COGAN Competency Tracker version 1.7.2 User Manual

Anonymous user, registered user and group manager roles

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Introduction

The COGAN project

The COGAN Competency Tracker v. 1.7.2 is one of the deliverables of the COGAN "COmpetency in Geotechnical ANalysis" project, co-funded by the European Commission, Education and Culture DG, under the Lifelong Learning Programme “Leonardo da Vinci” Transfer of Innovation (contract UK/13/LLP-LdV/TOI-620).

More details on the project are available at the following address: http://www.cogan.eu.com

This project has been funded with support from the European Commission. The contribution of the European Commission is gratefully acknowledged.

This publication reflects the views only of the Author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Conventions used in this manual

A link or menu button is presented in underlined and italic font:	*link or menu button*
Sequence of links or menu buttons:	*link1* > *link2*
A definition is presented in bold font:	**definition**
Image captions are presented in italic:	*caption*
Cautionary notes are presented in bold red font:	**cautionary note**

Version of the framework

This manual refers to the COGAN Competency Tracker version 1.7.2. To identify the current version of the Competency Tracker please refer to the *about* section of the User menu (see further).

Contacting the COGAN Consortium

To get in contact with the COGAN Consortium please send an email to: *info@nafems.org*

The COGAN Educational Base and the COGAN Competency Tracker

The COGAN Educational Base

The COGAN Educational Base, one of the key deliverables for the COGAN project, is a database of competences and educational base, **specifically crafted for geotechnical analysts**, containing **competence statements** covering most of the whole spectrum of the geotechnical analysis and simulation competences. The competences can be used for educational purposes: most of the statements are linked to appropriate **educational resources**, such as books, articles, codes of practice, etc., that will help an engineer to gain the appropriate competence.

The main purpose of the COGAN educational base is to direct staff development in the geotechnical industry. In the following pages we will refer to the COGAN Educational Base simply as the Educational Base.

The COGAN competence statements are split down in to a number of different modules, covering different **technical areas**.

The Educational Base consists of competence statements in a range of technical areas including those listed below:

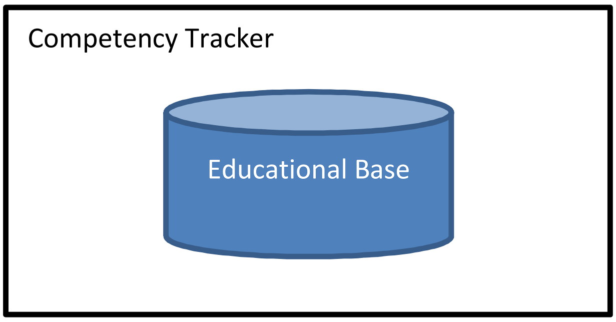
- DNM - Designing a numerical model for geotechnical analysis
- SEI - Structural elements and interfaces
- CMPSM - Constitutive models and parameters for structural materials
- CMG - Constitutive models for geomaterials
- SRP - Obtaining soil/rock parameters
- SUGF - Saturated/unsaturated groundwater flow
- DUA - Drained/undrained analysis
- CON - Consolidation
- VAL - Validation of analysis results
- DE - Deep excavations
- FOU - Foundations
- ES - Earthworks and slopes
- SM - Soil Mechanics
- RM - Rock Mechanics
- MADC - Modelling applications and design code considerations

The Competency Tracker

The *COGAN Competency Tracker* has been built around the Educational Base. The Competency Tracker is a computerized system that allows the skills that are developed by individuals to be tracked and logged. The Competency Tracker is available online via the Internet, and is based upon an online version of the Educational Base.

The Competency Tracker can be used by individuals to plan and monitor their career development as a simulation engineer, or by companies to do the same for their staff and to keep a database of the combined simulation skills of their workforce.

The Competency Tracker is designed as a flexible web based and intranet system integrated with the educational base, capable of being tailored for individuals, SMEs and large organizations as well. For the individual user, the Competency Tracker will help track learning progresses and guiding further learning. For organizations, it provides a highly customizable system capable of interfacing to existing staff development systems.



The Competency Tracker and Educational Base

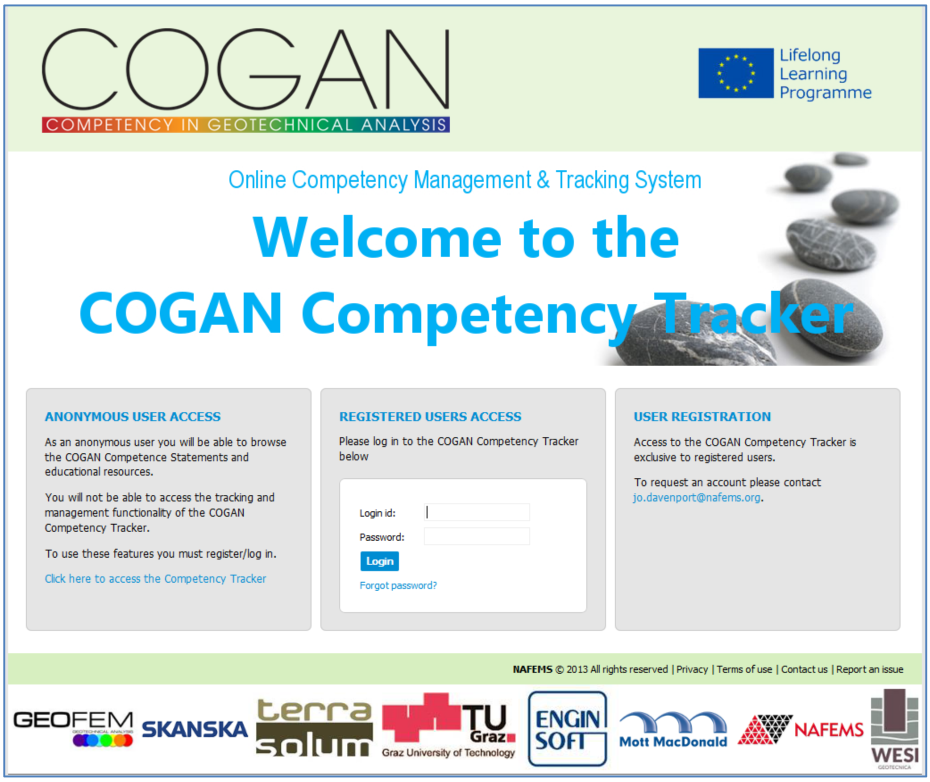
The Educational Base

First time access to the Educational Base

To access the online Educational Base **homepage** please visit the following address:

https://www.psecompetencytracker.org/cogan/

The Educational Base is available only through a secure http (HTTPS) connection. Depending on the browser in use, you should see a closed lock and should be able to find out the details of the security certificate that guarantees the security of your connection. In no event should the framework ask you to add a security exception to your browser. In case of doubts, please do not use the Competency Tracker and contact the COGAN Consortium.



COGAN
COMPETENCY IN GEOTECHNICAL ANALYSIS
Lifelong Learning Programme

Online Competency Management & Tracking System

Welcome to the COGAN Competency Tracker

ANONYMOUS USER ACCESS

As an anonymous user you will be able to browse the COGAN Competence Statements and educational resources.

You will not be able to access the tracking and management functionality of the COGAN Competency Tracker.

To use these features you must register/log in.

Click here to access the Competency Tracker

REGISTERED USERS ACCESS

Please log in to the COGAN Competency Tracker below

Login id:
Password:

Login
Forgot password?

USER REGISTRATION

Access to the COGAN Competency Tracker is exclusive to registered users.

To request an account please contact jo.davenport@nafems.org.

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GEOFEM
SKANSKA
terra solum
TU Graz
Graz University of Technology
ENGIN SOFT
Mott MacDonald
NAFEMS
WESI

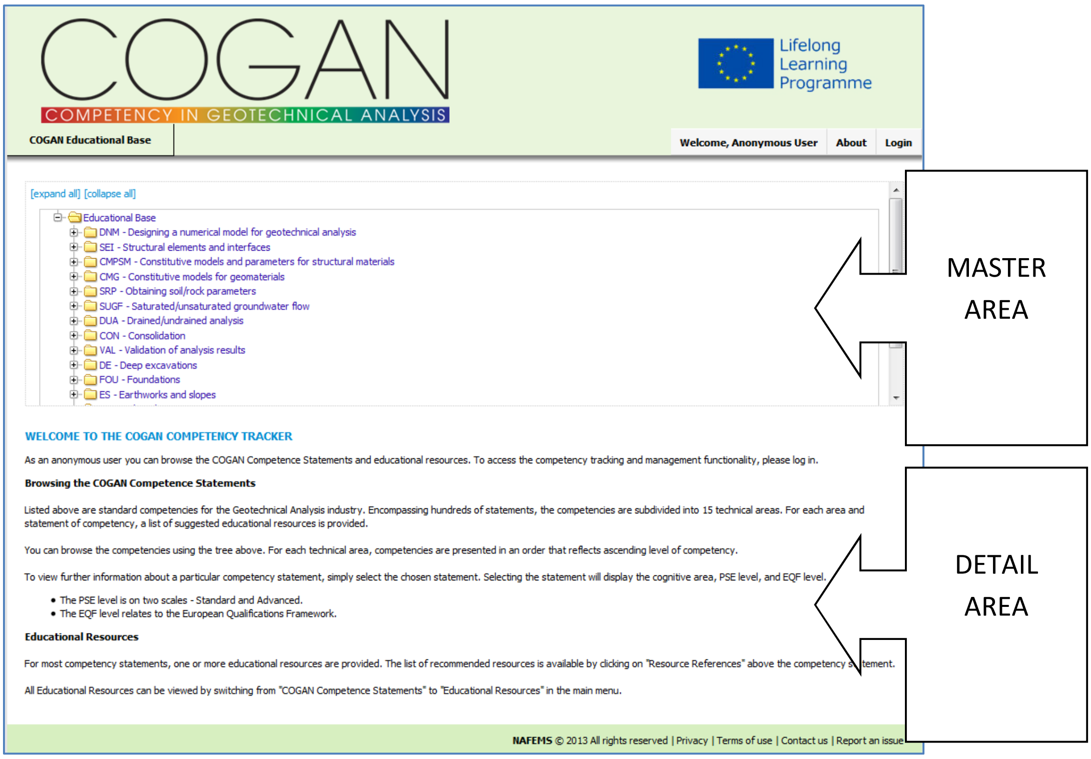
COGAN online Educational Base and Competency Tracker homepage

Navigating the educational base

A first visit as Anonymous User

It is possible to access the educational base without logging in. A link is provided in the left side of the homepage, inside the “anonymous user access” box.

The Competency Tracker user interface is designed using the “master-detail” approach. The **master–detail** interface displays on the same page a master area containing a set of items, and a detail area for the currently selected item. For example, the **master area** can show a list or tree of items, and the **detail area** can be a form or list of items placed below the master area. Selecting an item from the master area updates the details of that item in the detail area.


COGAN
COMPETENCY IN GEOTECHNICAL ANALYSIS
Lifelong Learning Programme
COGAN Educational Base
Welcome, Anonymous User
About
Login
[expand all] [collapse all]
Educational Base
DNM - Designing a numerical model for geotechnical analysis
SEI - Structural elements and interfaces
CMPSM - Constitutive models and parameters for structural materials
CMG - Constitutive models for geomaterials
SRP - Obtaining soil/rock parameters
SUGF - Saturated/unsaturated groundwater flow
DUA - Drained/undrained analysis
CON - Consolidation
VAL - Validation of analysis results
DE - Deep excavations
FOU - Foundations
ES - Earthworks and slopes
MASTER AREA
DETAIL AREA
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WELCOME TO THE COGAN COMPETENCY TRACKER

As an anonymous user you can browse the COGAN Competence Statements and educational resources. To access the competency tracking and management functionality, please log in.

Browsing the COGAN Competence Statements

Listed above are standard competencies for the Geotechnical Analysis industry. Encompassing hundreds of statements, the competencies are subdivided into 15 technical areas. For each area and statement of competency, a list of suggested educational resources is provided.

You can browse the competencies using the tree above. For each technical area, competencies are presented in an order that reflects ascending level of competency.

To view further information about a particular competency statement, simply select the chosen statement. Selecting the statement will display the cognitive area, PSE level, and EQF level.

- The PSE level is on two scales - Standard and Advanced.
- The EQF level relates to the European Qualifications Framework.

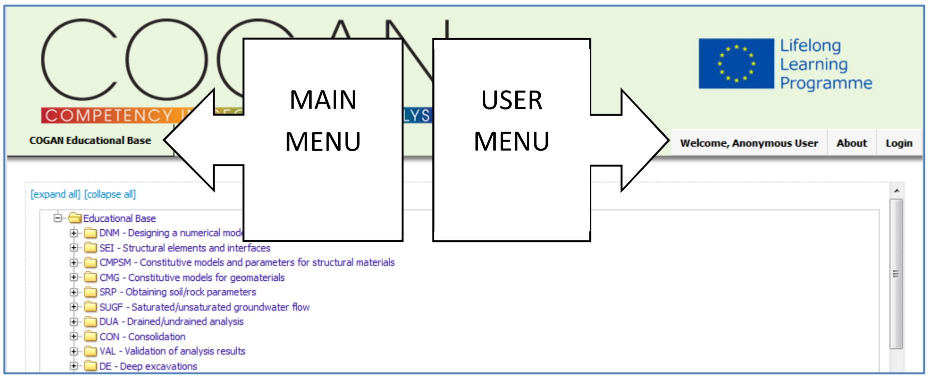
Educational Resources

For most competency statements, one or more educational resources are provided. The list of recommended resources is available by clicking on "Resource References" above the competency s tement.

All Educational Resources can be viewed by switching from "COGAN Competence Statements" to "Educational Resources" in the main menu.

“Master-detail” interface

In the upper part of the page two menus are available: the **main menu** and the **user menu**.


COGAN
COMPETENCY IN GEOTECHNICAL ANALYSIS
Lifelong Learning Programme
COGAN Educational Base
MAIN MENU
USER MENU
Welcome, Anonymous User
About
Login
[expand all] [collapse all]

Educational Base
DNM - Designing a numerical mod
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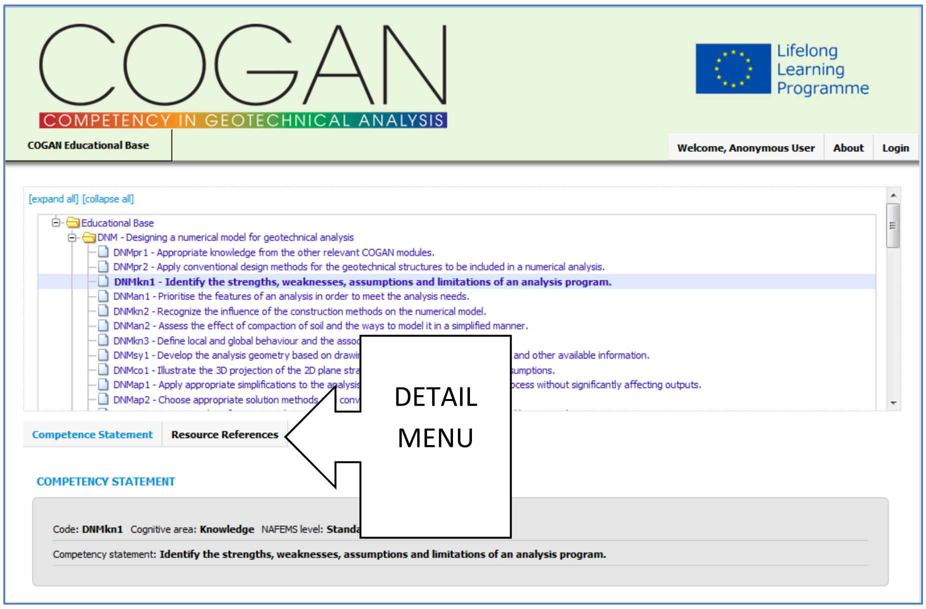
VAL - Validation of analysis results
DE - Deep excavations

Position of the main menu and user menu in the page

At the top of the detail area a **detail menu** is provided.


COGAN
COMPETENCY IN GEOTECHNICAL ANALYSIS
Lifelong Learning Programme
COGAN Educational Base
Welcome, Anonymous User
About
Login
[expand all] [collapse all]
DETAIL MENU
Competence Statement
Resource References

Educational Base
DNM - Designing a numerical model for geotechnical analysis
DNMpr1 - Appropriate knowledge from the other relevant COGAN modules.
DNMpr2 - Apply conventional design methods for the geotechnical structures to be included in a numerical analysis.
DNMkn1 - Identify the strengths, weaknesses, assumptions and limitations of an analysis program.
DNMan1 - Prioritise the features of an analysis in order to meet the analysis needs.
DNMkn2 - Recognize the influence of the construction methods on the numerical model.
DNMan2 - Assess the effect of compaction of soil and the ways to model it in a simplified manner.
DNMkn3 - Define local and global behaviour and the assoc
DNMsy1 - Develop the analysis geometry based on drawi and other available information.
DNMco1 - Illustrate the 3D projection of the 2D plane stra sumptions.
DNMap1 - Apply appropriate simplifications to the analysis ocess without significantly affecting outputs.
DNMap2 - Choose appropriate solution methods conv

COMPETENCY STATEMENT

Code: **DNMkn1** Cognitive area: **Knowledge** NAFEMS level: **Standa**

Competency statement: **Identify the strengths, weaknesses, assumptions and limitations of an analysis program.**

Position of the detail menu in the page

Please note that the buttons available in the main, user and detail menus will change depending on the user role and permissions. Additionally, the detail menu will dynamically change adapting to the type of the item selected in the master area.

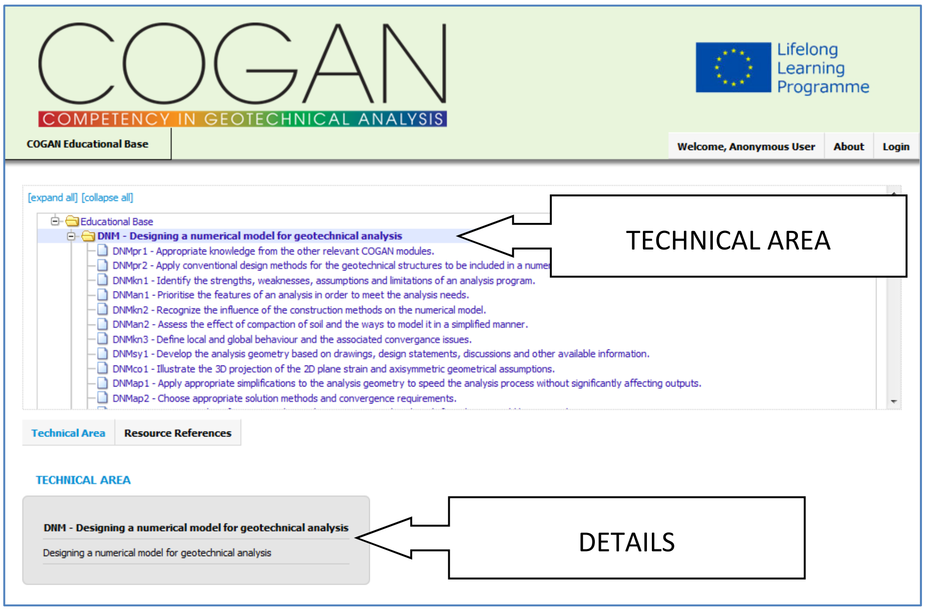
Technical Areas and Competence Statements

The Educational Base can be accessed by clicking on the main menu

COGAN Educational Base > *Competence Statements*

As previously said, the Educational Base is subdivided into Technical Areas, each one containing a number of competence statements. On average, each Technical Area contains 30 to 60 statements; overall, about 800 competence statements are provided.

The Educational Base is presented to the user as a tree in the master area of the page. Clicking on any item in the tree will cause the item to be selected in the master area and displayed in bold font, and its details to be displayed in the detail area of the page.



Educational Base

DNM - Designing a numerical model for geotechnical analysis

- DNMpr1 - Appropriate knowledge from the other relevant COGAN modules.
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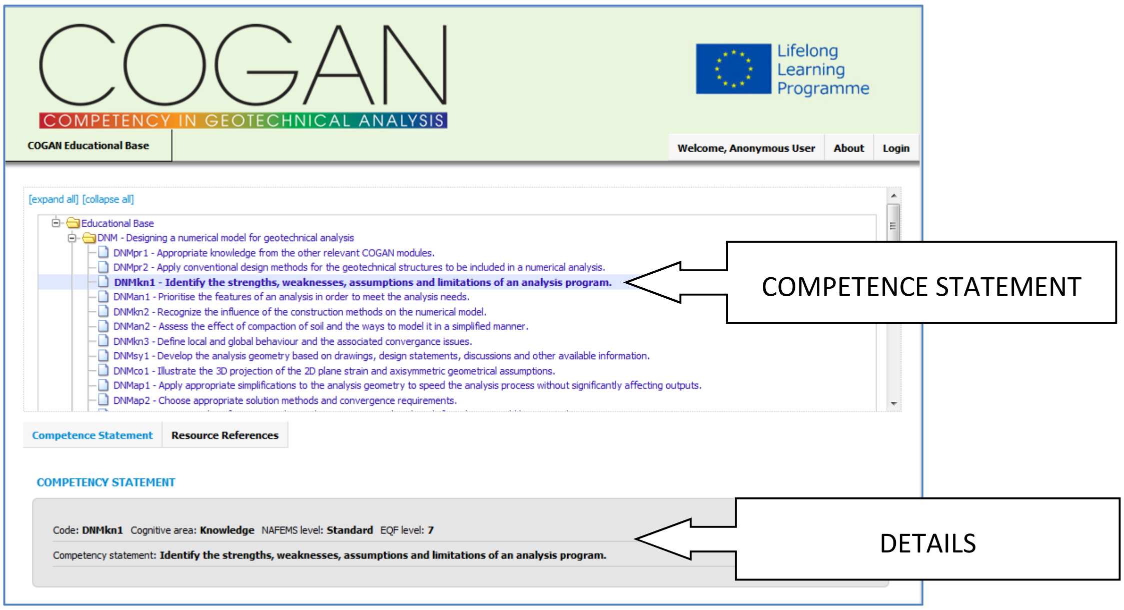
- DNMkn1 - Identify the strengths, weaknesses, assumptions and limitations of an analysis program.
- DNMan1 - Prioritise the features of an analysis in order to meet the analysis needs.
- DNMkn2 - Recognize the influence of the construction methods on the numerical model.
- DNMan2 - Assess the effect of compaction of soil and the ways to model it in a simplified manner.
- DNMkn3 - Define local and global behaviour and the associated convergance issues.
- DNMsy1 - Develop the analysis geometry based on drawings, design statements, discussions and other available information.
- DNMco1 - Illustrate the 3D projection of the 2D plane strain and axisymmetric geometrical assumptions.
- DNMap1 - Apply appropriate simplifications to the analysis geometry to speed the analysis process without significantly affecting outputs.
- DNMap2 - Choose appropriate solution methods and convergence requirements.

TECHNICAL AREA

DNM - Designing a numerical model for geotechnical analysis

Designing a numerical model for geotechnical analysis

Selecting any Technical Area displays the Technical Area's details



Educational Base
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DNMap1 - Apply appropriate simplifications to the analysis geometry to speed the analysis process without significantly affecting outputs.
DNMap2 - Choose appropriate solution methods and convergence requirements.

COMPETENCY STATEMENT

Code: **DNMkn1** Cognitive area: **Knowledge** NAFEMS level: **Standard** EQF level: **7**

Competency statement: **Identify the strengths, weaknesses, assumptions and limitations of an analysis program.**

Selecting any competence statement displays the competence statement's details: note that the detail menu dynamically adapts to the type of the selected item

Inside a Technical Area, competence statements are usually presented in an order that generally reflects ascending competence: that is, basic competences are presented at the top of the list, while higher level competences are presented at the bottom. Each competence statement includes information regarding the level of the competence relative to three scales: a **Cognitive area**, a **NAFEMS level** and an **EQF level**.

The Cognitive area refers to one of the following seven levels of competence, listed in ascending order:

- Pre-requisites
- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

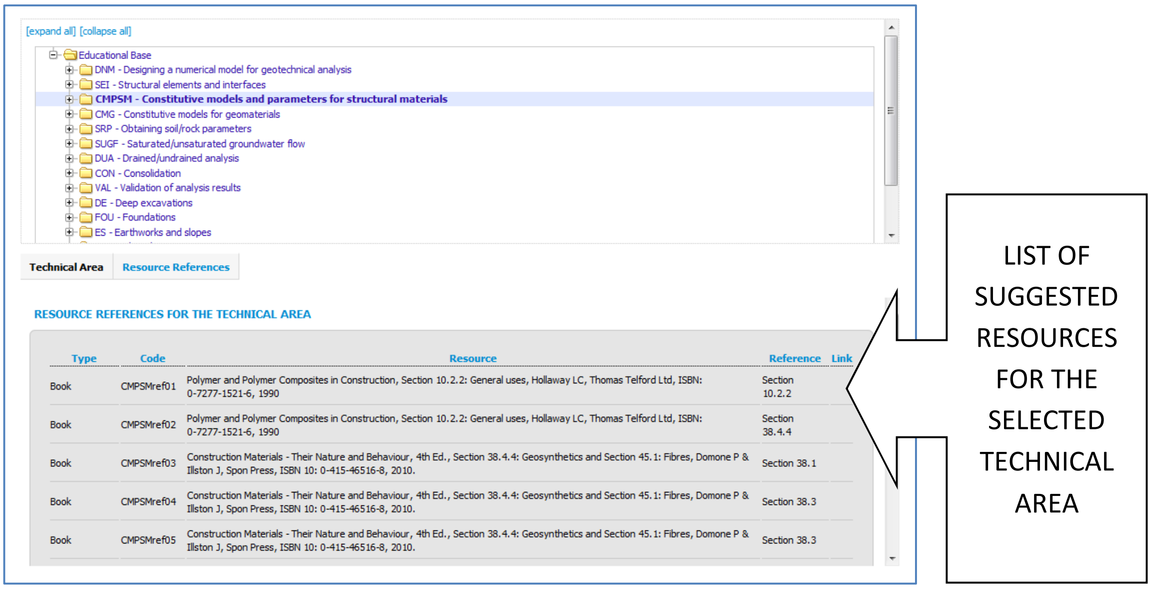
The NAFEMS level is a two levels scale: S stands for Standard level, while A stands for Advanced level.

EQF stands for European Qualifications Framework. Generally, in this scale:

- level 6 refers to a bachelor or undergraduate level
- level 7 refers to a master's degree level
- level 8 refers to doctorate level

Suggested educational resources by Technical Area and Competence Statement

In general, for each competence statement a list of recommended educational resources is provided. The list of the recommended resources is available by clicking on *Resource References* in the detail menu. If a Technical Area is selected, the list of the recommended resources for all the competence statements in the Technical Area is provided.


[expand all] [collapse all]
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DE - Deep excavations
FOU - Foundations
ES - Earthworks and slopes
Technical Area
Resource References

RESOURCE REFERENCES FOR THE TECHNICAL AREA

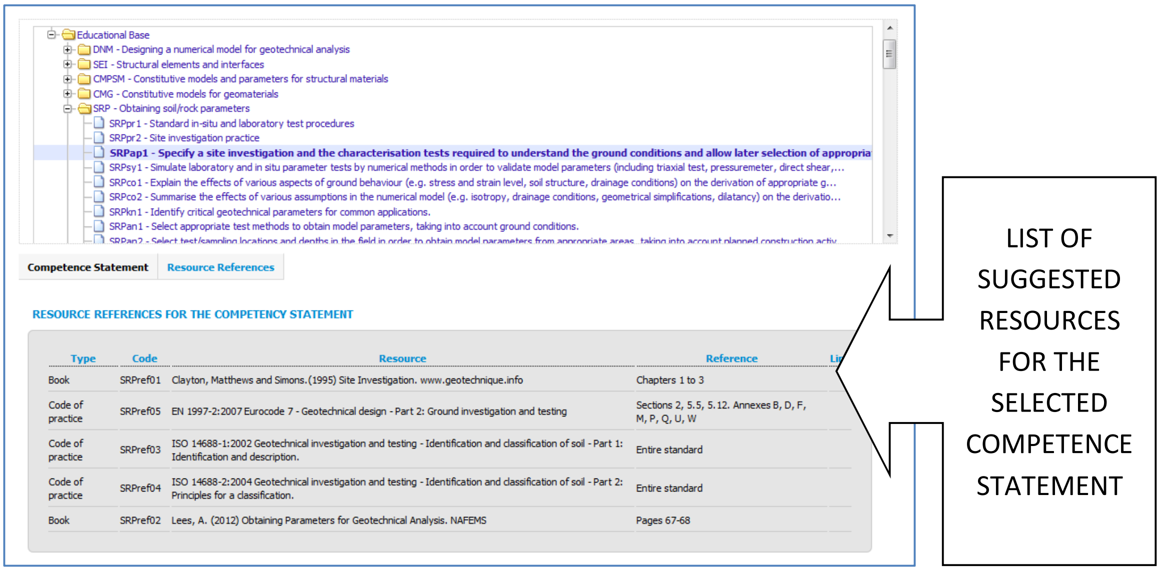
Type	Code	Resource	Reference	Link
Book	CMPSMref01	Polymer and Polymer Composites in Construction, Section 10.2.2: General uses, Hollaway LC, Thomas Telford Ltd, ISBN: 0-7277-1521-6, 1990	Section 10.2.2	
Book	CMPSMref02	Polymer and Polymer Composites in Construction, Section 10.2.2: General uses, Hollaway LC, Thomas Telford Ltd, ISBN: 0-7277-1521-6, 1990	Section 38.4.4	
Book	CMPSMref03	Construction Materials - Their Nature and Behaviour, 4th Ed., Section 38.4.4: Geosynthetics and Section 45.1: Fibres, Domone P & Illston J, Spon Press, ISBN 10: 0-415-46516-8, 2010.	Section 38.1	
Book	CMPSMref04	Construction Materials - Their Nature and Behaviour, 4th Ed., Section 38.4.4: Geosynthetics and Section 45.1: Fibres, Domone P & Illston J, Spon Press, ISBN 10: 0-415-46516-8, 2010.	Section 38.3	
Book	CMPSMref05	Construction Materials - Their Nature and Behaviour, 4th Ed., Section 38.4.4: Geosynthetics and Section 45.1: Fibres, Domone P & Illston J, Spon Press, ISBN 10: 0-415-46516-8, 2010.	Section 38.3	

LIST OF SUGGESTED RESOURCES FOR THE SELECTED TECHNICAL AREA

Suggested educational resources for the selected Technical Area

Educational resources can be books, papers, codes of practice, etc. A reference to the relevant chapter(s) or page(s) is usually provided for each resource.

Please note that a given educational resource, e.g. a book, can appear several times in the list: this happens when the resource is referenced by multiple competence statements. In the above image for example the book “Construction Materials – Their Nature and Behaviour” is listed several times, because it is a suggested educational resource for several competence statements.



- Educational Base
  - DNM - Designing a numerical model for geotechnical analysis
  - SEI - Structural elements and interfaces
  - CMPSM - Constitutive models and parameters for structural materials
  - CMG - Constitutive models for geomaterials
  - SRP - Obtaining soil/rock parameters
    - SRPpr1 - Standard in-situ and laboratory test procedures
    - SRPpr2 - Site investigation practice
    - **SRPap1 - Specify a site investigation and the characterisation tests required to understand the ground conditions and allow later selection of appropria**
    - SRPsy1 - Simulate laboratory and in situ parameter tests by numerical methods in order to validate model parameters (including triaxial test, pressuremeter, direct shear,...
    - SRPco1 - Explain the effects of various aspects of ground behaviour (e.g. stress and strain level, soil structure, drainage conditions) on the derivation of appropriate g...
    - SRPco2 - Summarise the effects of various assumptions in the numerical model (e.g. isotropy, drainage conditions, geometrical simplifications, dilatancy) on the derivatio...
    - SRPkn1 - Identify critical geotechnical parameters for common applications.
    - SRPan1 - Select appropriate test methods to obtain model parameters, taking into account ground conditions.
    - SRPan2 - Select test/sampling locations and depths in the field in order to obtain model parameters from appropriate areas, taking into account planned construction activ

RESOURCE REFERENCES FOR THE COMPETENCY STATEMENT

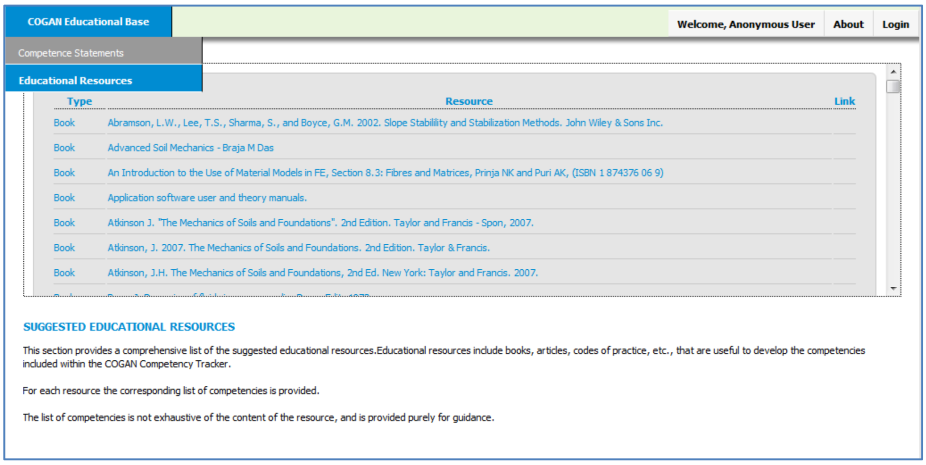
Type	Code	Resource	Reference	Li
Book	SRPref01	Clayton, Matthews and Simons.(1995) Site Investigation. www.geotechnique.info	Chapters 1 to 3	
Code of practice	SRPref05	EN 1997-2:2007 Eurocode 7 - Geotechnical design - Part 2: Ground investigation and testing	Sections 2, 5.5, 5.12. Annexes B, D, F, M, P, Q, U, W	
Code of practice	SRPref03	ISO 14688-1:2002 Geotechnical investigation and testing - Identification and classification of soil - Part 1: Identification and description.	Entire standard	
Code of practice	SRPref04	ISO 14688-2:2004 Geotechnical investigation and testing - Identification and classification of soil - Part 2: Principles for a classification.	Entire standard	
Book	SRPref02	Lees, A. (2012) Obtaining Parameters for Geotechnical Analysis. NAFEMS	Pages 67-68	

LIST OF SUGGESTED RESOURCES FOR THE SELECTED COMPETENCE STATEMENT

List of suggested educational resources for the selected competence statement

Browsing the educational resources

Clicking *COGAN Educational Base* > *Educational Resources* in the main menu provides a different way to navigate the database of the suggested educational resources: the complete list of the suggested resources is provided.



Type	Resource	Link
Book	Abramson, L.W., Lee, T.S., Sharma, S., and Boyce, G.M. 2002. Slope Stability and Stabilization Methods. John Wiley & Sons Inc.	
Book	Advanced Soil Mechanics - Braja M Das	
Book	An Introduction to the Use of Material Models in FE, Section 8.3: Fibres and Matrices, Prinja NK and Puri AK, (ISBN 1 874376 06 9)	
Book	Application software user and theory manuals.	
Book	Atkinson J. "The Mechanics of Soils and Foundations". 2nd Edition. Taylor and Francis - Spon, 2007.	
Book	Atkinson, J. 2007. The Mechanics of Soils and Foundations. 2nd Edition. Taylor & Francis.	
Book	Atkinson, J.H. The Mechanics of Soils and Foundations, 2nd Ed. New York: Taylor and Francis. 2007.	

SUGGESTED EDUCATIONAL RESOURCES

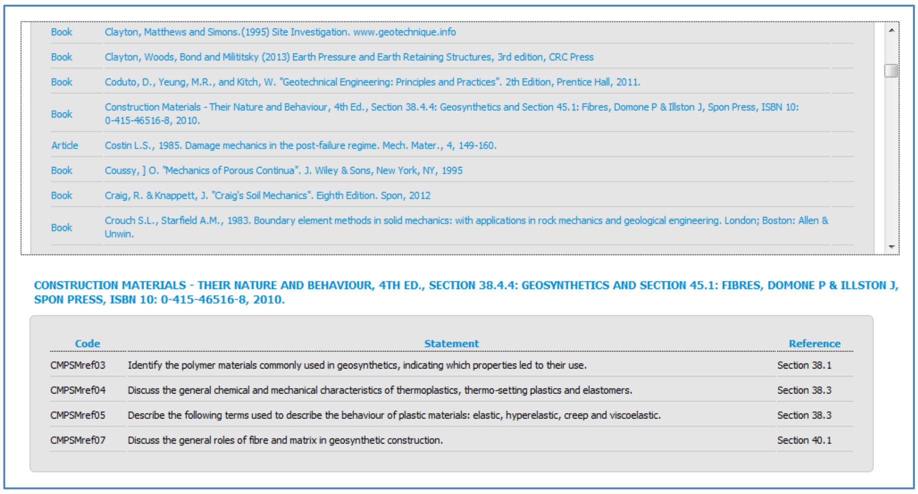
This section provides a comprehensive list of the suggested educational resources.Educational resources include books, articles, codes of practice, etc., that are useful to develop the competencies included within the COGAN Competency Tracker.

For each resource the corresponding list of competencies is provided.

The list of competencies is not exhaustive of the content of the resource, and is provided purely for guidance.

Accessing the complete list of the suggested educational resources

Selecting a resource in the master area causes the corresponding competences (competence statements) to be listed in the detail area. Please note that the list of competences is not exaustive of the content of the resource, and is provided as a guide to the novice.



Book	Clayton, Matthews and Simons.(1995) Site Investigation. www.geotechnique.info
Book	Clayton, Woods, Bond and Milititsky (2013) Earth Pressure and Earth Retaining Structures, 3rd edition, CRC Press
Book	Coduto, D., Yeung, M.R., and Kitch, W. "Geotechnical Engineering: Principles and Practices". 2th Edition, Prentice Hall, 2011.
Book	Construction Materials - Their Nature and Behaviour, 4th Ed., Section 38.4.4: Geosynthetics and Section 45.1: Fibres, Domone P & Illston J, Spon Press, ISBN 10: 0-415-46516-8, 2010.
Article	Costin L.S., 1985. Damage mechanics in the post-failure regime. Mech. Mater., 4, 149-160.
Book	Coussy,] O. "Mechanics of Porous Continua". J. Wiley & Sons, New York, NY, 1995
Book	Craig, R. & Knappett, J. "Craig's Soil Mechanics". Eighth Edition. Spon, 2012
Book	Crouch S.L., Starfield A.M., 1983. Boundary element methods in solid mechanics: with applications in rock mechanics and geological engineering. London; Boston: Allen & Unwin.

CONSTRUCTION MATERIALS - THEIR NATURE AND BEHAVIOUR, 4TH ED., SECTION 38.4.4: GEOSYNTHETICS AND SECTION 45.1: FIBRES, DOMONE P & ILLSTON J, SPON PRESS, ISBN 10: 0-415-46516-8, 2010.

Code	Statement	Reference
CMPSMref03	Identify the polymer materials commonly used in geosynthetics, indicating which properties led to their use.	Section 38.1
CMPSMref04	Discuss the general chemical and mechanical characteristics of thermoplastics, thermo-setting plastics and elastomers.	Section 38.3
CMPSMref05	Describe the following terms used to describe the behaviour of plastic materials: elastic, hyperelastic, creep and viscoelastic.	Section 38.3
CMPSMref07	Discuss the general roles of fibre and matrix in geosynthetic construction.	Section 40.1

Competences corresponding to the selected educational resource

Claiming competences

Registered users access to the Competency Tracker

Registering a new user

Depending on the set up of the Competency Tracker, signing in the Competency Tracker is available either through:

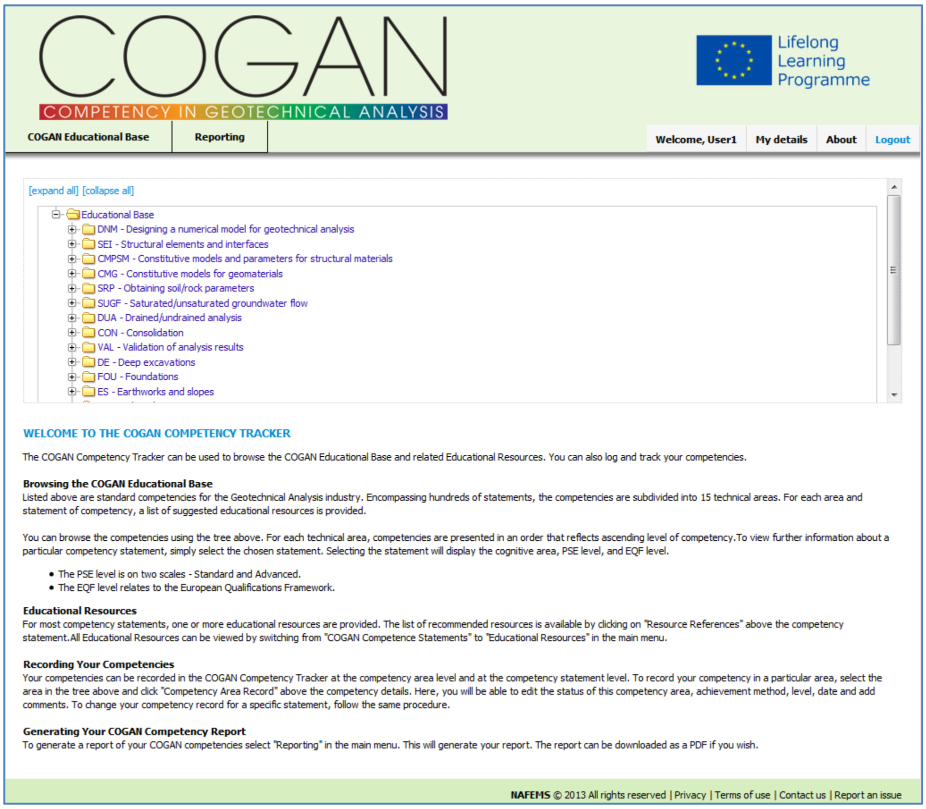
- a public form in the “user registration” box in the homepage;
- a separate “user registration” page.

During the current testing phase, both these options are disabled.

Therefore, to receive your account information you may:

- contact the email address provided in the Competency Tracker homepage, or
- contact the person who invited you to test the Tracker.

After signing in, you will be presented with a welcome message and a *My details* button in the user menu. The main menu and the welcome message in the detail area also change.


COGAN
COMPETENCY IN GEOTECHNICAL ANALYSIS
Lifelong Learning Programme
COGAN Educational Base
Reporting
Welcome, User1
My details
About
Logout
[expand all] [collapse all]

- Educational Base
  - DNM - Designing a numerical model for geotechnical analysis
  - SEI - Structural elements and interfaces
  - CMPSM - Constitutive models and parameters for structural materials
  - CMG - Constitutive models for geomaterials
  - SRP - Obtaining soil/rock parameters
  - SUGF - Saturated/unsaturated groundwater flow
  - DUA - Drained/undrained analysis
  - CON - Consolidation
  - VAL - Validation of analysis results
  - DE - Deep excavations
  - FOU - Foundations
  - ES - Earthworks and slopes

WELCOME TO THE COGAN COMPETENCY TRACKER

The COGAN Competency Tracker can be used to browse the COGAN Educational Base and related Educational Resources. You can also log and track your competencies.

Browsing the COGAN Educational Base
Listed above are standard competencies for the Geotechnical Analysis industry. Encompassing hundreds of statements, the competencies are subdivided into 15 technical areas. For each area and statement of competency, a list of suggested educational resources is provided.

You can browse the competencies using the tree above. For each technical area, competencies are presented in an order that reflects ascending level of competency.To view further information about a particular competency statement, simply select the chosen statement. Selecting the statement will display the cognitive area, PSE level, and EQF level.

- The PSE level is on two scales - Standard and Advanced.
- The EQF level relates to the European Qualifications Framework.

Educational Resources
For most competency statements, one or more educational resources are provided. The list of recommended resources is available by clicking on "Resource References" above the competency statement.All Educational Resources can be viewed by switching from "COGAN Competence Statements" to "Educational Resources" in the main menu.

Recording Your Competencies
Your competencies can be recorded in the COGAN Competency Tracker at the competency area level and at the competency statement level. To record your competency in a particular area, select the area in the tree above and click "Competency Area Record" above the competency details. Here, you will be able to edit the status of this competency area, achievement method, level, date and add comments. To change your competency record for a specific statement, follow the same procedure.

Generating Your COGAN Competency Report
To generate a report of your COGAN competencies select "Reporting" in the main menu. This will generate your report. The report can be downloaded as a PDF if you wish.

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Additional menu buttons for a registered user

User roles

Understanding user roles

The features available to a user in the Competency Tracker depend on the **role** associated to his/her account. The Competency Tracker provides a flexible and fine grained roles and permissions system that allows to create different roles. For the COGAN testing purposes the following roles are provided:

- Anonymous User
- Registered User
- Educational Base Editor
- Educational Base Reviewer
- Group manager
- Human Resources manager
- Administrator

This manual describes the features available for the Anonymous User, Registered User and Group Manager roles only. The features available to the other roles are described in a separate document.

The overall roles can by summarized as follows:

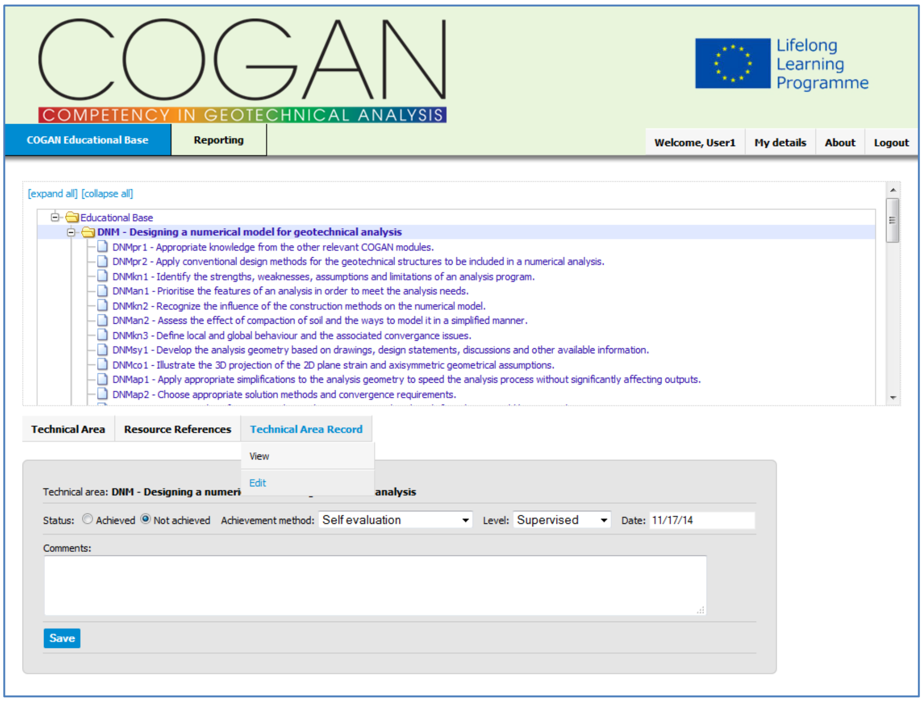
- an Anonymous User can only browse the educational base;
- a Registered User can browse the educational base, amend his/her own competences, and generate a report of his/her own competences;
- an Educational Base Editor can create a new draft of the educational base and the educational resources;
- an Educational Base Reviewer can edit and approve educational base drafts;
- a Group manager has all the Registered User permissions, plus he/she can:
    - create new Registered Users,
    - create new User Groups and manage them,
    - assign Users to groups,
    - generate reports of the competences of the Users that belong to the group(s) he/she manages;
- the HR manager can generate reports of the competences of all the users of the Competency Tracker. He/she can create new users, create new user groups, and populate groups with users, irrespective from who created the users in the first place. The HR manager can also appoint manager user(s) for each user group. HR managers cannot create, edit or delete Administrator accounts;
- an Administrator has all the available permissions.

Registered User role

The Competency Tracker from a registered user perspective

By design, the competences that are tracked and logged in the Competency Tracker should be solely inputted by the user that possesses the competence: users are thus directly responsible to input and maintain up-to-date their own competence records.

Users of the Competency Tracker have access to some additional features: a *reporting* section in the main menu area and to two additional sections in the detail menu area: *Technical Area record* and *competence record*. These sections will be described in the next paragraphs.



Educational Base
DNM - Designing a numerical model for geotechnical analysis
DNMpr1 - Appropriate knowledge from the other relevant COGAN modules.
DNMpr2 - Apply conventional design methods for the geotechnical structures to be included in a numerical analysis.
DNMkn1 - Identify the strengths, weaknesses, assumptions and limitations of an analysis program.
DNMan1 - Prioritise the features of an analysis in order to meet the analysis needs.
DNMkn2 - Recognize the influence of the construction methods on the numerical model.
DNMan2 - Assess the effect of compaction of soil and the ways to model it in a simplified manner.
DNMkn3 - Define local and global behaviour and the associated convergance issues.
DNMsy1 - Develop the analysis geometry based on drawings, design statements, discussions and other available information.
DNMco1 - Illustrate the 3D projection of the 2D plane strain and axisymmetric geometrical assumptions.
DNMap1 - Apply appropriate simplifications to the analysis geometry to speed the analysis process without significantly affecting outputs.
DNMap2 - Choose appropriate solution methods and convergence requirements.

Technical area: **DNM - Designing a numeri** **analysis**

Status: ○ Achieved ● Not achieved Achievement method: Self evaluation Level: Supervised Date: 11/17/14

Comments:

Editing your Technical Area record

Recording your competence

Competences can be recorded in the Competency Tracker at two levels of detail: the technical area level and the competence statement level. In the remainder of this manual we will refer to these two competence records as **technical area record** and **competence statement record**.

Browse the educational base tree and select a technical area in the master area of the page: the detail of the technical area will appear in the detail area. Now click on *Technical Area Record* > *Edit* to access the record editing form. Complete the required fields and click on the *save* button: your Technical Area record will be saved in the database.

Technical area records have the following editable fields:

- **Status**: either "achieved" or "not achieved", meaning that the current user possesses the competence or not.

- **Achievement method**:
  - "**self evaluation**", meaning that the evaluation has been made solely by the user owning the competence,
  - "**independent evaluation**", meaning that a body external to the company evaluated the user competences,
  - "**line manager evaluation**", meaning that a person or body inside the company evaluated the user competences
- **Level**: this field expresses your level of competence in the area. Please note that the number and wording of the levels can be customised, and in general may vary from company to company. By default, the Competency Tracker provides three levels of competence:
  - "**supervised**", meaning you are able to undertake work under supervision,
  - "**unsupervised**", meaning you are able to undertake work autonomously,
  - "**expert**", meaning that you are able to act as an advisor and lead work teams.
- **Date**: the last date the record was edited; by default the current date, but it can be overwritten.
- **Comments**: a free field where comments, limitations and clarifications can be provided.

After saving your Technical Area record you can review the saved information by clicking *Technical Area Record* > *View* .

In a similar way it is possible to edit your competence statement record. Select a competence statement in the master area of the page: the detail of the competence statement will appear in the detail area. Now click on *Competence Record* > *Edit* to access the record editing form. Complete the required fields and click on the *save* button: your competence statement record will be saved in the database.

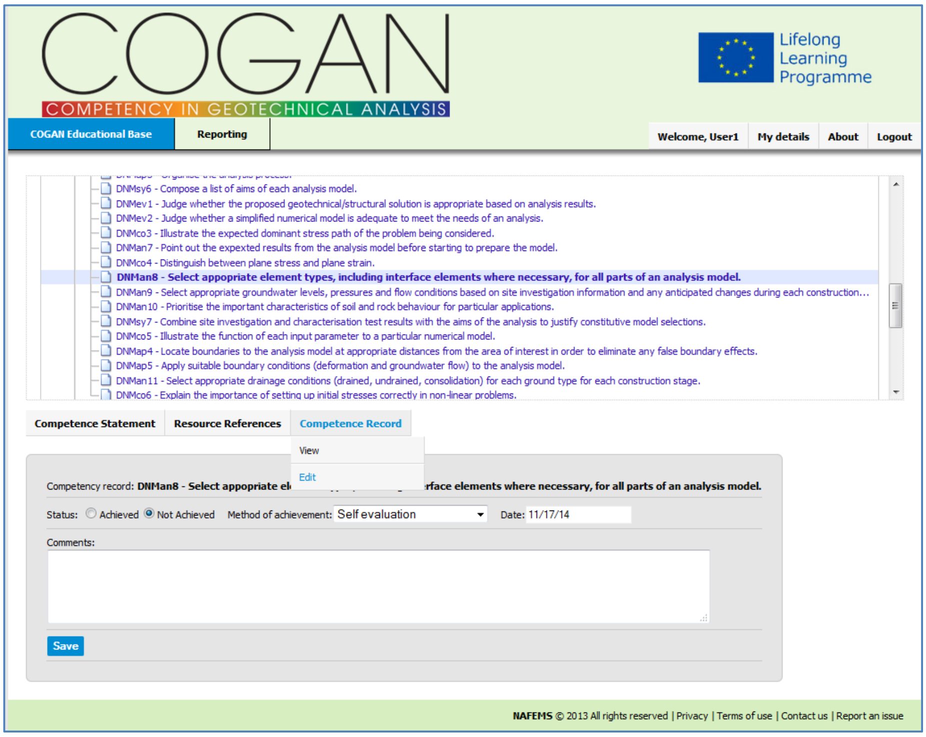
Competence statement records have the following editable fields:

- **Status**: either "achieved" or "not achieved", meaning that you possess the competence or not.
- **Achievement method**: either "self evaluation", "independent evaluation" or "line manager evaluation".
- **Date**: the last date the record was edited; by default the current date, but it can be overwritten.
- **Comments**: a free field where comments, limitations and clarifications can be provided.

After saving your competence statement record you can review the saved information by clicking *Competence Record* > *View*.

Other fields automatically generated by the Competency Tracker are:

- **Edited by**: either "User", if directly generated/updated by the user, or "Competency Tracker", if the competence record has been automatically ported by the Competency Tracker from a previous version of the Educational Base. The latter case will occur when the Educational Base is edited and a new version is published.
- **Up-to-date**: either "Yes" or "Needs reviewing". The latter indicates that the competence statement the has got a major update, therefore the competence record needs to be reviewed by the user.



- DNMsy6 - Compose a list of aims of each analysis model.
- DNMev1 - Judge whether the proposed geotechnical/structural solution is appropriate based on analysis results.
- DNMev2 - Judge whether a simplified numerical model is adequate to meet the needs of an analysis.
- DNMco3 - Illustrate the expected dominant stress path of the problem being considered.
- DNMan7 - Point out the expexted results from the analysis model before starting to prepare the model.
- DNMco4 - Distinguish between plane stress and plane strain.
- **DNMan8 - Select appopriate element types, including interface elements where necessary, for all parts of an analysis model.**
- DNMan9 - Select appropriate groundwater levels, pressures and flow conditions based on site investigation information and any anticipated changes during each construction…
- DNMan10 - Prioritise the important characteristics of soil and rock behaviour for particular applications.
- DNMsy7 - Combine site investigation and characterisation test results with the aims of the analysis to justify constitutive model selections.
- DNMco5 - Illustrate the function of each input parameter to a particular numerical model.
- DNMap4 - Locate boundaries to the analysis model at appropriate distances from the area of interest in order to eliminate any false boundary effects.
- DNMap5 - Apply suitable boundary conditions (deformation and groundwater flow) to the analysis model.
- DNMan11 - Select appropriate drainage conditions (drained, undrained, consolidation) for each ground type for each construction stage.
- DNMco6 - Explain the importance of setting up initial stresses correctly in non-linear problems.

Competency record: **DNMan8 - Select appropriate el rface elements where necessary, for all parts of an analysis model.**

Status: ○ Achieved ● Not Achieved Method of achievement: Self evaluation Date: 11/17/14

Comments:

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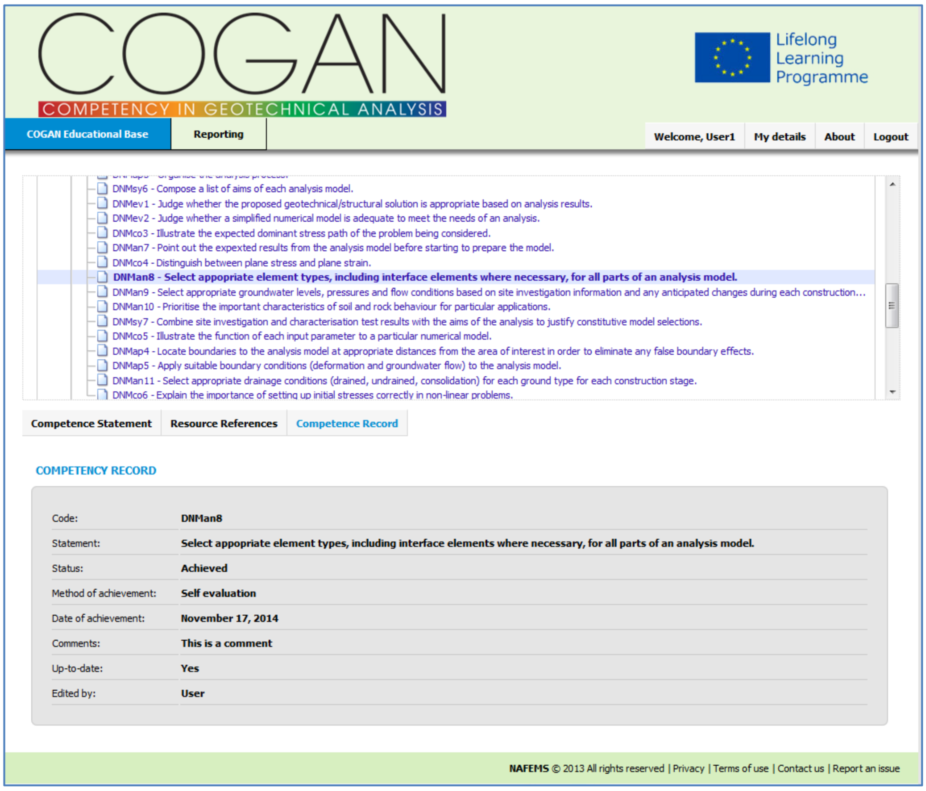
Editing your competence statement record



- DNMsy6 - Compose a list of aims of each analysis model.
- DNMev1 - Judge whether the proposed geotechnical/structural solution is appropriate based on analysis results.
- DNMev2 - Judge whether a simplified numerical model is adequate to meet the needs of an analysis.
- DNMco3 - Illustrate the expected dominant stress path of the problem being considered.
- DNMan7 - Point out the expexted results from the analysis model before starting to prepare the model.
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- **DNMan8 - Select appopriate element types, including interface elements where necessary, for all parts of an analysis model.**
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- DNMap5 - Apply suitable boundary conditions (deformation and groundwater flow) to the analysis model.
- DNMan11 - Select appropriate drainage conditions (drained, undrained, consolidation) for each ground type for each construction stage.
- DNMco6 - Explain the importance of setting up initial stresses correctly in non-linear problems.

COMPETENCY RECORD

Code:	**DNMan8**
Statement:	**Select appropriate element types, including interface elements where necessary, for all parts of an analysis model.**
Status:	**Achieved**
Method of achievement:	**Self evaluation**
Date of achievement:	**November 17, 2014**
Comments:	**This is a comment**
Up-to-date:	**Yes**
Edited by:	**User**

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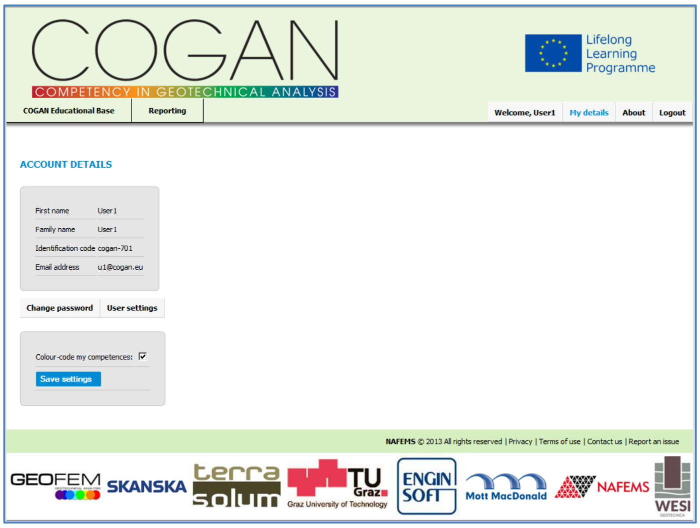
Resulting competence statement record

Colour-coding competences

The Competency Tracker provides to the Registered User a convenient way to identify recorded competences by colour-coding them. This feature is available under the menu _My details > User settings_ and can be activated by checking the appropriate box and saving the settings.


COGAN
COMPETENCY IN GEOTECHNICAL ANALYSIS
Lifelong Learning Programme
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Reporting
Welcome, User1
My details
About
Logout
Change password
User settings
Save settings
GEOFEM
SKANSKA
terra solum
TU Graz
Graz University of Technology
ENGIN SOFT
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ACCOUNT DETAILS

First name	User1
Family name	User1
Identification code	cogan-701
Email address	u1@cogan.eu

Colour-code my competences: ☑

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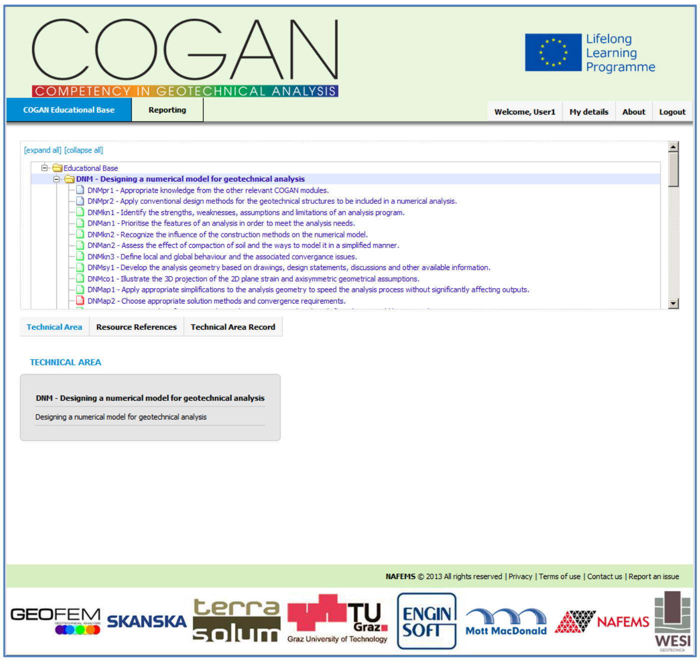
Activating the colour-coding competences feature

After this feature is activated the competence statement icons are coloured according to the status of the corresponding record: green for “achieved”, red for “not achieved” and grey for “not defined”.


COGAN
COMPETENCY IN GEOTECHNICAL ANALYSIS
Lifelong Learning Programme
COGAN Educational Base
Reporting
Welcome, User1
My details
About
Logout
[expand all] [collapse all]
Technical Area
Resource References
Technical Area Record
GEOFEM
SKANSKA
terra solum
TU Graz
Graz University of Technology
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- Educational Base
  - DNM - Designing a numerical model for geotechnical analysis
    - DNMpr1 - Appropriate knowledge from the other relevant COGAN modules.
    - DNMpr2 - Apply conventional design methods for the geotechnical structures to be included in a numerical analysis.
    - DNMkn1 - Identify the strengths, weaknesses, assumptions and limitations of an analysis program.
    - DNMan1 - Prioritise the features of an analysis in order to meet the analysis needs.
    - DNMkn2 - Recognize the influence of the construction methods on the numerical model.
    - DNMan2 - Assess the effect of compaction of soil and the ways to model it in a simplified manner.
    - DNMkn3 - Define local and global behaviour and the associated convergance issues.
    - DNMsy1 - Develop the analysis geometry based on drawings, design statements, discussions and other available information.
    - DNMco1 - Illustrate the 3D projection of the 2D plane strain and axisymmetric geometrical assumptions.
    - DNMap1 - Apply appropriate simplifications to the analysis geometry to speed the analysis process without significantly affecting outputs.
    - DNMap2 - Choose appropriate solution methods and convergence requirements.

TECHNICAL AREA

DNM - Designing a numerical model for geotechnical analysis

Designing a numerical model for geotechnical analysis

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Effects of colour-coding competences

Generating a report of your recorded competence

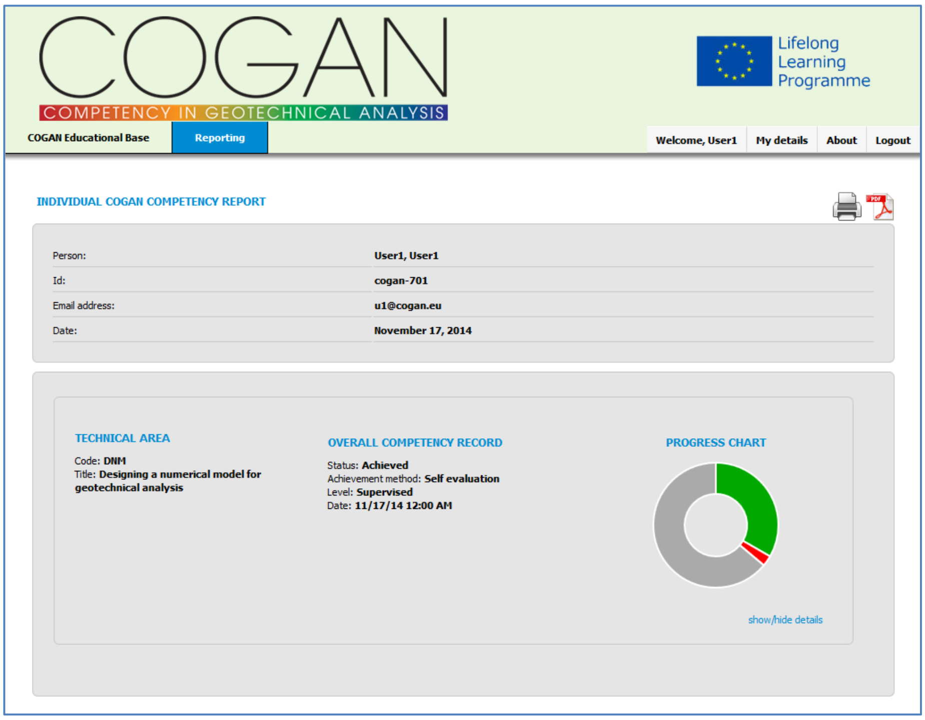
The current user can generate a report of his/her competences by clicking on *Reporting* > *My Competence Records* in the main menu. This individual competence report includes both recorded technical area and competence statement records.

The report is subdivided into one or more sections, each one corresponding to a single Technical Area. A section is visible only if at least one competence record has been saved at either technical area or competence statement level. At either level, if a competence record is not present it is reported as “Not defined”.

A pie chart provides a glance of the recorded competence statement competences for the technical areas corresponding to each section. The pie chart uses the following colours:

- Green: “achieved” recorded competences
- Red: “not achieved” recorded competences
- Grey: competence record not present (not defined)

By default, details over the single competence statements records are provided in a collapsed panel: the panel can be shown by clicking *show / hide details* in each technical area box of the report.



INDIVIDUAL COGAN COMPETENCY REPORT

Person:	**User1, User1**
Id:	**cogan-701**
Email address:	**u1@cogan.eu**
Date:	**November 17, 2014**

TECHNICAL AREA
Code: **DNM**
Title: **Designing a numerical model for geotechnical analysis**

OVERALL COMPETENCY RECORD
Status: **Achieved**
Achievement method: **Self evaluation**
Level: **Supervised**
Date: **11/17/14 12:00 AM**

PROGRESS CHART

Individual competence report for the current user

Privacy of your competence records

By design, the competence records saved in the Competency Tracker can be accessed only by users with proper roles. These include Group manager, HR manager, Administrator roles. Nobody can edit other people’s records, anyway: a competence record can be edited only by the user owning that competence record.

Group manager role

The Competency Tracker from a group manager perspective

The Competency Tracker provides a mechanism to create sets of users called groups. Correspondingly, a group manager role is available in the Competency Tracker.

The group manager role corresponds to that of a team or project leader, who needs to track the competences of the personnel he/she manages. Therefore, the Competency Tracker provides group managers access to additional reporting sections where competences are reported by individual user, user group, or competence.

Group managers can also create new groups, create new Registered Users and assign them to a group.

Groups and group roles

Registered users can belong to one or more **user group**. Inside a group, a user can have one of two possible roles: **member** of the group or **manager** of the group.

It is important not to confuse the group manager role at Competency Tracker level with the group role at group level: the same user can be member of a group, and manager of another. On the other hand, the group manager role at Competency Tracker level affects the behavior of the Competency Tracker as a whole and provides to the user access to the additional reporting sections and user management features.

The following table aims to clarify the differences between a group manager at Competency Tracker level and a group manager at group level.

	Competency Tracker role	
	Group Manager	Registered User
Can manage a group	Yes	No
Can be member of a group	Yes	Yes
Access to additional reporting sections of the Competency Tracker	Yes	No
Create a new Registered User and add he/she to a managed group	Yes	No
Access to user details of a member of group “A”	Yes, if manager of group “A”	No

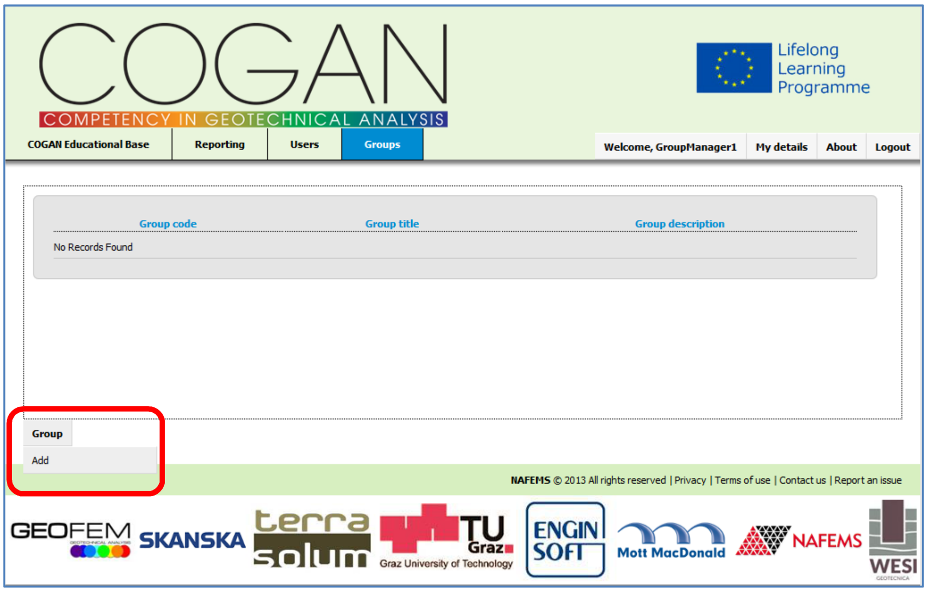
The Competency Tracker checks that only a group manager can manage a group. One or more group manager can manage the same group. A group manager can be a member of a group.

When a group manager creates a new group, the tracker automatically set him/her as manager of the group. A manager of a group has access to the details of the team members and the staffing of the groups he/she manages.

In the following example, we will describe how a group manager can generate competences reports and access other information. We will simulate that a “GroupManager1” user is managing a group called “Team A”. Members of group “Team A” are two Registered Users: “User1” and “User2”.

Managing groups

Group management is available by clicking *Groups* > *Manage Groups* in the main menu. The Competency Tracker will show a list of the existing user groups in the master area of the page. The detail menu will present a *Group* > *Add* button. When the group manager selects an existing group, the detail menu will present the full list of group management options: *View*, *Edit*, *Add* and *Delete*.


COGAN
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COGAN Educational Base
Reporting
Users
Groups
Welcome, GroupManager1
My details
About
Logout
Group code
Group title
Group description
Group
Add
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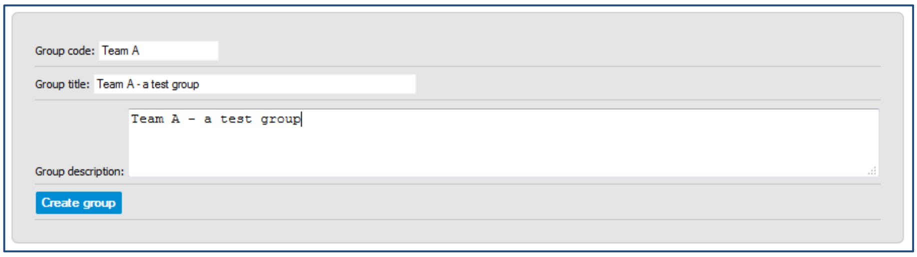
No Records Found

Creating a new group (1)



Group code: Team A

Group title: Team A - a test group

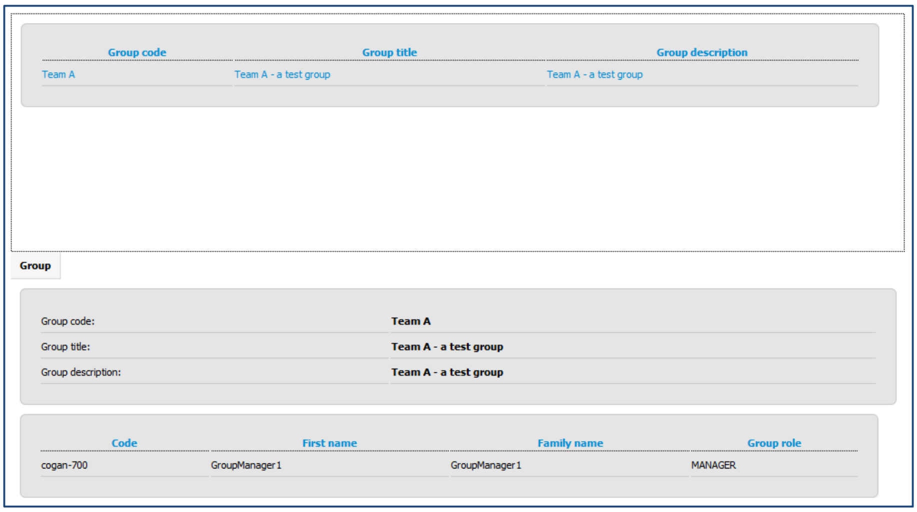
Group description: Team A - a test group

Create group

Creating a new group (2)

When a group manager creates a new group, the tracker automatically set him/her as manager of the group: the new group is populated only by the group manager herself. To add users to the group please refer to the “managing users” and “populating groups” chapters that follow.

Editing an existing group will not affect the members of the group and their group role. Deleting a group of users is, in general, a safe operation: users will not be deleted, as well as their competences recorded in the tracker, and the group can be created again later on.



Group code	Group title	Group description
Team A	Team A - a test group	Team A - a test group

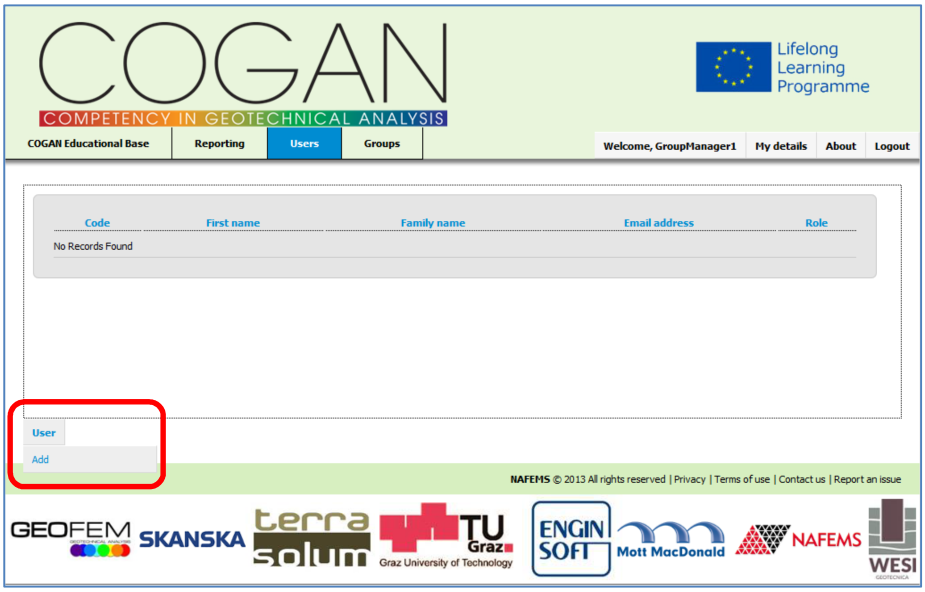
Group code:	**Team A**
Group title:	**Team A - a test group**
Group description:	**Team A - a test group**

Code	First name	Family name	Group role
cogan-700	GroupManager1	GroupManager1	MANAGER

A newly created group is populated only by the group manager

Adding users

User management features are available clicking on *Users* > *Manage Users* in the main menu. The Competency Tracker will show a list of the existing users in the master area of the page. For a newly created Group manager the initial managed users list is empty. The detail menu will present a *User* > *Add* button.



COGAN
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Lifelong Learning Programme
COGAN Educational Base
Reporting
Users
Groups
Welcome, GroupManager1
My details
About
Logout

Code	First name	Family name	Email address	Role
No Records Found				

User
Add
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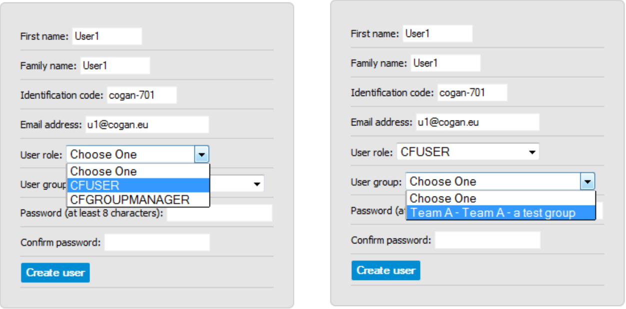
Creating a new Registered User (1)



First name: User1
Family name: User1
Identification code: cogan-701
Email address: u1@cogan.eu
User role: Choose One
User group:
Password (at least 8 characters):
Confirm password:

Choose One
CFUSER
CFGROUPMANAGER
Create user

First name: User1
Family name: User1
Identification code: cogan-701
Email address: u1@cogan.eu
User role: CFUSER
User group: Choose One
Password (a
Confirm password:

Choose One
Team A - Team A - a test group
Create user

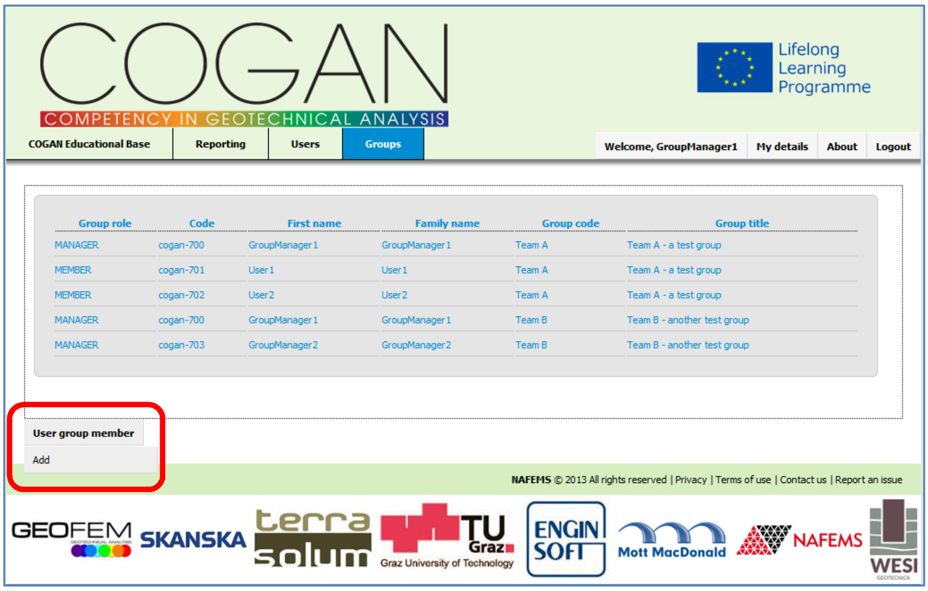
Creating a new Registered User (2)

The Group Manager needs to specify the role of the new registered user and a destination group. Available roles are “Registered User” or “Group Manager”. The tracker presents a list of groups that includes only those managed by the group manager. Assigning a group to the new user is mandatory because otherwise the group manager will not be able to access or manage the new user.

The **identification code** is the public part of the login information the user will need to provide during the login (in other systems it may be called “username” or “login name”). Passwords need to be at least 8 characters long. As a safety measure to avoid unwanted locking of the Competency Tracker, group managers cannot create or edit users possessing higher level roles, and delete any user.

Populating groups

Populating groups features are available by clicking on *Groups* > *Populate Groups* in the main menu. The Competency Tracker will show a list of the existing group memberships in the master area of the page. The detail menu will present a *User group member* > *Add* button. When an existing group membership is selected, the detail menu will present the full list of group membership management options: *View*, *Edit*, *Add* and *Delete*.



COGAN
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Lifelong Learning Programme
COGAN Educational Base
Reporting
Users
Groups
Welcome, GroupManager1
My details
About
Logout

Group role	Code	First name	Family name	Group code	Group title
MANAGER	cogan-700	GroupManager1	GroupManager1	Team A	Team A - a test group
MEMBER	cogan-701	User1	User1	Team A	Team A - a test group
MEMBER	cogan-702	User2	User2	Team A	Team A - a test group
MANAGER	cogan-700	GroupManager1	GroupManager1	Team B	Team B - another test group
MANAGER	cogan-703	GroupManager2	GroupManager2	Team B	Team B - another test group

User group member
Add
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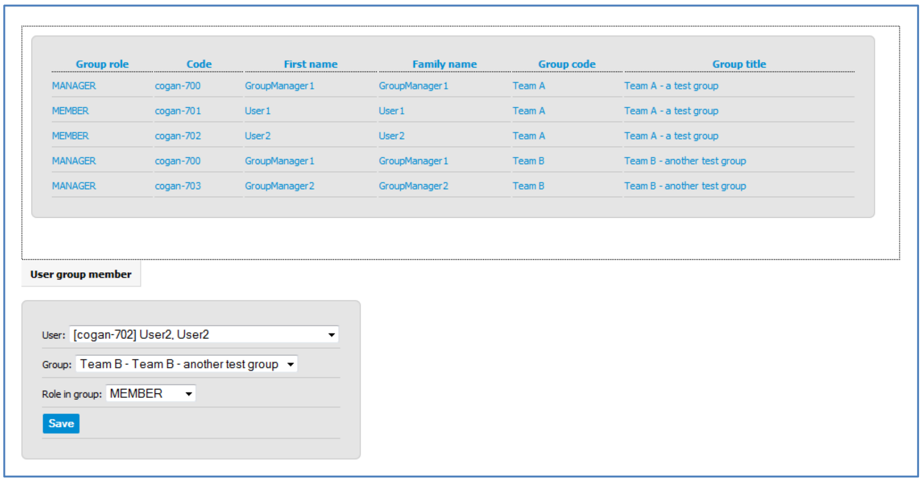
Accessing the populate groups features

The following example presents a list of five group memberships. Browsing the list, we note that users “User1” and “User2” are member of group “Team A”. In the example, user “GroupManager1” is manager of groups “Team A” and “Team B”. User “GroupManager2” is manager of the “Team B” group only.

We can add a new group membership by clicking _User group member_ > _Add_ in the detail menu. In the example we add the existing user “User2” to group “Team B” with a member role at group level.



Group role	Code	First name	Family name	Group code	Group title
MANAGER	cogan-700	GroupManager1	GroupManager1	Team A	Team A - a test group
MEMBER	cogan-701	User1	User1	Team A	Team A - a test group
MEMBER	cogan-702	User2	User2	Team A	Team A - a test group
MANAGER	cogan-700	GroupManager1	GroupManager1	Team B	Team B - another test group
MANAGER	cogan-703	GroupManager2	GroupManager2	Team B	Team B - another test group

User group member

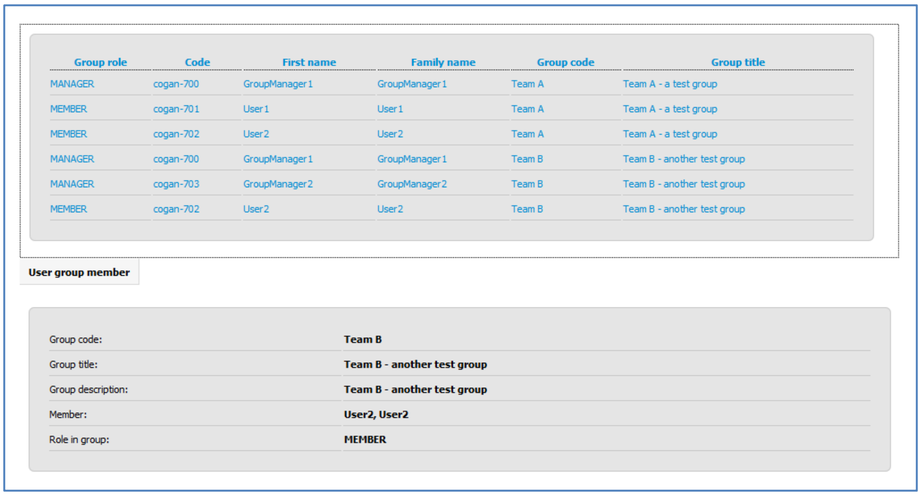
User: [cogan-702] User2, User2

Group: Team B - Team B - another test group

Role in group: MEMBER

Adding user “User2” as a member to group “Team B”

After clicking the _Save_ button the Competency Tracker adds the group membership to the database and shows it in the list in the master area. The same user “User2” now belongs to two different groups, with the same role at group level. By design, it is not possible to add multiple times the same user to a given group.



Group role	Code	First name	Family name	Group code	Group title
MANAGER	cogan-700	GroupManager1	GroupManager1	Team A	Team A - a test group
MEMBER	cogan-701	User1	User1	Team A	Team A - a test group
MEMBER	cogan-702	User2	User2	Team A	Team A - a test group
MANAGER	cogan-700	GroupManager1	GroupManager1	Team B	Team B - another test group
MANAGER	cogan-703	GroupManager2	GroupManager2	Team B	Team B - another test group
MEMBER	cogan-702	User2	User2	Team B	Team B - another test group

User group member

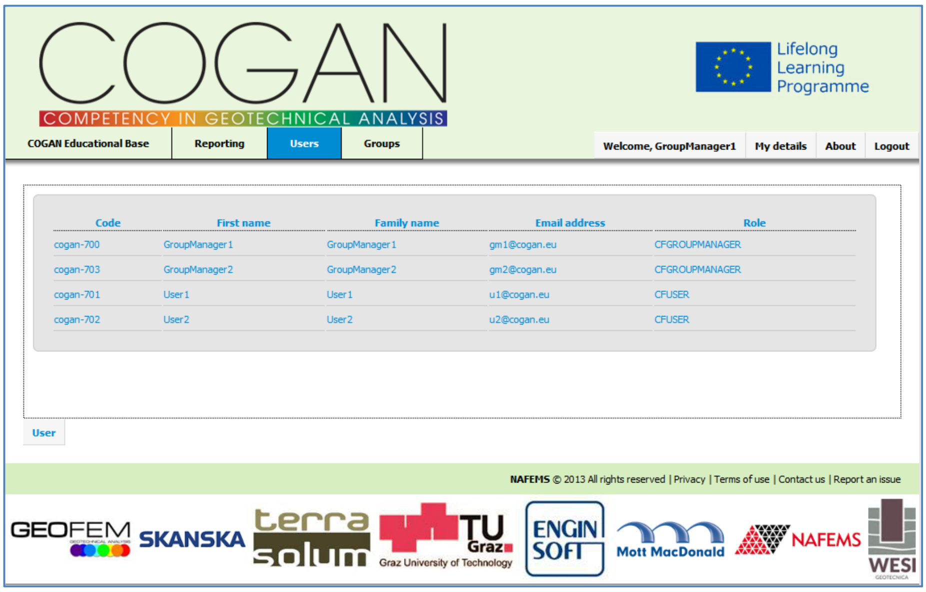
Group code:	**Team B**
Group title:	**Team B - another test group**
Group description:	**Team B - another test group**
Member:	**User2, User2**
Role in group:	**MEMBER**

Member “User2” added to “Team B”

Delete operations on user group memberships are, in general, safe operations. Group memberships can be created again later on. Please keep in mind that if you delete your membership as manager of a group, you will not be able to manage that group and the corresponding users any more, unless a privileged user assigns you as a manager of the same group again.

Managing users

At any time, a group manager can access the details of the users belonging to the managed groups: to do so click on _Users_ > _Manage Users_ in the main menu. The list of users in the master area shows only the users belonging to the managed groups. Selecting a user in the master area will show the user account details in the detail area of the page.


COGAN Educational Base
Reporting
Users
Groups
Welcome, GroupManager1
My details
About
Logout
User
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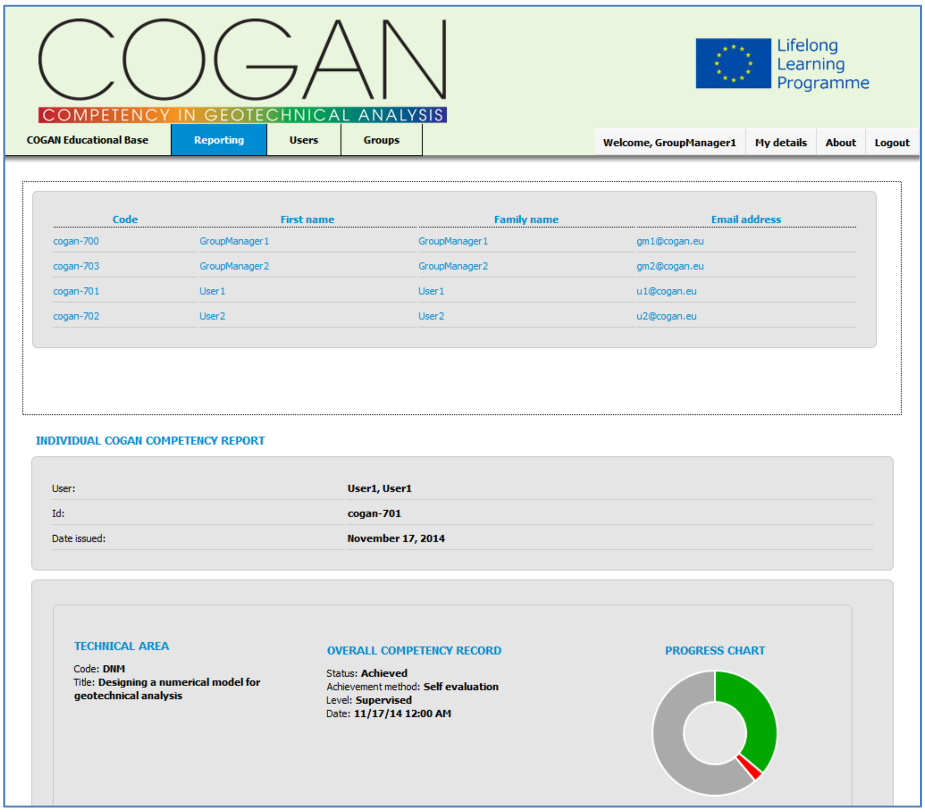
Code	First name	Family name	Email address	Role
cogan-700	GroupManager1	GroupManager1	gm1@cogan.eu	CFGROUPMANAGER
cogan-703	GroupManager2	GroupManager2	gm2@cogan.eu	CFGROUPMANAGER
cogan-701	User1	User1	u1@cogan.eu	CFUSER
cogan-702	User2	User2	u2@cogan.eu	CFUSER

Group manager can access the list of "managed" users

Selecting an existing user the detail menu will present a list of user management options: _View_, _Add_. Please note that the full list of user management options, including _Edit_, and _Delete_, is available only to privileged users of the Competency Tracker.

Reporting competences by user

It is possible to generate individual competence reports for each member of a managed group. This feature is available clicking on _Reporting_ > _By User_ in the main menu. Selecting a user in the master area of the page will show his/her individual competence report in the detail area. As elsewhere in the Competency Tracker, the group manager has access only to the information regarding his/her managed groups.


COGAN
COMPETENCY IN GEOTECHNICAL ANALYSIS
Lifelong Learning Programme
COGAN Educational Base
Reporting
Users
Groups
Welcome, GroupManager1
My details
About
Logout

Code	First name	Family name	Email address
cogan-700	GroupManager1	GroupManager1	gm1@cogan.eu
cogan-703	GroupManager2	GroupManager2	gm2@cogan.eu
cogan-701	User1	User1	u1@cogan.eu
cogan-702	User2	User2	u2@cogan.eu

INDIVIDUAL COGAN COMPETENCY REPORT

User:	**User1, User1**
Id:	**cogan-701**
Date issued:	**November 17, 2014**

TECHNICAL AREA

Code: **DNM**
Title: **Designing a numerical model for geotechnical analysis**

OVERALL COMPETENCY RECORD

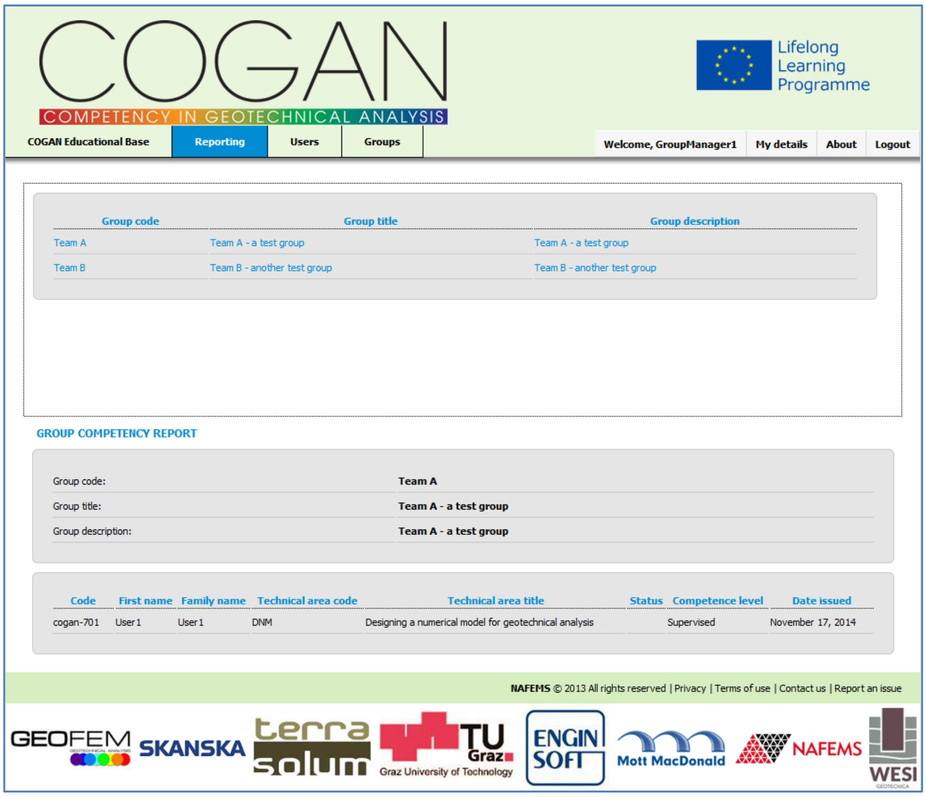
Status: **Achieved**
Achievement method: **Self evaluation**
Level: **Supervised**
Date: **11/17/14 12:00 AM**

PROGRESS CHART

Reporting competences by user

Reporting competences by group

Clicking on *Reporting* > *By Group* it is possible to generate a competence report for each managed group of users. This collective report will be displayed in the detail area of the page. Select a group in the master area: the technical area records of the members of the group are displayed in the detail area.


COGAN
COMPETENCY IN GEOTECHNICAL ANALYSIS
Lifelong Learning Programme
COGAN Educational Base
Reporting
Users
Groups
Welcome, GroupManager1
My details
About
Logout

Group code	Group title	Group description
Team A	Team A - a test group	Team A - a test group
Team B	Team B - another test group	Team B - another test group

GROUP COMPETENCY REPORT

Group code:	**Team A**
Group title:	**Team A - a test group**
Group description:	**Team A - a test group**

Code	First name	Family name	Technical area code	Technical area title	Status	Competence level	Date issued
cogan-701	User1	User1	DNM	Designing a numerical model for geotechnical analysis		Supervised	November 17, 2014

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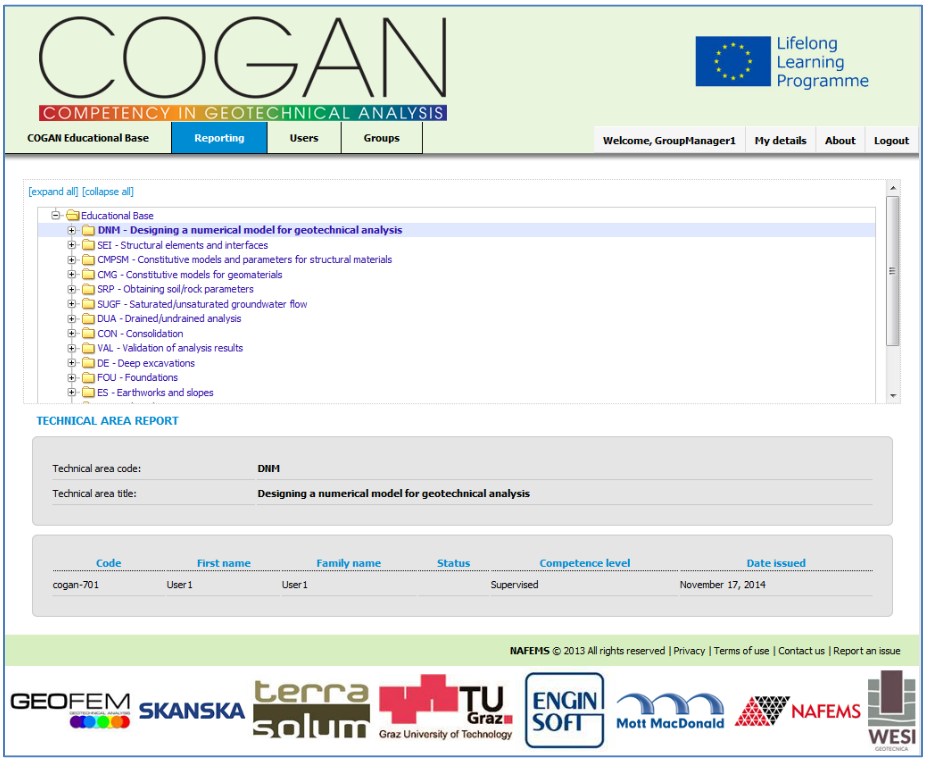
GEOFEM
SKANSKA
terra solum
TU Graz
Graz University of Technology
ENGIN SOFT
Mott MacDonald
NAFEMS
WESI

Reporting competences by group of users

Reporting competences by competence

It is possible to track the available competences by competence. To access this feature click on *Reporting* > *By Competence* in the main menu. The master area of the page will show the usual educational base tree. It is now possible to browse the tree and to select a Technical Area: the Competency Tracker will produce a report of the available competences for that area of competence. Similarly, it is possible to browse the tree and select a single competence statement: the Competency Tracker will produce a report of the available competences for that specific competence statement.


COGAN
COMPETENCY IN GEOTECHNICAL ANALYSIS
Lifelong Learning Programme
COGAN Educational Base
Reporting
Users
Groups
Welcome, GroupManager1
My details
About
Logout
[expand all] [collapse all]
GEOFEM
SKANSKA
terra solum
TU Graz
Graz University of Technology
ENGIN SOFT
Mott MacDonald
NAFEMS
WESI

- Educational Base
  - **DNM - Designing a numerical model for geotechnical analysis**
  - SEI - Structural elements and interfaces
  - CMPSM - Constitutive models and parameters for structural materials
  - CMG - Constitutive models for geomaterials
  - SRP - Obtaining soil/rock parameters
  - SUGF - Saturated/unsaturated groundwater flow
  - DUA - Drained/undrained analysis
  - CON - Consolidation
  - VAL - Validation of analysis results
  - DE - Deep excavations
  - FOU - Foundations
  - ES - Earthworks and slopes

TECHNICAL AREA REPORT

Technical area code:	**DNM**
Technical area title:	**Designing a numerical model for geotechnical analysis**

Code	First name	Family name	Status	Competence level	Date issued
cogan-701	User1	User1		Supervised	November 17, 2014

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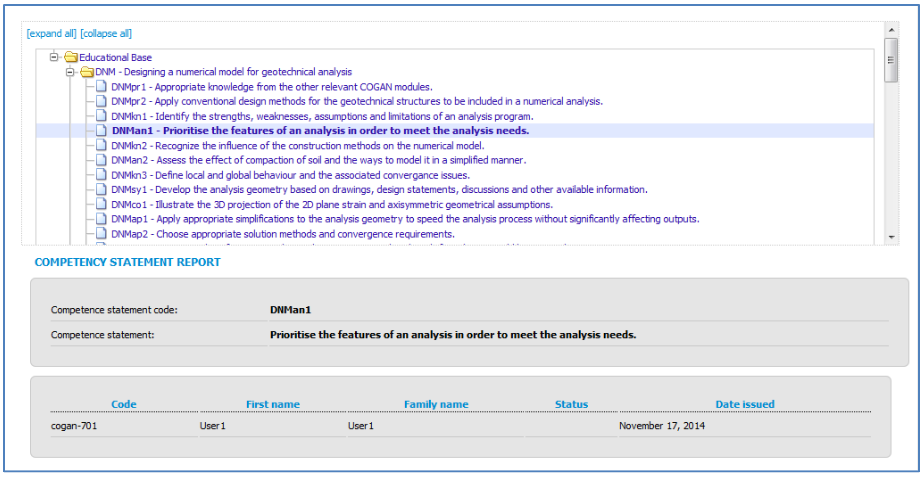
Reporting competences by competence: competence report for the selected Technical Area


[expand all] [collapse all]

- Educational Base
  - DNM - Designing a numerical model for geotechnical analysis
    - DNMpr1 - Appropriate knowledge from the other relevant COGAN modules.
    - DNMpr2 - Apply conventional design methods for the geotechnical structures to be included in a numerical analysis.
    - DNMkn1 - Identify the strengths, weaknesses, assumptions and limitations of an analysis program.
    - **DNMan1 - Prioritise the features of an analysis in order to meet the analysis needs.**
    - DNMkn2 - Recognize the influence of the construction methods on the numerical model.
    - DNMan2 - Assess the effect of compaction of soil and the ways to model it in a simplified manner.
    - DNMkn3 - Define local and global behaviour and the associated convergance issues.
    - DNMsy1 - Develop the analysis geometry based on drawings, design statements, discussions and other available information.
    - DNMco1 - Illustrate the 3D projection of the 2D plane strain and axisymmetric geometrical assumptions.
    - DNMap1 - Apply appropriate simplifications to the analysis geometry to speed the analysis process without significantly affecting outputs.
    - DNMap2 - Choose appropriate solution methods and convergence requirements.

COMPETENCY STATEMENT REPORT

Competence statement code:	**DNMan1**
Competence statement:	**Prioritise the features of an analysis in order to meet the analysis needs.**

Code	First name	Family name	Status	Date issued
cogan-701	User1	User1		November 17, 2014

Competence report for the selected competence statement

Annexes

Appendix A – Competency Tracker security features

Introduction

The Competency Tracker has been designed in accordance to strict security requisites.

Competency Tracker base technologies

The base technologies for the Competency Tracker have been selected taking into account the security of each individual component. The Competency Tracker itself is written mostly in the Java language: this language possesses some advanced characteristics that make this environment ideal to handle complex programming projects in a secure way.

HTTP Secure connection (HTTPS) and SSL security certificate

The Competency Tracker makes use of the HTTP secure protocol for all the communication between the Client (the user browser) and the Server. This means that the information flowing from and to the Competency Tracker is encrypted before being sent over the Internet, making it difficult for an attacker to obtain passwords, usernames or other information. To provide the highest level of protection to the user data during the COGAN testing phase, an SSL certificate signed by a trusted registration authority has been purchased and installed on the www.psecompetencytracker.org server: this certificate guarantees that the user browser is really connected with the authenticated server, avoiding “man in the middle” or “eavesdropping” attacks.

User sign in information

Instead of using emails for user sign in, that can easily be guessed and that can provide unwanted information about the registered users, the Competency Tracker makes use of customisable “ids” as the public information part for the login process. Passwords are, by design, at least 8 characters long.

Password protection

Passwords are never saved into the Competency Tracker database. Instead, a hash is calculated and the original password is discarded. The administrator himself can’t recover a given user password: he/she can only change the password to a new one. To process passwords, the Competency Tracker makes use of a recursive salted SHA hashing algorithm, that is the most advanced hashing algorithm currently available. Getting a single password “collision” using a “brute force” attack will take several years of heavy computation. Moreover, hash tables cannot be used by an attacker because the salt is randomly generated and ever changing.

Database safety

The Competency Tracker database is fully transactional and relational. All operations on the database are enclosed into a database transaction that is either fully committed or rolled back. Furthermore, strict relational constraints have been applied to the database schema. The combined result is that it is extremely unlikely for the database to get into a not consistent state, even in case of software error or system failure.

SQL injection protection

By design, the Competency Tracker is protected against this security vulnerability. User input is never directly used to construct an SQL query, avoiding harmful security exploits.