Demonstration 1

Candidates will:

- Identify types of cable and corresponding connectors.
- Create a Cat 5 thru cable.
- Create a Cat 5 crossover cable.
- Complete visual check of RJ45 jack with connecting cable and identify problems if necessary.
- Using a cable tester, test both cables and troubleshoot if necessary.

Demonstration 2

- Install and configure an operating system on a server from bootable CD Rom or a distribution server.
- Configure primary and backup controllers to secure access on a network.
- Configure hard disks for striped and/or mirrored storage.
- Configure a client computer with a different O.S. so it can participate on a network.
- Configure a server for printing using more than one printer.
Demonstration 3

- Create a master disk image for client computers and an “unattended” setup script.
- Configure a server for remote installation and complete an “unattended” installation of client computers on a network. (*See note)
- Set up anti-virus measures to protect the network.
- Configure servers and clients for automatic software updates.
- Monitor resources including Memory, CPU and Hard disks usage and diagnose server/network problems.

*Note: The installation may be fully or partially unattended.

11.3 Project
The internal assessor will devise a project brief that allows the candidate to analyse and evaluate a client/server network in relation to the specific learning outcomes in Unit 5.

13 Grading

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass</td>
<td>50-64%</td>
</tr>
<tr>
<td>Merit</td>
<td>65-79%</td>
</tr>
<tr>
<td>Distinction</td>
<td>80-100%</td>
</tr>
<tr>
<td>Assessment Criteria</td>
<td>Maximum Mark</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>Skills Demonstration 1</strong></td>
<td></td>
</tr>
<tr>
<td>• Identify cable and corresponding connectors.</td>
<td></td>
</tr>
<tr>
<td>• Create a Cat 5 thru cable.</td>
<td></td>
</tr>
<tr>
<td>• Create a Cat 5 crossover cable.</td>
<td></td>
</tr>
<tr>
<td>• Visual check of cable and jack, problems corrected</td>
<td></td>
</tr>
<tr>
<td>• Cables tested . Problems identified and corrected</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>10</td>
</tr>
<tr>
<td><strong>Skills Demonstration 2</strong></td>
<td></td>
</tr>
<tr>
<td>• Operating system installed and configured on server.</td>
<td></td>
</tr>
<tr>
<td>• Primary and backup controllers configured to secure access on a network.</td>
<td></td>
</tr>
<tr>
<td>• Hard disks configured for striped / mirrored storage.</td>
<td></td>
</tr>
<tr>
<td>• Client computer configured with a different O.S. so it can participate on a network.</td>
<td></td>
</tr>
<tr>
<td>• Server configured for printing using more than one printer</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>25</td>
</tr>
<tr>
<td><strong>Skills Demonstration 3</strong></td>
<td></td>
</tr>
<tr>
<td>• Master disk image and an “unattended” set up script created for client computers.</td>
<td></td>
</tr>
<tr>
<td>• Server configured for remote installation and an “unattended” installation of computers on a network.</td>
<td></td>
</tr>
<tr>
<td>• Anti-virus measures set up to protect the network.</td>
<td></td>
</tr>
<tr>
<td>• Servers and clients configured for automatic software updates.</td>
<td></td>
</tr>
<tr>
<td>• Monitor resources including Memory, CPU, Hard disks usage and diagnose server/network problems.</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>25</td>
</tr>
<tr>
<td><strong>TOTAL MARKS</strong></td>
<td>60</td>
</tr>
</tbody>
</table>

This mark should be transferred to the Module Results Summary Sheet

*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>
<tbody>
<tr>
<td><strong>Appropriate Planning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analyse and Plan the networking needs of a small to medium sized business in relation to: Environment, Staff needs, Security, Expandability and Connectivity</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td><strong>Demonstrated Understanding</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Describe the process of implementation of the network solution described in the analysis and planning phase. Describe the roles of staff in relation to maintenance and disaster recovery.</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td><strong>Critical Evaluation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critically evaluate the effectiveness of the network solution.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td><strong>Conclusions and Recommendations</strong></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL MARKS</strong></td>
<td></td>
<td>40</td>
</tr>
</tbody>
</table>

*This mark should be transferred to the Module Results Summary sheet*

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

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

**Module Title:** Client Server Networks  
**Module Code:** C30258

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

**Maximum Marks per Marking Sheet**

<table>
<thead>
<tr>
<th>Mark Sheet 1</th>
<th>Mark Sheet 2</th>
<th>Total 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

**Grade***

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

---

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.

Signed: __________________________  

Internal Assessor: __________________________  

Date: __________________________  

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 eg 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/daily diary/daily diary/record/laboratory notebook/sketch book.

The logbook/journal/daily 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 – eg 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 situations.

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.