

Moodle Basics – A User Guide

MARIUSZ GŁĄBOWSKI, JAKUB GRZELSKI,
KONRAD ŚNIATAŁA PAWEŁ ŚNIATAŁA, MICHAŁ WEISSENBERG

Introduction

This part of the book was developed as one of the main outputs of the **Cyber Security - Training Students and Scholars for the Challenges of Information and Communication Technologies in Research and Studies for Internationalisation (Cyber F-IT)** project. The authors aimed to bring together in one place the most important information on managing the various elements of the Moodle system. This part of the book was designed to facilitate the work of Moodle administrators (Part A) and teachers (Part B). Due to the different nature of the tasks and challenges faced by these groups, the document has been divided into dedicated parts.

Part A (User Guide for Admin) indicates the procedure for installing the Moodle service on a Linux Ubuntu distribution. This is followed by a list of the stages required to properly secure the entire service, create and manage users, and manage the server on which Moodle is running. The description as a whole allows administrators to be aware of all the tasks in each individual stage that lead to creating the Moodle platform and makes the implementation much more straightforward.

Part B (User Guide for Teachers) describes the most important areas of a teacher's daily work on the Moodle platform. The global management of the course template and its individual activities are presented. This allows the teacher to learn, step by step, about the administration of his/her course, the meaning of individual fields, and the possibilities of using various activities and resources. The first part describes the management of the course template, the choice of course views, and the settings for the entire course. This is followed by a discussion of the possibilities for managing individual topics within the course and a detailed description of all activities that can be added to the course and the procedure for adding them. The following section is devoted to the possibilities for creating student assessment. The types of questions that can be added to the course are described, corresponding examples, and a procedure for creating a test environment. The last section of Part B is devoted to backing the course up and restoring the course from an existing copy.

Part A

User Guide for Admin

1 Course Creation

This chapter describes the basic steps needed to create a Moodle on Ubuntu 20.04 Server.

1.1 Change Course Settings

Steps to install Moodle on Ubuntu 20.04 Server:

1. Connect to the server via SSH
2. Make sure that the server is up to date by using: `sudo apt update & sudo apt upgrade`
3. Install required MySQL and apache repositories: `sudo apt install apache2 MySQL-client MySQL-server PHP libapache2-mod-PHP`
4. Run secure MySQL installation: `sudo MySQL_secure_installation`. Remember to write down the password, you will need it in the next step

```
moodle@moodle:~$ sudo mysql_secure_installation
Securing the MySQL server deployment.
Connecting to MySQL using a blank password.

VALIDATE PASSWORD COMPONENT can be used to test passwords
and improve security. It checks the strength of password
and allows the users to set only those passwords which are
secure enough. Would you like to setup VALIDATE PASSWORD component?

Press y|Y for Yes, any other key for No: yes

There are three levels of password validation policy:

LOW      Length >= 8
MEDIUM  Length >= 8, numeric, mixed case, and special characters
STRONG  Length >= 8, numeric, mixed case, special characters and dictionary file

Please enter 0 = LOW, 1 = MEDIUM and 2 = STRONG: 2
Please set the password for root here.

New password:
Re-enter new password:

Estimated strength of the password: 100
Do you wish to continue with the password provided?(Press y|Y for Yes, any other key for No) : yes
By default, a MySQL installation has an anonymous user,
allowing anyone to log into MySQL without having to have
a user account created for them. This is intended only for
testing, and to make the installation go a bit smoother.
You should remove them before moving into a production
environment.

Remove anonymous users? (Press y|Y for Yes, any other key for No) : yes
Success.

Normally, root should only be allowed to connect from
'localhost'. This ensures that someone cannot guess at
the root password from the network.

Disallow root login remotely? (Press y|Y for Yes, any other key for No) : yes
Success.

By default, MySQL comes with a database named 'test' that
anyone can access. This is also intended only for testing,
and should be removed before moving into a production
environment.

Remove test database and access to it? (Press y|Y for Yes, any other key for No) : yes
- Dropping test database...
Success.
- Removing privileges on test database...
```

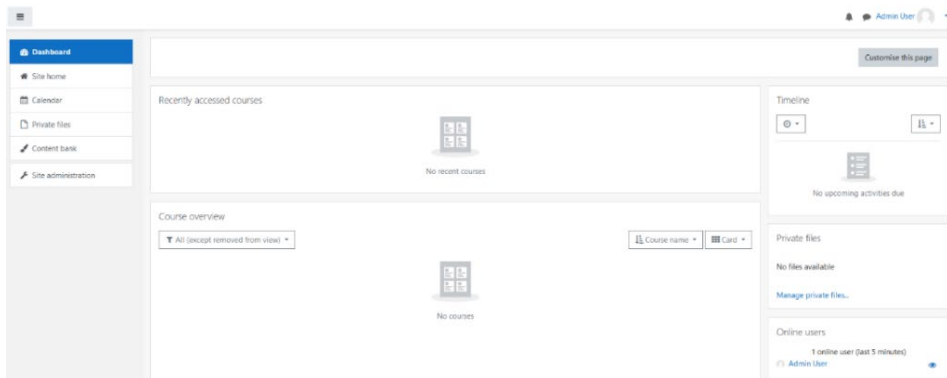
5. After installation, you will see the message: “All done!”
6. Install additional software: `sudo apt install graphviz aspell ghostscript clamav PHP7.4-pspell PHP7.4-curl PHP7.4-gd PHP7.4-intl PHP7.4-MySQL PHP7.4-xml PHP7.4-xmlrpc PHP7.4-ldap PHP7.4-zip PHP7.4-soap PHP7.4-mbstring`
7. Restart Apache so that the modules are loaded correctly: `sudo service apache2 restart`
8. Install Git because we will be using it to update Moodle: `sudo apt install git`
9. Change directory to /opt, we will put the Moodle core application code: `cd /opt`
10. Download Moodle code: `sudo git clone git://git.moodle.org/moodle.git`
11. Change directory to Moodle: `cd Moodle`
12. Retrieve a list of each branch available and tell git which branch to track or use: `sudo git branch -a; sudo git branch --track MOODLE_39_STABLE origin/MOODLE_39_STABLE`
13. Check Moodle version: `sudo git checkout MOODLE_39_STABLE`. You should see that branch is up to date
14. Copy the local repository to /var/www/html: `sudo cp -R /opt/moodle /var/www/html/`
15. Set proper permissions to files:
16. `sudo mkdir /var/moodledata`
17. `sudo chown -R www-data /var/moodledata`
18. `sudo chmod -R 777 /var/moodledata`
19. `sudo chmod -R 0755 /var/www/html/moodle`
20. Restart MySQL: `sudo service MySQL restart`
21. Create a database for Moodle and Moodle MySQL user. Use a password that you enter in d): `sudo MySQL -u root -p`
22. Create database: `CREATE DATABASE moodle DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_unicode_ci;`
23. Create a user and password where it says „moodledude” and „passwordformoodledude” you should change to the username and password of your choosing: `create user 'moodledude'@'localhost' IDENTIFIED BY 'passwordformoodledude';` Remember to use a strong password, another way you will be informed to use a stronger password
24. Set permission to user:
`GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, CREATE TEMPORARY TABLES, DROP, INDEX, ALTER ON moodle.* TO 'moodledude'@'localhost';`

25. Exit database: quit;
26. Temporarily make the webroot writable by `sudo chmod -R 777 /var/www/html/moodle`
27. Go to `http://IP.ADDRESS.OF.SERVER/moodle` in your web browser and finish the installation
28. Set the language to English and click on “Next”
29. Change from ‘/var/www/moodledata’ to ‘/var/moodledata’
30. Type set as: “Improved MySQL(native/MySQLi)”
31. Set a username and password like in 23. Other options set like on the screenshot:

Database host	<input type="text" value="localhost"/>
Database name	<input type="text" value="moodle"/>
Database user	<input type="text" value="moodledude"/>
Database password	<input type="text" value="zaq1@WSX123"/>
Tables prefix	<input type="text" value="mdl_"/>
Database port	<input type="text"/>
Unix socket	<input type="text"/>

[< Previous](#) [Next >](#)

32. Read and then accept conditions and click on “Continue”
33. Check if the server environment meets all minimum requirements.
34. Read installation summary, then click on “Continue”
35. Create a username and password for Moodle administrator. Set an email address and other optional fields. Then click on “Update profile”
36. Set Moodle Full site name, time zone, short name for the site, and no-replay address. Then click on “Save changes”
37. Now you can see Moodle dashboard



38. Set permission to file “config.PHP”: `sudo chmod -R 0755 /var/www/html/moodle`

1.2 Setting Password Policy for User

To set a password policy, follow these steps:

1. Go to “Site adm
2. inistration => Security => Site security settings”

At the bottom of the page, you will find password policy settings.

Set following variables:

- Password length: 8
- Digits: 1
- Lowercase letters: 1
- Uppercase letters: 1
- Non-alphanumeric characters: 1
- Log out after password change: Yes
- Remember username: optional

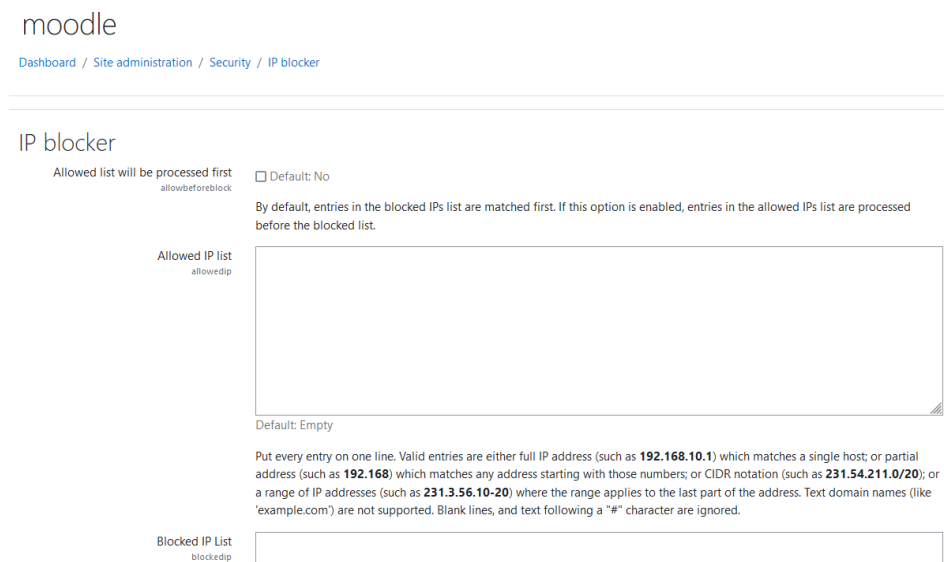
1.3 Register

The next step is to register your domain on Moodle.org, you will receive security messages. If you do not want to register your domain, you can follow security alerts on <http://moodle.org/security>.

2 Moodle Security

2.1 Securing Moodle From the Point of View of Network Addresses

If you know the IP address poll of your users, you can set a whitelist for IP addresses. Or the other way around, you can block addresses that should not have access to the Moodle website. You can do it in “Site administration => Security => IP blocker”.



The screenshot shows the Moodle IP blocker configuration page. At the top, there is a breadcrumb trail: [Dashboard](#) / [Site administration](#) / [Security](#) / [IP blocker](#). The main heading is "IP blocker". Below this, there are two main sections: "Allowed list" and "Blocked IP List".

The "Allowed list" section has a checkbox labeled "Default: No" for the option "Allowed list will be processed first" (allowbeforeblock). Below this is a text area for "Allowed IP list" (alloweditip) with a "Default: Empty" label. A note explains: "By default, entries in the blocked IPs list are matched first. If this option is enabled, entries in the allowed IPs list are processed before the blocked list." Below the text area is a detailed instruction: "Put every entry on one line. Valid entries are either full IP address (such as 192.168.10.1) which matches a single host; or partial address (such as 192.168) which matches any address starting with those numbers; or CIDR notation (such as 231.54.211.0/20); or a range of IP addresses (such as 231.3.56.10-20) where the range applies to the last part of the address. Text domain names (like 'example.com') are not supported. Blank lines, and text following a '#' character are ignored."

The "Blocked IP List" section has a text area for "Blocked IP List" (blockeditip).

2.2 Notification of Excessive Number of Password Attempts

Enable security notification in “Site administration => security => notification”. You will be notified if there are too many password attempts which may indicate a brute force attack.

moodle

Dashboard / Site administration / Security / Notifications

Notifications

Display login failures
displayloginfailures Default: No

This will display information to users about previous failed logins.

Email login failures to
notifyloginfailures

Default: Nobody

Send login failure notification messages to these selected users. This requires an internal logstore (eg Standard Logstore) to be enabled.

Threshold for email notifications
notifyloginthreshold Default: 10

If notifications about failed logins are active, how many failed login attempts by one user or one IP address is it worth notifying about?

- Display login failures: Yes
- Email login failures to <choose your username>
- The threshold to email notification: 10

2.3 HTTPS Security

Settings of HTTP security are in “Site administration => Security => HTTP security”. These settings should stay as they are by default.

Moodle

Dashboard / Site administration / Security / HTTP security

HTTP security

Secure cookies only
cookiesecure Default: Yes

If server is accepting only https connections it is recommended to enable sending of secure cookies. If enabled please make sure that web server is not accepting http:// or set up permanent redirection to https:// address and ideally send HSTS headers. When wwwroot address does not start with https:// this setting is ignored.

Only http cookies
cookiehttponly Default: No

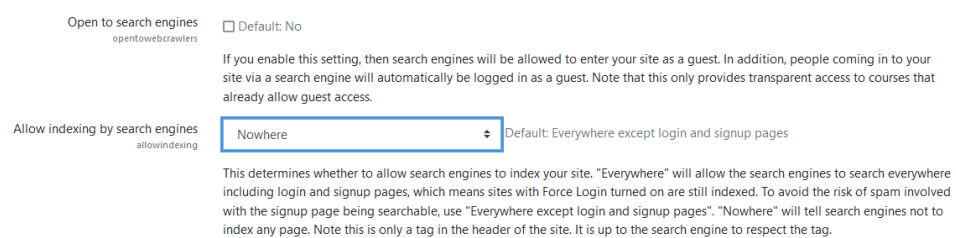
Enables new PHP 5.2.0 feature - browsers are instructed to send cookie with real http requests only, cookies should not be accessible by scripting languages. This is not supported in all browsers and it may not be fully compatible with current code. It helps to prevent some types of XSS attacks.

Allow frame embedding
allowframembedding Default: No

If enabled, this site may be embedded in a frame in a remote system, as recommended when using the 'Publish as LTI tool' enrolment plugin. Otherwise, it is recommended to leave frame embedding disabled for security reasons. Please note that for the mobile app this setting is ignored and frame embedding is always allowed.

2.4 Allow Indexing by Search Engines.

To allow indexing by search engines, you need to open – “Site administration => Security => Site security settings”.



The screenshot shows the 'Site security settings' page in Moodle. It features two main settings:

- Open to search engines** (opentowebcrawlers): A checkbox labeled 'Default: No' is currently unchecked.
- Allow indexing by search engines** (allowindexing): A dropdown menu is set to 'Nowhere'. The default is 'Everywhere except login and signup pages'.

Below the dropdown, a detailed explanation states: 'This determines whether to allow search engines to index your site. "Everywhere" will allow the search engines to search everywhere including login and signup pages, which means sites with Force Login turned on are still indexed. To avoid the risk of spam involved with the signup page being searchable, use "Everywhere except login and signup pages". "Nowhere" will tell search engines not to index any page. Note this is only a tag in the header of the site. It is up to the search engine to respect the tag.'

Option “Allow indexing by search engines” should be set as “Nowhere”.

2.5 Configure LDAP Authentication.

To integrate Lightweight Directory Access Protocol (LDAP) accounts with Moodle go to “Site administration => Plugins => Authentication => LDAP server”. LDAP defines a standard method for accessing and updating information in a local or remote directory (database) in the case of a client/server model. The protocol is optimised for reading, browsing and searching directories.

To configure LDAP authentication, you have to set:

1. Host URL – specify LDAP hostname or IP address
2. Distinguished name - If you want to use bind-user to search users. For example 'cn=ldapuser,ou=public,o=org'
3. Password: password to LDAP server
4. User type: Depended on LDAP settings
5. Context: List of contexts where users are located
6. Search subcontext: Yes
7. User attribute: Overrides the attribute used to name/search users. Usually, 'cn'
8. The rest of the fields can be left as they are by default. For., Data mapping (First name)” use „givenName”, „Data mapping (Surname)” – „sn”, „Data mapping (E-mail)” – „mail”

9. Now you can save settings by clicking on “Save changes” and then test settings by clicking on “Test settings”
10. To import users go to “Site administration => Server => Tasks => Scheduled tasks”. Find “LDAP users sync job”. Set the time when Moodle will synchronize users with LDAP. Also, you can run synchronisation manually from the server CLI (Command-Line Interface).

Moodle

[Dashboard](#) / [Site administration](#) / [Plugins](#) / [Authentication](#) / [Manage authentication](#)

Test authentication settings - LDAP server

Connecting to your LDAP server was successful

×

Continue

2.6 Support Contact

To set support contact information, go to “Site administration => Server => Support contact”. There is the possibility to set up a support email address and designate a special user responsible for support.

2.7 Secure Session

To secure sessions and limit the use of server resources, set a limit for the user session. You can do it in “Site administration => Server => Session handling”.

2.8 Efficiency

To increase efficiency, you can allocate more memory to physical resources on your server. The default value is set to 512MB. You can change it at “Site administration => Server => Performance”.

2.9 Notifications

By default, notifications about upgrades are on, and you should leave it as it is.

2.10 Quiz Hardening

Quiz hardening – limit access to quizzes with a password. To enable the option to set a password on a quiz, go to “Site administration => Plugins => Activity modules => Quiz” and enable “Require password”.

Quiz hardening – randomise question answers order. The default value of “Shuffle within questions” is enabled and can be changed in “Site administration => Plugins => Activity modules => Quiz”.

2.11 Brute Force Mitigation

The built-in mitigation to the brute force is located in “Site administration => Security => Site security settings => Account lockout threshold”. Here, we can set a threshold of the number of failed login attempts that result in account lockout. These settings should be considered because the attacker can lock the account and consequently prevent access to the actual account owners.

2.12 XSS/XSRF Mitigation

XSS consists of injecting malicious code into a web form or web address in order to perform a given operation. So there is a special function that can clean input data. This function can be enabled in “config.PHP” file on your server.

2.13 SQL Injection Mitigation

Changing settings relating to Structured Query Language (SQL) Injection attacks is impossible. The only mitigation is in the source code of Moodle, which cannot be edited. So, it is important to keep Moodle up to date.

2.14 Server Hardening

On the server which is running Moodle, only necessary services should be running. Useful tools to audit the server can be “Tiger” or “Lynis” (<https://github.com/CISOfy/lynis.git>). They can be used to generate a report about the machine.

2.15 Server Hardening – Local Firewall

The server should run a local firewall. The firewall should have ports needed for Moodle to function open properly. The necessary ports are 80, 443 (HTTP/HTTPS) and 9111 (chat). Example of access control list configuration:

```
sudo apt install iptables
sudo iptables -F
sudo iptables -A INPUT -i lo -j ACCEPT
sudo iptables -A OUTPUT -o lo -j ACCEPT
sudo iptables -A INPUT -m state --state ESTABLISHED, RELATED -j
ACCEPT
sudo iptables -A INPUT -p tcp --dport 22 -j ACCEPT
sudo iptables -A INPUT -p tcp --dport 80 -j ACCEPT
sudo iptables -A INPUT -p tcp --dport 443 -j ACCEPT
sudo iptables -A INPUT -p tcp --dport 9111 -j ACCEPT
```

To check settings, use:

```
sudo iptables -nL
```

And at the end, add a policy to drop anything else:

```
sudo iptables -P INPUT DROP
```

2.16 Logs Storage

Logs stored locally are located in “Site administration => Reports => Logs”. Logs can be filtered by participants/days/activities/actions sources/events. Logs are also stored in course backups if the proper option was chosen. Logs can also be exported to an external system, where they can be stored and analysed. Logs from Moodle and the server should be stored on a separate server. This can be done with “rsyslog”. Installation and configuration:

```
sudo apt install rsyslog
sudo systemctl start syslog
sudo vi /etc/rsyslog.conf
```


Then add the following line to the file:

```
*.*@@<adres_IP_serwera_syslog>:514
```

Now save the file and restart rsyslog:

```
sudo service rsyslog restart
```

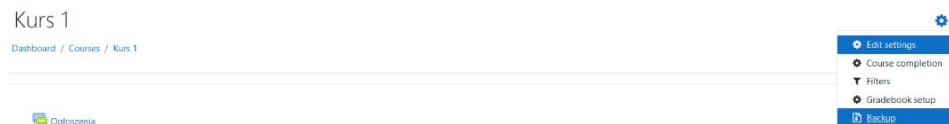
2.17 Logs Storage

The administrator can set verification of the age and location of the user by enabling the options in “Site administration => Users => Privacy and policies => Privacy settings”. By default, these settings allow you to configure the website according to the rules of the GDPR, allowing verification of the age of users. These settings should align with local policy (see Section “Privacy Settings”). It is also possible to enable/disable the display of a summary of stored private data. Next, in “Site administration => Users => Privacy and policies => Policy settings,” we can add URL to the data storage regulations, the website policy guide. In the “Site administration => Users => Privacy and policies => Plugin privacy registry”, there is a summary of the data collected by plugins installed on the platform. In “Site administration => Users => Permissions => User policies”, the administrator can change the visibility of profile elements of users.

3 Backup, Restore and Update

3.1 Creating a Backup Copy of a Course – Manual Mode

To create a manual backup copy of a course, you need to choose the course, click on the “gear” icon, and choose “backup”.



You will be redirected to a page with backup settings. There you can choose what data will be stored in the backup. You can jump to the final step or go for the next settings. On the second page, there are schema settings. In the third step, you can see a review of chosen settings and change the backup's filename. To finalfinalisebackup, click on "Perform backup". You should see the message "The backup file was successfully created." After this process, you can download the backup file and store it in a secure location.

3.2 Creating a Backup Copy of a Course – Automatic Mode

An automated backup schedule can be set in "Site administration => Courses => Backups => Automated backup setup."

Moodle

[Dashboard](#) / [Site administration](#) / [Courses](#) / [Backups](#) / [Automated backup setup](#)

Automated backup setup

Active
backup | backup_auto_active

Enabled Default: Disabled

Choose whether or not to do automated backups. If manual is selected automated backups will be possible only by through the automated backups CLI script. This can be done either manually on the command line or through cron.

Schedule
backup | backup_auto_weekdays

Sunday
 Monday
 Tuesday
 Wednesday
 Thursday
 Friday
 Saturday

Default: None

Choose which days of the week to perform automated backups.

Execute at
backup | backup_auto_hour

0 : 0 Default: 0:0

Choose what time automated backups should run at.

Automated backup storage
backup | backup_auto_storage

Course backup filearea Default: Course backup filearea

- Active: Enabled
- Schedule: Saturday (Copy should be performed when the server is not busy. Running the backup tool over all the courses can be processor-intensive, so you should not run it when there are many students on the server.)
- Execute at 00:00
- Automated backup storage: Course backup file area. Backups should also be stored on another server in case of failure.

- Maximum number of backups kept: 10
- Delete backups older than: depends on administrator choice
- Skip courses not modified since: 30 days

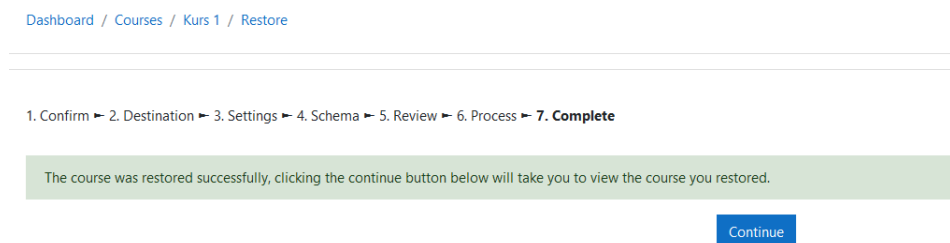
3.3 Course Restore – Manual Mode

To restore course data, you need to go to the chosen course, click on the “gear” icon, and then “restore”.



The course can be restored from a backup file stored on Moodle or from an external file.

After selecting the file, you will see a page with a summary. If the copy is correctly restored, you will see “The course was restored successfully, clicking the continue button below will take you to view the course you restored.”



3.4 Moodle Upgrade – Backup Important Data

Important data:

- Moodle software (everything in server/htdocs/moodle)
- Moodle uploaded files (server/moodledata)
- Moodle database (your Postgres or MySQL database dump)

- `cp moodle moodle.backup`
- `mv moodledata moodledata.backup`
- `MySQLdump -u username -p -C -Q -e -a moodle > moodle-backup.sql`

Put your site into maintenance mode to stop any non-administrator user from logging in. Then wait for any currently running cron processes to complete before proceeding.

Moodle

[Dashboard](#) / [Site administration](#) / [Server](#) / [Maintenance mode](#)

Maintenance mode

Maintenance mode
maintenance_enabled

Enable (Default: Disable)

Disable and other work

Optional maintenance message
maintenance_message

Default: Empty

Save changes

Check the requirements “Site administration => Server => Environment”

Moodle

[Dashboard](#) / [Site administration](#) / [Server](#) / [Environment](#)

[Update component](#)

Environment

Check how your server suits current and future installation requirements

Moodle version

Server checks

Name	Information	Report	Plugin	Status
moodle		❗ version 3.5 is required and you are running 3.9.9 (Build: 20210729)		OK
unicode		❗ must be installed and enabled		OK
database	mysql (8.0.26-0ubuntu0.20.04.2)	❗ version 5.6 is required and you are running 8.0.26.0.0.20.04.2		OK
php		❗ version 7.2.0 is required and you are running 7.4.3		OK
pcreunicode		❗ should be installed and enabled for best results		OK
php_extension	iconv	❗ must be installed and enabled		OK
php_extension	mbstring	❗ must be installed and enabled		OK

Download new files from Moodle and then unpack them:

```
tar xvzf moodle-1.1.tgz
```

Then copy the file:

```
cp moodle.backup/config.PHP moodle
cp -pr moodle.backup/theme/mytheme moodle/theme/mytheme
```

Now disable maintenance mode for everybody to be able to reaccess the Moodle.






























4 User Account Settings

4.1 Role Settings

Default roles and their permissions are in “Site administration => Users => Permissions => Define roles”.

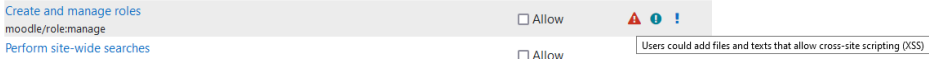
Moodle

[Dashboard](#) / [Site administration](#) / [Users](#) / [Permissions](#) / [Define roles](#)

Role 	Description	Short name	Edit				
Manage roles	Allow role assignments	Allow role overrides	Allow role switches	Allow role to view			
Manager	Managers can access courses and modify them, but usually do not participate in them.	manager	  				
Course creator	Course creators can create new courses.	coursecreator	   				
Teacher	Teachers can do anything within a course, including changing the activities and grading students.	editingteacher	   				
Non-editing teacher	Non-editing teachers can teach in courses and grade students, but may not alter activities.	teacher	   				
Student	Students generally have fewer privileges within a course.	student	   				
Guest	Guests have minimal privileges and usually can not enter text anywhere.	guest	  				
Authenticated user	All logged in users.	user	  				
Authenticated user on frontpage	All logged in users in the frontpage course.	frontpage	  				

[Add a new role](#)

Here you can create a role or edit an existing role. To edit the role, click on the “gear” icon on the right side. The roles and permissions should have been matched to the platform and users. If a permission is dangerous, there will be a red triangle on the right side with a description.



The granted rights should be set as low as possible while still allowing users to perform their tasks and properly use the platform.

4.2 Privacy Settings

Privacy settings are located in “Site administration => Users => Privacy settings”, and these are variables responsible for user privacy. By default, settings are customized to the chosen location. This means that when a new user selects the 'Create new account' button, they will be asked to enter their age and the country they are from.

Moodle

[Dashboard](#) / [Site administration](#) / [Users](#) / [Privacy and policies](#) / [Privacy settings](#)

Privacy settings

Digital age of consent verification
agedigitalconsentverification

No

Default: No

4.3 Authentication









Users can log in to the platform using local accounts created on the server or external authentication servers, such as the LDAP server. In “Site administration => Plugins => Authentication => Manage authentication” administrator can connect the external server to Moodle.

Moodle

[Dashboard](#) / [Site administration](#) / [Plugins](#) / [Authentication](#) / [Manage authentication](#)

Manage authentication

Available authentication plugins

Name	Users	Enable	Up/Down	Settings	Test settings	Uninstall
Manual accounts	3			Settings		
No login	0					
Email-based self-registration	0			Settings		Uninstall
CAS server (SSO)	0			Settings	Test settings	Uninstall
External database	0			Settings	Test settings	Uninstall
LDAP server	0			Settings	Test settings	
LTI	0					Uninstall
MNet authentication	0			Settings	Test settings	
No authentication	0			Settings		Uninstall
OAuth 2	0			Settings		Uninstall

To activate the pre-installed plugin, we need to first configure it by clicking on “Settings” and then try it by clicking on “Test settings”. If the test passes, we can enable the configuration by clicking on the “eye” icon.

4.4 Permission Summary

To display permissions of users go to “Site administration => Users => Accounts => Browse list of users”.

Moodle

Dashboard / Site administration / Users / Accounts / Browse list of users

2 Users

New filter

User full name

Show more...

Add filter

First name / Surname	Email address	City/town	Country	Last access	Edit
Admin Uzytkownik	jakub.			9 secs	
Jan Kowalski	jan.l			Never	

Add a new user

Users can be filtered by various filters, that are hidden under “Show more”. This way, accounts can be modified or removed from the platform. Only trusted administrators should have permissions to browsers users' accounts and modify or remove them.

4.5 Role For All Users

Under “Site administration => Users => Permissions => User policies”, it is possible to define default role for all users.

Moodle

Dashboard / Site administration / Users / Permissions / User policies

User policies

Role for visitors Default: Guest (guest)

Users who are not logged in to the site will be treated as if they have this role granted to them at the site context. Guest is almost always what you want here, but you might want to create roles that are less or more restrictive. Things like creating posts still require the user to log in properly.

Role for guest Default: Guest (guest)

This role is automatically assigned to the guest user. It is also temporarily assigned to not enrolled users that enter the course via guest enrolment plugin.

Default role for all users Default: Authenticated user (user)

All logged in users will be given the capabilities of the role you specify here, at the site level, in ADDITION to any other roles they may have been given. The default is the Authenticated user role. Note that this will not conflict with other roles they have unless you prohibit capabilities, it just ensures that all users have capabilities that are not assignable at the course level (eg post blog entries, manage own calendar, etc).

Creators' role in new courses Default: Teacher (editingteacher)

If the user does not already have the permission to manage the new course, the user is automatically enrolled using this role.

Restorers' role in courses Default: Teacher (editingteacher)

If the user does not already have the permission to manage the newly restored course, the user is automatically assigned this role and enrolled if necessary. Select "None" if you do not want restorers to be able to manage every restored course.

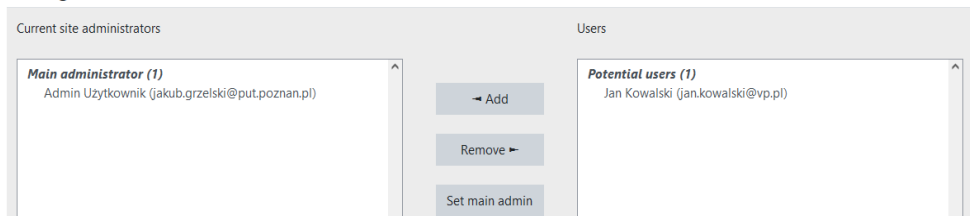
4.6 Adding Administrator

To add another administrator of Moodle go to “Site administrator => Users => Permissions => Site administrators”. In GUI we can add or remove administrators.

Moodle

[Dashboard](#) / [Site administration](#) / [Users](#) / [Permissions](#) / [Site administrators](#)

Manage site administrators



5 Server Settings

5.1 Developer and Testing Environment

The test environment should be an exact copy of the production site. It allows to test changes and evaluate platform behaviour. The administrator will be able to check the impact of changes on the server. The test environment should be accessible only from the internal network, with no access from the outside world, and isolated from the production server. The version of the development environment software should be the same as the version on the production server with the same config and plugins. Every change should be first tested on the development server. Testing the server is essential for continuous integration. After the test and positive results, the changes can be implemented on the production server.

5.2 Health Monitoring of the Server

Continuous monitoring of the server will allow you to notice irregularities in the work of the server. The server can be monitored by SNMP or special agents installed on the server. Health data collected by the monitoring server can be automatically

processed. Due to this, if the threshold is exceeded or events specified by the administrator occur, the administrator will be informed about the server state changes. Such events can be running out of disk space, CPU overheating, or loading on the network link to the server. Systems such as LibreNMS or Zabbix allow you to configure your triggers. Thanks to the long-term analysis of data collected by the system, the administrator will be able to configure alarms for events occurring in a server environment. If the trigger is activated, the action can be an e-mail or SMS. Active monitoring of the server's health can alert you about the strange behaviour of the server. It may mean that an unauthorized user has access to the server.

5.3 Automatic Vulnerability Search on the Server

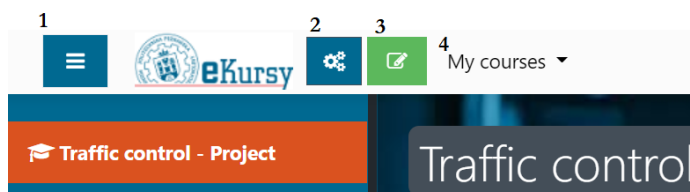
Opensource tools allow you to test the platform. Tools like “BurpSuite” can easily test the impact of attacks on path traversal, XSS, SQL Injection, XSFR, SSRF.

Part B

User Guide for Teachers

1 Course Homepage

The most important navigation elements on the course page:



1. List - access to the side panel
2. Gears - access to course management
3. Notepad - course editing mode
4. My courses - a list of the user's currently active courses

2 Course Creation.

This chapter describes the basic steps needed to create a course and how you can modify course elements, and how they affect the course, and how it is delivered.

2.1 Change Course Settings

This section covers the basic changes you can make to your course settings. To make changes, go to the subpage that allows you to change the course settings, available in the course settings panel.

2.1.1 Course Name

The name of the course should reflect the subject of the course. It is visible to users on the list of courses in which they participate and in the appropriate course category in the form of a link and in the navigation panel tab. After entering a given course, it is also displayed in the title bar of the web browser.

To rename a course, follow these steps:

1. Enable access to course management ("gears")
2. In the Course Settings pane, select Change Course Settings
3. In the "Full Course Name" field at the top of the page, enter a name for the course
4. Scroll to the bottom of the page and click on the Save and Display button

2.1.2 Course Visibility

Specify whether the course is to be visible to students after entering the appropriate subcategory and whether enrolled students are to see their course in their navigation panel. By default, a newly created course remains in the hidden state.

In a hidden state, the course remains visible to the course author and teachers assigned to it, and to people with administrative privileges. While it is hidden, students cannot access or see the course in the navigation pane even after they enrol in it.

To hide/show a course, follow these steps:

1. Enable access to course management ("gears")
2. In the Course Settings panel, select Change Course Settings
3. In the "Course Visibility" field, select the assumed option from the drop-down menu
4. Scroll to the bottom of the page and click on the Save and Display button

2.1.3 Course Format

Course format refers to the course layout. The course format can be set by following these steps:

1. Enable access to course management ("gears")
2. In the Course Settings pane, select Change Course Settings
3. In the "Course Format" pane, go to the "Format" drop-down menu and select one of the options
4. Scroll to the bottom of the page and click on the "Save and Display" button

There are several course formats, including:

- Weekly format - the format in which Moodle will create a separate section for each week of the course, including the dates in the header. The current week is automatically highlighted, and resources, activities can be placed in each section.
- Topics format (the default form of the course) - the format in which the course is divided into thematic sections with names specified by the teacher. Within each topic, you can include activities, resources and labels.
- Social format - a format focused on a social forum in which the facilitator can place any number of thematic discussions.
- Single activity format - the format in which the course is divided into only a single section in which the teacher can only place one activity.

Detailed descriptions are available at:

https://docs.moodle.org/310/en/Course_formats.

2.1.4 Course Start and End Date

The course start date affects how the course and logs are displayed, especially when selecting the weekly course format. The course end date is used to determine if the course should be included in your course list. After the end date has passed, the course is no longer displayed in the navigation block and is listed as past in the course overview on the student dashboards.

To set the start and end date of the course, follow these steps:

1. Enable access to course management ("gears")
2. In the Course Settings pane, select Change Course Settings
3. In the "General" panel, specify the start and end date of the course
4. Scroll to the bottom of the page and click on the Save and Display button

2.1.5 Course Description

The course description is divided into two sections: course summary and course image. To add a course description or image, follow these steps:

1. Enable access to course management ("gears")
2. In the Course Settings pane, select Change Course Settings
3. In the "Description" panel, complete the course summary and add a course image
4. Scroll to the bottom of the page and click on the Save and Display button

2.1.6 Course Summary

The summary will appear on the course list page. This field is searched when searching for a course and also appears in the course description block.

To add a course summary, follow these steps:

1. Enable access to course management ("gears")
2. In the Course Settings pane, select Change Course Setting
3. In the "Course Summary" panel, add a summary of the course
4. Scroll to the bottom of the page and click on the Save and Display button

2.1.7 Course Image

You can attach an image to your course summary. It will be available to anyone outside the course, as will the course name and summary. The course image is displayed as an icon in the list of available courses.

To place a course image, follow these steps:

1. Enable access to course management ("gears")
2. In the Course Settings pane, select Change Course Settings
3. In the "Course Image" panel, place an image file in one of the accepted formats: .gif, .jpeg, .png.
4. Scroll to the bottom of the page and click on the Save and Display button

2.1.8 Files and Uploads

It allows you to specify the maximum file size that can be sent by a student within the course. In the Moodle distribution used within the Cyber F-IT project the default is 500 MB.

To change the settings for the uploaded file size, follow these steps:

1. Enable access to course management ("gears")
2. In the Course Settings pane, select Change Course Settings
3. In the "Files and Upload" panel, select the maximum size of the uploaded file from the drop-down menu
4. Scroll to the bottom of the page and click on the Save and Display button

2.1.9 Groups

It allows you to change the course settings to divide users into groups. To change these settings, follow these steps:

1. Enable access to course management ("gears")
2. In the Course Settings pane, select Change Course Settings
3. In the "Groups" panel, you can change the selected options (described below)
4. Scroll to the bottom of the page and click on the Save and Display button

2.1.10 Group mode

In this section, you can define group mode at the course level using the drop-down menu. The options are "No Groups", "Separate Groups", and "Visible Groups". The selected setting will be the default group mode for all activities defined in this course. The group setting can affect what users see in the attendee list and with whom they can interact in the activities.

If you select "No groups", no user subgroups are created within the course, and activities are assigned by default to all participants.

When selecting "Separate Groups" in the course, each of the created groups sees only its group.

On the other hand, when selecting "Visible groups", the participants work within their subgroups but can see other groups in read only mode.

2.2 Course Management

This chapter describes the basic ways to manage users. The focus will be on the possible ways of enrolling students and teachers in the course, their data, and course roles. In addition, it will show how to create groups and assign students to them, as well as filter students on the list of participants. Additionally, the methods of contacting students and reports on their activity in the course will be discussed.

2.2.1 Course Enrollment Methods

Within the Moodle platform, there are several basic methods of adding students to a course.

Changes to the enrolment methods can be made as follows:

1. Enable access to course management ("gears")
2. In the User links panel, select Enrolment Methods
3. In the "Add enrolment method" field, select one of the options described below from the drop-down list

Within the Moodle platform, you can add the following user enrollment methods:

- Manual Enrolment – manual registration of users allows the teacher to assign users to the course on their own. There are two ways to do this.
 - After entering the "Enrolment methods" section (see above), in the list of saving methods, we find "Manual enrolment", and then in the modify column, select the "Save users" option.

Recording methods

Name	Users	Up/Down	Modifykuj
Manual saving	70	↓	 
Self-enrolment (Student)	0	↑ ↓	 
Auto enrolment	0	↑	 

Add a save method

- After enabling access to course management, in the User links panel, select the Participants tab (also available in the side panel). Then select the "Enrol users" button.

Participants



- Self-enrolment – enables users to enrol by themselves for the course by entering the password entered by the course creator. It is possible to define the time during which the user is allowed to enrol and the maximum number of users who can enrol in the course.
 - Enter your name for the saving method (any name).
 - Enter the access key to be made available to students.
 - Define the default role after accessing with a specific key; the default role is a student (description of roles available in the "course roles" section).
 - Set the start and end date of the period in which students can enrol (in the absence of a date, the student may enrol in the course at any time).
- Cohort sync – you add a group of users to the course. It is intended for student groups, academic year, etc. To add users via a cohort, follow these steps:
 - After enabling access to course management, in the User links panel, select the Participants tab (also available in the side panel). Then select the "Save users" button and in the "Select", a cohort section, select one of the possible cohorts from the drop-down menu (the Moodle platform administrators on the university side deal with assigning cohorts to specific groups of subjects).

2.2.2 User Data

To obtain information about students enrolled in the course, go to the Users subpage.

To do this, follow these steps:

1. Enable access to course management ("gears").
2. In the User Link panel, select Users.

The following fields are visible on the list of users:

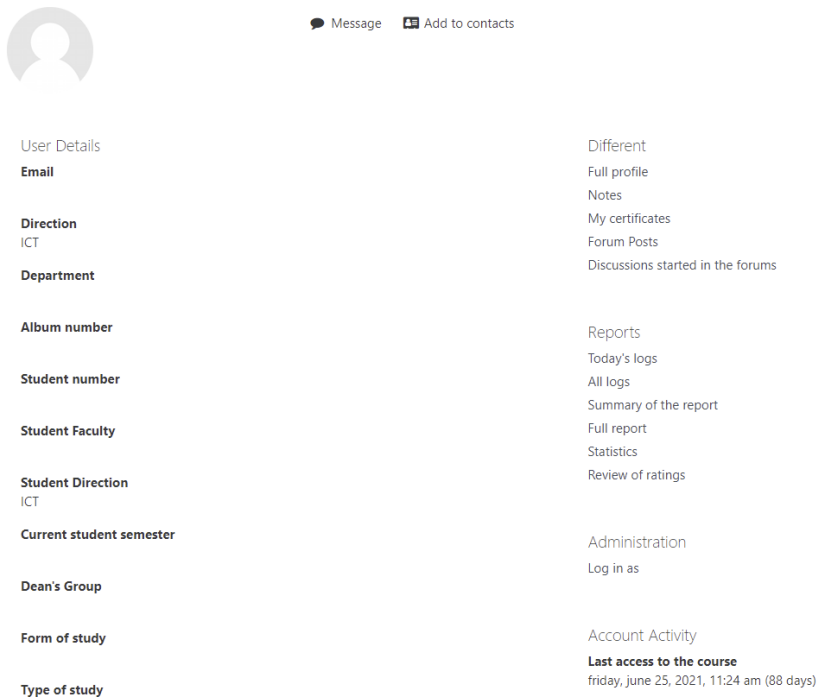
- First name and last name
- Student index number
- E-mail
- Faculty
- Field of study
- Role in the course (for a description of the roles, see the Course roles subsection)
- Information about belonging to a group
- Date of last access to the course - the last time the student accessed the course
- Status

<input type="checkbox"/>	Name / Surname	Album number	Email	Department	Direction	Roles	Group	Last access to the course	Status
<input type="checkbox"/>	Michael					Course Author, Instructor, Coordinator	No groups	39 sec.	Active
<input type="checkbox"/>	Michael				Communications Technologies	Student	No groups	Never	Active
<input type="checkbox"/>	Maciej				ICT	Student	No groups	88 days	Active

In addition, by clicking on the name and surname of a specific student, you can get additional information, such as:

- Form of study.

- Type of study.
- Semester.
- Dean's group.
- Access to the full student profile..
- Add notes to the student.
- View specific student forum entries within the course.
- View the discussions started by the student in the course.



Message Add to contacts

User Details

Email

Direction
ICT

Department

Album number

Student number

Student Faculty

Student Direction
ICT

Current student semester

Dean's Group

Form of study

Type of study

Different

Full profile

Notes

My certificates

Forum Posts

Discussions started in the forums

Reports

Today's logs

All logs

Summary of the report

Full report

Statistics

Review of ratings

Administration

Log in as

Account Activity

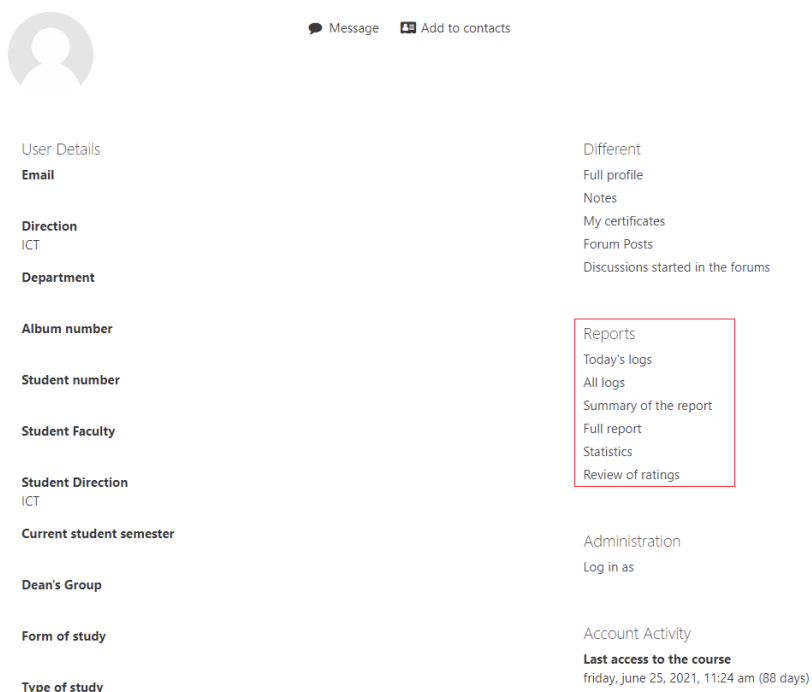
Last access to the course
friday, june 25, 2021, 11:24 am (88 days)

Additionally, it is possible to generate several reports. This is described in the next subchapter for the user.

2.2.3 User Reports

To obtain user reports, follow these steps:

1. Enable access to course management ("gears").
2. In the User Link panel, select Users.
3. Then click on the name and surname of a specific student. Select one of the reports to be generated.



The screenshot displays a user profile interface. At the top left is a placeholder for a user profile picture. To its right are two action buttons: 'Message' and 'Add to contacts'. Below the profile picture, the page is organized into two columns. The left column lists user details: 'User Details', 'Email', 'Direction' (ICT), 'Department', 'Album number', 'Student number', 'Student Faculty', 'Student Direction' (ICT), 'Current student semester', 'Dean's Group', 'Form of study', and 'Type of study'. The right column contains a list of options: 'Different', 'Full profile', 'Notes', 'My certificates', 'Forum Posts', 'Discussions started in the forums', 'Administration', and 'Log in as'. A red rectangular box highlights the 'Reports' section, which includes the following items: 'Today's logs', 'All logs', 'Summary of the report', 'Full report', 'Statistics', and 'Review of ratings'. At the bottom right, there is a section for 'Account Activity' with the text 'Last access to the course' followed by 'friday, june 25, 2021, 11:24 am (88 days)'.

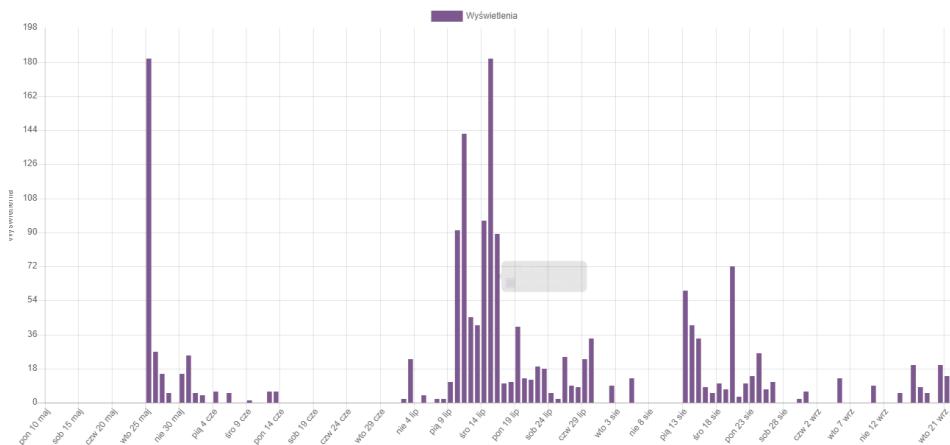
We can distinguish several types of reports:

- Today's logs - information about the user's activity on a given day within the course. The logs include:
 - Time - the exact date of the event.
 - Full name - name and surname of the student.
 - Applies to the user - in the case of an activity in the course, defines the activity to which the user has access.
 - Component - an activity to which the student has gained access.
 - Name of the event - the operation that the student performed in the activity.

- Description - a short description of the event.
- Source - definition of the browsing source, e.g., web in the case of a website.
- IP address - the address from which the access was obtained.

Time	Full name	Applies to the user	Event context	Ingredient	Event name	Description	Source	IP address
21 september 2021, 12:25	Michael	Michael	Course: Artificial Intelligence 2021	System	User profile displayed	The user with id '6701' viewed the profile for the user with id '6701' in the course with id '14444'.	web	

- All logs - information about users' activity within the course throughout its duration. It contains the same data as today's log report and activity graph.



- Report summary - information about the user's activity within specific topics, such as the number of views on individual activities, obtained ratings in the activities.

AI Course

- Announcements -
- Link to the list of courses 1 insights wednesday, june 2, 2021, 11:49 am (111 days)
- Consultation -
- Job fair 1 insights wednesday, june 2, 2021, 11:49 am (111 days)
- Courses in September - survey No response

Experimental data set

- Experimental Data Set -

Lab Guide

- Python Lab Guide -
- Machine Learning Lab Guide -
- Machine Learning - solution of tasks 1, 2 and 3 -

- Full report - an extension of the report summary with attached files, and comments about the tasks.
- Statistics - a collection of information about the number of views, entries, and all activities in the course, broken down by month.

End of period	Display	Entries	All activities
31 august 2021	184	30	214
31 july 2021	590	117	707
30 june 2021	12	0	12

2.2.4 Course Roles

In the course, we can define several basic roles that can be assigned to users:

- Site administrator - By default, the course administrator is authorized to perform all operations in the course.
- Course creator - can create and manage a course by adding users, blocks, and changes course settings. This role is often associated with the person teaching a given course. Still, it can also be assigned to the tutor of a given field of study or the curriculum coordinator.
- Teacher - by default, the teacher within the course has the right to add and change blocks within the course, add activities and users. Additionally, the teacher can change the role of users (in terms of students and teachers without editing rights).
- Non-editing teacher - has the right to view and rate student work but does not have the right to change or add new resources in the course. Additionally, you can restrict non-editing teacher access to specific groups within the course.
- Student – has the right to participate in the course and has access to the course resources but may not edit the course or view the grading log. You can also restrict student access to specific resources by their name, identification number (e.g., index number), specifically assigned group, etc.

2.2.5 Group Creation and Administration

Entering groups in a course allows you to filter actions and grades for specific user groups and grant non-editing access to teachers and students to specific activities, resources, and topic sections.

- Group levels
 - Course level - selecting this level assigns group mode as the default mode for all added activities within the course. To enable this level, follow the steps described in the Course Creation chapter, subchapter Change Course Settings - Groups.
 - Activity level - for each activity that supports group mode, it can be assigned independently. The assignment of group mode to a single activity has been described individually for each activity.

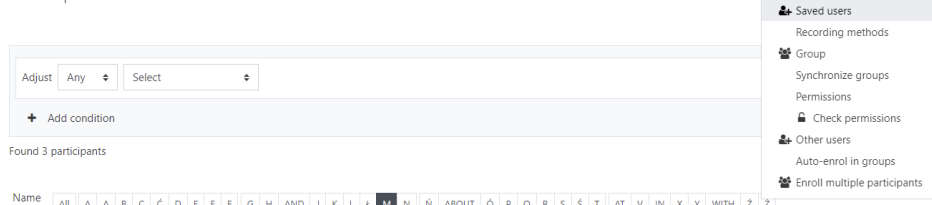
To create a new group, follow these steps:

1. Enable access to course management ("gears")
2. In the User Link panel, select Groups
3. Select Create Group

Another way to access groups is to follow these steps:

1. Enable access to course management ("gears")
2. In the User Link panel, select Users
3. Select the group field from the drop-down menu with additional options
4. Select Create Group

Participants



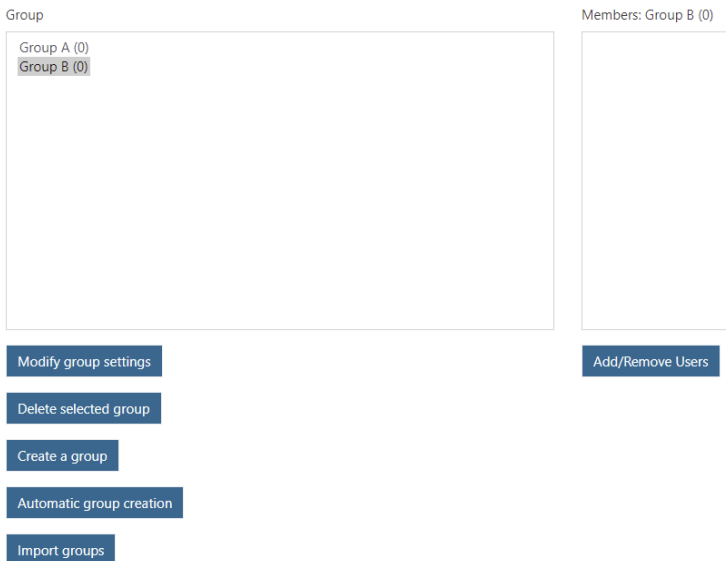
The screenshot shows the 'Participants' page in Moodle. At the top right, there is a gear icon for settings. Below it is a dropdown menu with the following options: Saved users, Recording methods, Group, Synchronize groups, Permissions, Check permissions, Other users, Auto-enrol in groups, and Enroll multiple participants. The main content area has a filter bar with 'Adjust' and 'Any' buttons, and a 'Select' dropdown menu. Below the filter bar is a '+ Add condition' button. The text 'Found 3 participants' is displayed. At the bottom, there is a table with a 'Name' column and a row of letters: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z.

When creating a group, you can specify, among other things, the following parameters:

- Group name - the name visible to the teacher in all activities for which group operations can be performed.
- Group information - optional information about the group
- Access key to the group in the case of individual registration by course participants.
- Messages to the group - It allows members of the group to send messages to other participants.

To add new users to the previously created group, follow these steps:

1. Enable access to course management ("gears")
2. In the User Link panel, select Groups
3. On the list of groups, select the group to which you want to add students
4. Then click on the Add / Remove Users button

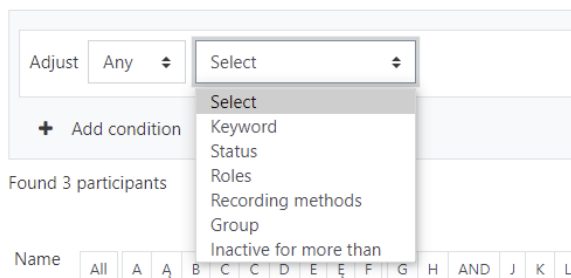


5. Select the student who is to be added to or removed from the group and select the appropriate button

2.2.6 Filtering the List of Users

To filter the user list, follow these steps:

1. Enable access to course management ("gears")
2. In the User Link panel, select Users
3. At the top of the page, select the filtering option:



3.1 In the first field, define how the filtering conditions must be met:

- None – no condition has to be met.
- Any – Any of the filtering conditions must be met.
- All – All of the filtering conditions must be met.

3.2 In the second field, define which filtering method should be used, you can choose from:

- Keyword - a keyword that must be in one of the columns with user information.
- Status - active/inactive.
- Roles - one of the roles described in the section "Course roles".
- Enrolment methods - manual/standalone.
- Groups - one of the groups created as part of the course.
- Inactive for longer than – the definition of days since the last student activity in the course.

2.2.7 Contact With Users

To send a message to a specific user, the following steps can be performed:

1. Enable access to course management ("gears")
2. In the User Link panel, select Users
3. Select the checkbox next to the student to whom the message is to be sent
4. At the bottom of the page, from the "With selected users" drop-down menu, select the "Send Message" option

To send the message to all users, you can follow these steps:

1. Enable access to course management ("gears")
2. In the User Link panel, select Users
3. Select all users on the list of users by checking the checkbox in front of the first and last name field, or using the button at the bottom of the page "Select all users"
4. At the bottom of the page, from the "With selected users" drop-down menu, select the "Send message" option

To send a message to a specific group of users, you can follow these steps:

1. Enable access to course management ("gears")
2. In the User Link panel, select Users
3. Filter users by groups and select a specific group following the instructions described in the section "Filtering the list of users"
4. Select all users on the list of users by checking the checkbox in front of the first and last name field, or using the button at the bottom of the page "Select all users"
5. At the bottom of the page, from the "With selected users" drop-down menu, select the "Send message" option





2.2.8 Activity Reports

The course activity report is available to the administrator, course creator, teacher, and teacher without editing rights. As part of the overall activity report, you can see the number of views for each activity and the resource within the course.

To generate an activity report:

1. Enable access to course management ("gears")
2. In the User Link panel, select View Course Activity Reports

Lab Guide

 Python Lab Guide	68 showing by 41 users	thursday, september 2, 2021, 3:02 pm (18 days 21 hours)
 Machine Learning Lab Guide	65 displayed by 32 users	thursday, september 2, 2021, 3:02 pm (18 days 21 hours)
 Machine Learning - solution of tasks 1, 2 and 3	91 showing by 38 users	thursday, september 2, 2021, 3:02 pm (18 days 21 hours)
 Machine Learning - solution of tasks 4, 5 and 6	27 showing by 19 users	thursday, september 2, 2021, 3:02 pm (18 days 21 hours)

It is also possible to generate a detailed report for each course participant. Information on the method of generating reports for individual users is included in the User Data subsection.

3 Topic Management

This chapter describes the basic mechanisms for managing topics within the course. The focus will be on creating the topic and managing its settings, as well as the activities and resources that can be placed inside the course.

3.1 Topic Editing

This section covers the basics of the topics for the courses on the platform. To add a new topic, please complete the following steps:

1. Access to the course editing mode ("notepad") must be enabled on the course website
2. At the bottom of the page, we find the "add topic"
3. We define the number of added topics in the "Number of sections" field

To edit a course, follow these steps:

1. Access to the course editing mode ("notepad") must be enabled
2. Next to the name of the course on the right, select the drop-down menu
3. We choose one of the options:

- Edit topic – switch to the topic editing mode.
- Highlight – the topic on the page is highlighted with a frame.
- Show topic/Hide topic – setting the visibility of the topic from the student's point of view.
- Delete Topic – delete the topic and all the activities created in it.

As part of editing a topic, you can perform the following actions:

- Post a topic - visible at the top of the section.
- Add an abstract - the description of the topic is visible under the topic name.
- Access limitation - you specify the activity availability only for individual users; you can choose from the following options:
 - Cohort - limited to a specific student cohort only..
 - Complete an Activity - require other activities to be completed before access.
 - Date - you define access only at a specific time.
 - Assessment - the requirement to obtain an appropriate grade (as a percentage) for another activity.
 - Password - requires a password to access the resource.
 - Roles - you define access based on the user's role in the course.
 - Restriction set - you specify a set of restrictions that must be met before being granted access.

In addition, within a specific topic, you can add activities and resources that are described in detail in the following subsections.

3.2 Forums and Chats

This section covers the basic community activities that can be added as part of the course.

As part of social activities, the following can be distinguished:

- Forum - the forum you add threads and comments, both for teachers and students. As part of the forum entries, multimedia files can be placed.
- Chat - This allows course participants to discuss in real time.

3.2.1 Forums

There are 5 types of forums within the moodle platform:

- Q&A forum - Instead of initiating a discussion, participants ask a question in the initial discussion post. Students may respond but will not see other Students' answers to a question in the discussion until they respond in the same discussion.
- Standard forum for general use - an open forum where anyone can start a new topic at any time; this is the best general-purpose forum.
- Everyone sends a discussion topic - each person can post exactly a new discussion topic (although anyone can reply to it); this is useful when you want each student to start a discussion on, say, their thoughts for the week, and everyone else to respond to them.
- Single Discussion - A single-page discussion of one topic that is useful for short, focused discussions (cannot be used with separate groups).
- Standard forum displayed like a blog.

To add a forum, follow these steps:

1. Access to the course editing mode ("notepad") must be enabled on the course website.
2. As part of the topic in which the forum is to be placed, click on "Add activity or resource".
3. In the list of activities, find a forum and then click on the activity icon.

Basic settings when creating a forum:

- Name - Define the name displayed on the course page.
- Description - optional additional description of the activity displayed on the course website.

- Type - you choose one of the options described above.
- Availability - allows you to set the availability time of the forum for students.
- Attachments and word counting - you specify the maximum size and number of attachments placed within the forum and specify whether words should be counted within forum posts.
- Subscription and observation - you define the method of subscribing and observing the forum. We can distinguish:
 - Subscription (in the case of subscribing to the forum, users receive an e-mail with content of any new posts on the forum):
 - Optional subscription - course participants can decide on their own to subscribe to the forum.
 - Force Subscription - All course participants are subscribed to the forum and cannot change it.
 - Automatic subscription - after creating a forum, all course participants are automatically assigned as subscribers to the forum; however, they can change it.
 - Subscription disabled - course participants cannot subscribe to the forum.
 - Observation (in the case of observation, participants have the option to see which posts on the forum they have not yet seen by highlighting them):
 - Optional - allow students to choose whether they want new messages to be highlighted.
 - Off - all new posts are automatically highlighted.
- Blocking - you define whether forum discussions should be blocked after a certain period with no new entries.
- The threshold for entries to be blocked.
- Grading - It is possible to define the types of attendance with points, scale, and none, which means no attendance scores. Additionally, you can assign attendance grades to the appropriate grade category and define the attendance credit threshold.
- Standard module options - you determine the availability (whether the activity should be visible to students), with an option of adding an ID number and a group mode in the case of many groups.

- Access limitation - you specify the activity availability only for individual users; you can choose from the following options:
 - Cohort - limited to a specific student cohort only.
 - Complete an Activity - require another activity to be completed before access.
 - Date - you define access only at a specific time.
 - Assessment - the requirement to obtain an appropriate grade (as a percentage) for another activity.
 - Password - requires a password to access the resource.
 - Roles - you define access based on the user's role in the course.
 - Restriction set - you specify a set of restrictions that must be met before being granted access.
- Activity Completion - you define how you track your completion and expectations for an activity by a deadline.

3.2.2 Chats

To add a chat, follow these steps:

1. Access to the course editing mode ("notepad") must be enabled on the course website
2. As part of the topic in which the forum is to be placed, click on "Add activity or resource"
3. In the list of activities, find a "chat" and then click on the activity icon

Basic settings when creating a chat:

- Name - Define the name displayed on the course page.
- Description - optional additional description of the activity displayed on the course website.
- Chat sessions - you define the following chat parameters:
 - Next chat time - you define the date of the next chat session; this date is automatically placed in the participant's calendar.

- Repeat/publish session times - allows you to schedule new chat sessions automatically; there are four options to choose from:
 - do not show session times - after selecting this option, the exact chat hours are not set, and chat users can use it for the entire duration of the course.
 - do not repeat - after selecting this option, only the time of the next meeting will be published in the form of a chat.
 - every day at the same time - when selected, the chat is scheduled every day at the same time.
 - weekly at the same time - when selected, the chat is scheduled at the same time every week.
- Keep past sessions - you define for how many days the chat record should be kept.
- Anyone can view past sessions - you specify whether all course participants can view the record of past chat sessions (teachers can always view past sessions, this setting applies to students).
- Standard module options - you determine the availability (whether the activity should be visible to students), optionally adding an id number and a group mode in the case of many groups.
- Access limitation - you specify the activity availability only for individual users; you can choose from the following options:
 - Cohort - limited to a specific student cohort only.
 - Complete an Activity - require another activity to be completed before access.
 - Date - you define access only at a specific time.
 - Assessment - the requirement to obtain an appropriate grade (as a percentage) for another activity.
 - Password - requires a password to access the resource.
 - Roles - you define access based on the user's role in the course.
 - Restriction set - you specify a set of restrictions that must be met before being granted access.
- Activity Completion - you define how you track your completion and expectations for an activity completion date.

3.3 Attendance

Attendance activity allows you to keep a list of student attendance during classes. It allows you to set class dates, assign appropriate groups to dates, etc.

To create an attendance activity, follow these steps:

1. Access to the course editing mode ("notepad") must be enabled on the course website
2. As part of the topic in which the forum is to be placed, click on "Add activity or resource"
3. In the list of activities, find the attendance and then click on the activity icon

Basic activity settings:

- Name - you define the name displayed on the course page.
- Description - optional additional description of the activity displayed on the course website.
- Grade - it is possible to define attendance grades in a point, scale, and none, which means no attendance scores. Additionally, you can assign attendance grades to the appropriate grade category and define the attendance credit threshold.
- Standard module options - you determine the availability (whether the activity should be visible to students), optionally adding an id number and a group mode in the case of many groups.
- Access limitation – you specify the activity availability only for individual users; you can choose from the following options:
 - Cohort - limited to a specific student cohort only.
 - Complete an Activity - requires another activity to be completed before access.
 - Date - you define access only at a specific time.
 - Assessment - the requirement to obtain an appropriate grade (as a percentage) for another activity.
 - Password - requires a password to access the resource.
 - Roles - you define access based on the user's role in the course.

- Restriction set - you specify a set of restrictions that must be met before being granted access.
- Activity Completion - you define how you track your completion and expectations for an activity completion date.

After creating the attendance activity, you get access to the activity panel. Inside the panel, the following options are available on specific tabs:

#	Date	Time	Type	Description	Actions
1	wed, 22 sep 2021	09 - 11	Group: TM18	Regular classes	▶ 🔍 🗑

- Sessions - access to the view of created sessions.
- Add session - you add a new session:
 - Session type - shared or group in case of creating groups in the course.
 - Session date - define the date of the meeting.
 - Time - meeting time.
 - Description - optional description.
 - Add multiple sessions - allows you to create multiple repeating sessions; it is especially useful for repeated activities.
 - Registration by the student - enabling the student to independently mark his or her presence in the tab.
- Report - reports for visible sessions.
- Export - allows you to export session information to a file in one of three formats (Excel (.xlsx), OpenOffice (.ods), text file (.txt)).
- Status set - you define the presence statuses and the points earned for them. By default, four statuses are set: P - present, L - late, E - excused, and A - absent. In addition, you can define the time during which a particular option is available to the student (e.g. specifying that attendance can only be checked for the first 5 minutes, then the late option is available). Additionally, you can choose an option set by default if the student selects no option.

3.4 Activities and Resources

This section describes the basic activities and resources to improve and enhance the quality of delivering courses for students.

3.4.1 Labels, Links, and Files

The section covers the basics of applying, placing, and editing labels, links, and files.

3.4.1.1 Labels

The label can be used to create the course structure and spacing within individual topics (a division of the topic into sections). As part of this course resource, the tutor has the option of both plain text and multimedia (images, audio/video recordings) and links. In particular, the job of the labels is to improve the appearance of the topic and separate sections.

To create a label inside a topic, follow these steps:

1. Access to the course editing mode ("notepad") must be enabled on the course website.
2. As part of the topic in which the forum is to be placed, click on "Add activity or resource."
3. In the list of activities, find the label and then click on the resource icon.

Basic resource settings:

- Label text - you enter the label text (text, multimedia, link) that will be displayed on the course page.
- Standard module options - you determine the availability (whether the activity should be visible to students), optionally adding an id number and a group mode in the case of many groups.
- Access limitation – you specify the activity availability only for individual users; you can choose from the following options:
 - Cohort - limited to a specific student cohort only.

- Complete an Activity - requires other activity to be completed before access.
- Date - you define access only at a specific time.
- Assessment - the requirement to obtain an appropriate grade (as a percentage) for another activity.
- Password - requires a password to access the resource.
- Roles - you define access based on the user's role in the course.
- Restriction set - you specify a set of restrictions that must be met before being granted access.

3.4.1.2 Links

The URL may be used as part of the course to provide course participants with a link to external resources that cannot be included in the course.

To add a link inside a topic, follow these steps:

1. Access to the course editing mode ("notepad") must be enabled on the course website.
2. Under the topic where the link is to be placed, click on "Add activity or resource."
3. In the list of activities, find the URL address and click on the resource icon.

Basic resource settings:

- Name - link name, text visible to course participants.
- External URL - www address to which the link should be redirected.
- Description - description of the link visible to course participants.
- Appearance - you define how the reference page should be displayed; there are four options:
 - Automatically.
 - Embedded - the referenced website is embedded within the Moodle platform, leaving the course header and blocks.

- Open - you are directly redirected to the website within the current browser tab.
- In the pop-up window – the website opens within a new browser window.
- Changing the URL address - transfers internal information from moodle course such as course data (id, course name, etc.), and user data (id, first name, e-mail, etc.) to the URL.
- Standard module options - you determine the availability (whether the activity should be visible to students), optionally adding an id number and a group mode in the case of many groups.
- Access limitation - you specify the activity availability only for individual users; you can choose from the following options:
 - Cohort - limited to a specific student cohort only.
 - Complete an Activity - requires another activity to be completed before access.
 - Date - you define access only at a specific time.
 - Assessment - the requirement to obtain an appropriate grade (as a percentage) for another activity.
 - Password - requires a password to access the resource.
 - Roles - you define access based on the user's role in the course.
 - Restriction set - you specify a set of restrictions that must be met before being granted access.
- Activity Completion - you define how you track your completion and expectations for an activity completion date.

3.4.1.3 Files

It allows you to upload files with any extension within the Moodle platform and place them in the course.

To add a file inside a topic, follow these steps:

1. Access to the course editing mode ("notepad") must be enabled on the course website.

2. Under the topic where the file is to be placed, click on "Add activity or resource."
3. In the list of activities, find the file and click on the resource icon.

Basic resource settings:

- Name - the name of the file, visible to course participants.
- Description - files description visible to course participants.
- Select file - sends a file through the activity window or in the form of drag and drop.
- Appearance - you specify how the file should be displayed on the course page, and additionally allows you to display the file size, type, and date of transfer; there are four options to choose from:
 - Automatically.
 - Embedded - the file is embedded within the Moodle platform, leaving the course header and blocks behind.
 - Force download - opens a file, it must be downloaded by the user.
 - Open - the file is opened under the current tab.
 - In a pop-up window - the file is opened in a new browser window.
- Standard module options - you determine the availability (whether the activity should be visible to students), optionally adding an id number and a group mode in the case of many groups.
- Access limitation - you specify the activity availability only for individual users; you can choose from the following options:
 - Cohort - limited to a specific student cohort only.
 - Complete an Activity - requires another activity to be completed before access.
 - Date - you define access only at a specific time.
 - Assessment - the requirement to obtain an appropriate grade (as a percentage) for another activity.
 - Password - requires a password to access the resource.
 - Roles - you define access based on the user's role in the course.
 - Restriction set - you specify a set of restrictions that must be met before being granted access.

- Activity Completion - you define how you track your completion and expectations for an activity completion date

3.4.2 Folders

The folder allows the teacher to add a directory in which he or she can then put files. A folder is useful if you need to transfer a large number of files or need to group them together.

To add a folder to a topic, follow these steps:

1. Access to the course editing mode ("notepad") must be enabled on the course website.
2. Under the topic in which the folder is to be placed, click on "Add activity or resource."
3. In the list of activities, find a folder and then click on the resource icon.

Basic resource settings:

- Name - the name of the file, visible to course participants.
- Description - file description visible to course participants.
- Content - allows you to upload files to the directory:
 - Files - allows you to transfer files to a directory; files can be uploaded independently or in the form of a single .zip file which can later be unpacked.
 - Display folder contents - allows you to set the way of displaying the folder contents. You can choose to display the contents on a new page or the course's main page. Additionally, you can select options such as show directory structure, show download folder button, and force download files.
- Standard module options - you determine the availability (whether the activity should be visible to students), optionally adding an id number and a group mode in the case of many groups.
- Access limitation - you specify the activity availability only for individual users; you can choose from the following options:

- Cohort - limited to a specific student cohort only.
 - Complete an Activity - requires another activity to be completed before access.
 - Date - you define access only at a specific time.
 - Assessment - the requirement to obtain an appropriate grade (as a percentage) for another activity.
 - Password - requires a password to access the resource.
 - Roles - you define access based on the user's role in the course.
 - Restriction set - you specify a set of restrictions that must be met before being granted access.
- Activity Completion - you define how you track your completion and expectations for an activity completion date.

3.4.3 Tasks

The task allows the teacher to collect students' work, evaluate them and comment on them. It is a very useful activity in which students can submit their works in the form of files of any type and a collection of files in a compressed format (e.g., zip, rar). The teacher can leave a comment or upload files as part of the answer.

To add a task inside a topic, follow these steps:

1. On the course website, you must enable access to the course editing mode ("notepad").
2. Under the topic where the task is to be placed, click "Add activity or resource."
3. In the list of activities, find a task and click on the resource icon.

Basic resource settings:

- Name - the name of the folder, visible to course participants.
- Description - description of the folder visible to course participants.
- Additional files - additional files visible to the course participants, e.g. the content of the task in the form of a pdf file.

- Availability - you determine the availability of the task for course participants:
 - Allow task submission ~~from~~ - you define the date from which students can submit their task solutions.
 - Deadline for submission - the deadline by which students must send their solutions to the tasks. If the task allows submission of work after this date, the task will be defined as late.
 - Deadline - the date after which students cannot submit solutions.
 - Remind me to evaluate - this is the date visible to the teacher in the cockpit and calendar, reminding me to check the solutions sent by the course participants.
- Types of tasks
 - Types of tasks - you define the form of submitting tasks; there are two options to choose from:
 - Online text and recording - students can post solutions using the HTML editor.
 - Word limit - defining the maximum number of words the student can send as part of the solution.
 - Uploaded files - students can upload solutions as uploaded files:
 - Maximum number of transferred files - you determine the maximum number of files that can be transferred by the student in the form of a solution.
 - Maximum size of the transferred file - the maximum size that the student can send the solution.
 - Accepted file types - you define what types of files can be sent by the student as part of solving the task.
- Types of feedback - you determine the form of the feedback given to the student by the teacher; four types can be distinguished:
 - Feedback - sends a feedback comment to the task posted by the student.

- PDF Annotation - allows PDF solutions to display them and add notes, drawings, and comments directly on the student's work.
- Off-line evaluation sheet - enables the teacher to download and send a sheet with student grades.
- Comments files - enables the teacher to send files with comments to the students.
- Group task settings - assigns a task to a specific group of students.
- Content - allows you to send files to the directory:
 - Files - sends files to a directory; files can be uploaded independently or in the form of one .zip file, which can later be unpacked.
 - Display folder contents - sets the method of displaying the folder contents; you can choose to display the contents on a new page or the course's main page. Additionally, you can select options such as show directory structure, show download folder button, and force download files.
- Standard module options - you determine the availability (whether the activity should be visible to students), optionally adding an id number and a group mode in the case of many groups.
- Access limitation - you specify the activity availability only for individual users; you can choose from the following options:
 - Cohort - limited to a specific student cohort only.
 - Complete an Activity - requires another activity to be completed before access.
 - Date - you define access only at a specific time.
 - Assessment - the requirement to obtain an appropriate grade (as a percentage) for another activity.
 - Password - requires a password to access the resource.
 - Roles - you define access based on the user's role in the course.
 - Restriction set - you specify a set of restrictions that must be met before being granted access.

3.4.4 Virtual Programming Lab

The Virtual Programming Lab (VPL) enables the teacher to collect programming work in many programming languages and present students' work in real time. This activity makes it possible to create programmes in almost any programming language, save a copy of the created programme and its compilation, debugging, and observing the results obtained.

To add a VPL inside a topic, follow these steps:

1. On the course website, you must enable access to the course editing mode ("notepad").
2. Under the topic in which the task is to be placed, click on "Add activity or resource."
3. In the list of activities, find the Virtual Programming Lab and then click on the resource icon.

Basic activity settings:

- Name - the name of the VPL, visible to course participants.
- Short description - short information about the VPL visible to participants.
- Description - description of the VPL visible to course participants.
- Work submission period - specify the period during which the activity will be available to course participants.
- Available from - you specify the date after which the activity will be available to course participants.
- End date - you specify the date after which the activity will cease to be available to course participants, which results in the impossibility of further editing the submitted works or sending new works.
- Restrictions on submitting works - you define restrictions on submitting works.
- Maximum number of files - the maximum number of files (programmes) that a course participant can upload or create.
- Uploading an external file, paste and drop external content - you specify whether a course participant should be able to upload a ready file with the

programme and also be able to copy content from an external file to a created file inside the VPL.

- Maximum file upload size - you define the maximum length of a course sent by a course participant.
- Password - sets a VPL access password that the course participant must provide to be able to use the activity.
- Standard module options - you determine the availability (whether the activity should be visible to students), optionally adding an id number and a group mode in the case of many groups.
- Access limitation - you specify the activity availability only for individual users; you can choose from the following options:
 - Cohort - limited to a specific student cohort only.
 - Complete an Activity - requires another activity to be completed before access.
 - Date - you define access only at a specific time.
 - Assessment - the requirement to obtain an appropriate grade (as a percentage) for another activity.
 - Password - requires a password to access the resource.
 - Roles - you define access based on the user's role in the course.
 - Restriction set - you specify a set of restrictions that must be met before being granted access.

3.4.4.1 Compiler Settings

Another important element is setting up the compiler and making it possible to compile, debug and run the programme. To do this, after creating a VPL activity, follow these steps:

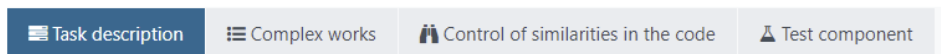
1. On the course page, in the selected topic, click on the name of the added VPL.
2. On the right side, select the option to edit the activity (gear).
3. Choose "Execution options."

Within the execution option, you can set the following option:


- Run script - you specify the compiler of the selected programming language; if you choose the automatic detection option, the compiler compatible with the extension of the transferred file will be chosen.
- Debug script - you specify the debugging language; if you select the automatic detection option, the compiler compatible with the extension of the transferred file will be chosen.
- Run - you define whether the course participant should be able to run his or her programme inside the VPL.
- Debug - you specify if the participant should be able to debug his or her programme inside the VPL.
- Automatic evaluation - specify whether the programme should be automatically checked based on test data.

3.4.4.2 Basic Information About a VPL Activity Created

After clicking on the name of the created activity on the course page, you will see a page with four tabs: Task description, Submitted papers, Code similarity check, and Test component.



Preparation for the colloquium

 **End date:** Wednesday, March 3, 2021,
01:00

Maximum number of

files: 5 **Type of work:** Individual work **Rating settings:** Maximum rating: 100

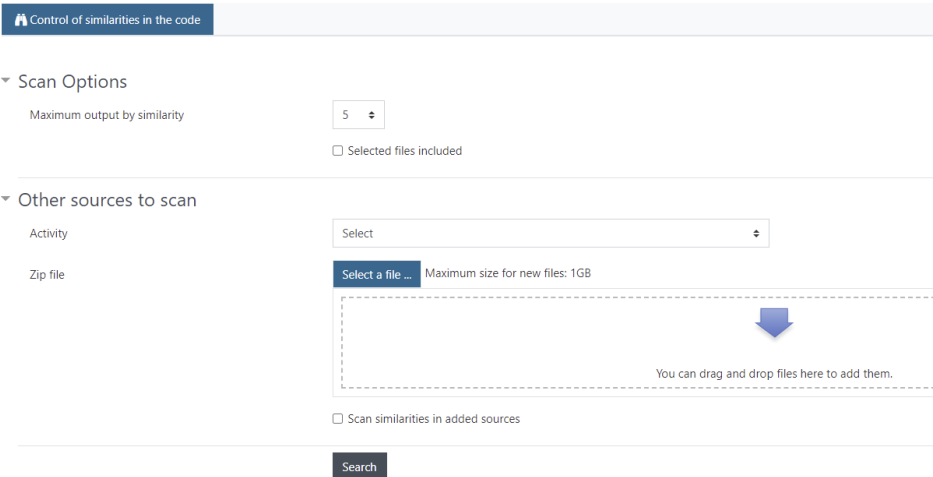
Run: Yes. **Debug:** Yes. **Ratings:** No    

Task description - this is the first tab devoted to the description of the task; in it, you can find a detailed description of the activity, the date of the end of the activity, the maximum number of files to be sent set by the teacher, information about whether the work is performed individually or in groups, the issue of setting grades.

In addition, information is included on whether the submitted code is subject to evaluation by the lecturer and whether the code written by the student can be debugged and run in VPL by the student.

Submitted works - under the 'Composed Works' tab, the teacher has access to all submitted works sent by course participants. The student's name and surname, information about the date of sending the document, the last version of the programme, the number of saved programmes (earlier copies of the code), and a gear wheel are displayed. After clicking on the gear wheel icon, you gain access to additional options, such as a preview of the submitted work, a list of submitted components, options, and the possibility of making a copy.

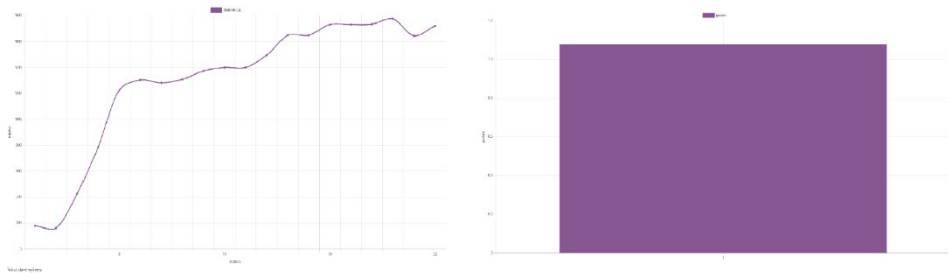
Checking the similarities in the code allows for analysing the similarities between the programmes sent by the course participants. It allows you to check the similarity to other submitted programmes, as well as to the solution sent by the teacher.



Test components - allows you to manage test components

3.4.4.3 Preview of the Submitted Work

As part of the submitted works, you can see a list of submitted components , an incremental graph of the size of the submitted files, and a graph of working time and activity within the task.



#	Date added	Task description	Action
17	tuesday, february 23, 2021, 5:03 pm	Test.cpp 5280b 1891	⚙️ ▾
16	tuesday, february 23, 2021, 5:02 pm	Test.cpp 5286b 1891	⚙️ ▾
15	tuesday, february 23, 2021, 5:01 pm	Test.cpp 5275b 1891	⚙️ ▾
14	tuesday, february 23, 2021, 5:00 pm	Test.cpp 5258b 1891	⚙️ ▾
13	tuesday, february 23, 2021, 4:12 pm	Test.cpp 5251b 1891	⚙️ ▾

After selecting any programme instance, the entire submitted programme is visible.

cos.cpp

```
1 #include <iostream>
2 #include <cstdlib>
3
4 using namespace std;
5
6 int main(){
7     int a;
8     int b;
9     cin >> a;
10    cin >> b;
11    int c = a+b;
12    cout << c << endl;
13 }
```

Additionally, an edit option can be chosen that makes changes in the code, runs it, debugs it, and performs tests at the evaluation level by the test examples created.



```
1  
2 #include <iostream>  
3 #include <cstdlib>  
4  
5 using namespace std;  
6  
7 int main(){  
8     int a;  
9     int b;  
10    cin >> a;  
11    cin >> b;  
12    int c = a+b;  
13    cout << c << endl;  
14 }
```

3.4.4.4 Preparation of Test Files and Check Programme

As part of the programme implementation, you can prepare test files to analyse the solution. You can create a test file by selecting the task settings (gear) and selecting test cases.

When creating a test case, its name should be given after the keyword "case", e.g., case = one

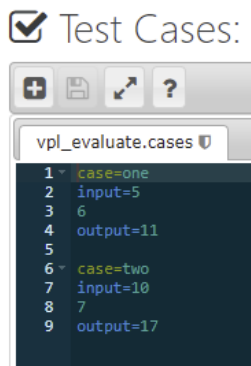
Then provide the input data that will be assigned to the values entered from the keyboard, e.g. (the two numbers to be added are entered, separated by an "enter" key - number 5 and number 6)

Input = 5

The next task is to pass the result of the operation after the keyword "output", e.g.

Output = 11

Sample test file (Test Cases):



3.4.5 Jupyter Notebook

Jupyter Notebook is an open-source web application. It allows the creation and sharing of documents with live code, various equations, visualisations, etc. Among the users of Jupyter Notebook, we can distinguish between numerical simulations, statistical modelling, machine learning, etc.

It is most often used as an application to create programmes in Python language and then analyze them. As part of Moodle, an instance of a virtual machine is created for each student, on which the student can create files. When creating a programme, the teacher does not have access to the created programme, so a good solution is to allow the student to upload the finished programme using a different activity.

After the end of the lesson, the programme is still available to the student for the time established by the administrators of the Moodle platform. The time of availability is defined as the time since the last launch of the programme by the student.

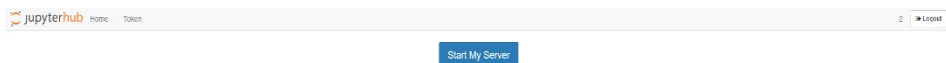
As part of the course, the teacher can add the Jupyter Notebook activity in the following way:

1. On the course website, you must enable access to the course editing mode ("notepad").
2. Under the topic in which the task is to be placed, click on "Add activity or resource."

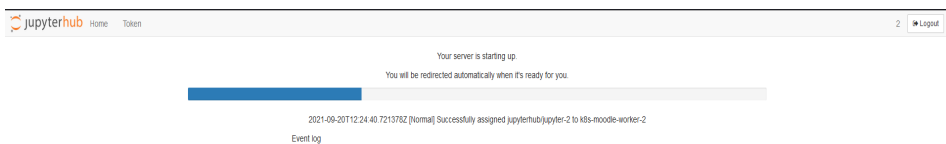
3. In the list of activities, find the Jupyter Notebook and then click on the resource icon.



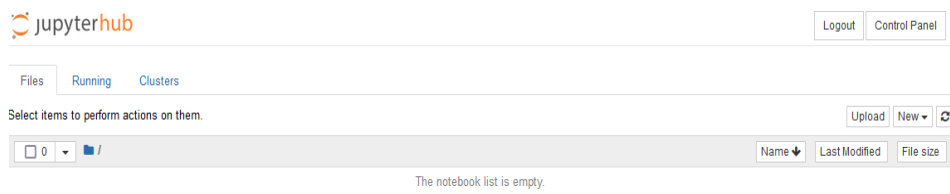
After clicking on the activity, the student can start his Notebook.



Then a virtual machine is created for the student to operate the Jupyter Notebook.



Once created, the student has the option to create their programme.



4 Assessing Students

This section describes the basic type of quiz designed for the examination and assessment of students.

4.1 Quiz

In this subsection, we present the basic test quiz.

4.1.1 Test Quiz

The Quiz test is an online real-time test in which the student has the opportunity to answer questions at the time specified by the teacher, which can then be checked automatically or manually by the teacher (depending on the type of questions described in the section questions types).

To create a Test Quiz activity, follow these steps:

1. Access to the course editing mode ("notepad") must be enabled on the course website.
2. As part of the topic in which the test quiz is to be placed, click on "Add activity or resource."
3. In the list of activities, find the test quiz and click on the activity icon.

Basic resource settings:

- Name - the name of the folder, visible to course participants.
- Description - description of the folder visible to course participants.
- Time - you define the date (day, hour) when the test will be available and its duration:
 - Open the test - the date on which the test becomes available to students (it is possible to start the test); if it is not enabled, the test is available continuously.
 - Close the test - you specify the date (day, time) on which the test is no longer available to students. They cannot start the test. If it is not enabled, the test is available continuously after opening.
 - Time limit - the time during which the student can write the test, starting from the moment the student starts the test.
 - After the time expires – it allows the supervisor to decide how the test should behave after the end of the test; you can choose one of three options:
 - Open approaches are saved automatically - after completing the test (timeout), the student's open approach

- is closed, and the answers given so far are saved and transferred for evaluation.
- Existing grace period - you specify the time that begins after exceeding the time limit and allows the student to review and approve their answers. Still, the student cannot answer new questions.
 - Attempts must be approved before the end of time - when selected, approaches that are not completed by the student and approved before the end of time are not validated.
 - Assessment - you define the method of assessment.
 - Assessment category - if you create a grade category, you can assign to which category the grade for the quiz should be assigned.
 - Passing threshold - you define the threshold at which the test is passed; it is used, among other functions, in the grading log, where quizzes taken are marked in green and failed quizzes in red.
 - Available approaches - you define how many times the student is allowed to take the quiz.
 - Assessment method - if you select that the student can take the quiz more than once, it allows you to specify how the quiz grade should be determined; there are several options to choose from:
 - Top grade.
 - Average grade.
 - The first attempt.
 - The last attempt.
 - Layout - you define basic information about the layout of the test view and how to view it:
 - Number of questions per page - divides the test into pages, and you determine how many questions should be visible on a single page; this is useful for long tests.
 - Navigation method - you define the way the student can view the quiz; there are two options to choose from:
 - Any - the student can freely navigate through the test, and move to the next and previous questions.

- Sequential - after answering the question, the student cannot return to it to change the answer.
- Questions Behavior - you specify how questions should be displayed and how questions should behave after answering:
 - Change the order inside the question - in the case of multiple-choice questions, it allows you to change the order of answers for each student taking the quiz.
 - How the questions behave - you define the behaviour of questions after the student answers or during the answer; there are several options to choose from:
 - Feedback after completion of the CBM approach.
 - Interactive with repetitions - if this option is selected, student see that they made a mistake immediately after answering and then has the option of correcting it, which, however, results in receiving a smaller number of points for the answer.
 - Immediate feedback - the student immediately after answering can see if the answer was correct.
 - Instant feedback from CBM.
 - Manual grading.
 - Delayed feedback - students answer questions, and only after all answers have been approved, they receive a grade and comment.
 - Adaptive mode.
 - Adaptive mode (no penalty).
- Review options - change the view for the student during and after the quiz, depending largely on the chosen behaviour of the questions and the inclusion of the duration.
 - You can specify the following options:
 - While testing (only available for interactive and immediate feedback modes) – it can be viewed while writing the test.
 - Immediately after the test - it can be viewed immediately after the end of the test (approx. 2 minutes).

- Later, while the test is still open - it can be viewed as long as the test is open.
- After closing the test - when the time has elapsed during which the test is available for all students to solve.
- The following items can be specified for each option:
 - Rehearsal - you specify whether the student can see his or her approach to the quiz.
 - Is correct – you display information to the student about the answer given by him or her as 'Correct', 'Partially correct' or 'Incorrect'.
 - Points - information about the number of points obtained for a specific task and the total number of points obtained for the entire quiz.
 - Detailed feedback - information prepared by the lecturer, which is displayed after the student has answered.
- Standard module options - you determine the availability (whether the activity should be visible to students), optionally adding an id number and a group mode in the case of many groups.
- Access limitation - you specify the activity availability only for individual users; you can choose from the following options:
 - Cohort - limited to a specific student cohort only.
 - Complete an Activity - requires another activity to be completed before access.
 - Date - you define access only at a specific time.
 - Assessment - the requirement to obtain an appropriate grade (as a percentage) for another activity.
 - Password - requires a password to access the resource.
 - Roles - you define access based on the user's role in the course.
 - Restriction set - you specify a set of restrictions that must be met before being granted access.

After creating a quiz, it is possible to fill it in with previously prepared questions or to create new questions.

To add questions to the quiz, follow these steps:

1. On the course page, find the quiz activity you added.
2. Enter the chosen quiz by clicking on its name.
3. On the right side of the quiz window, find a gear icon and click on it (it is not the same gear as for the course management).
4. Select the option "Edit test content" from the drop-down list.

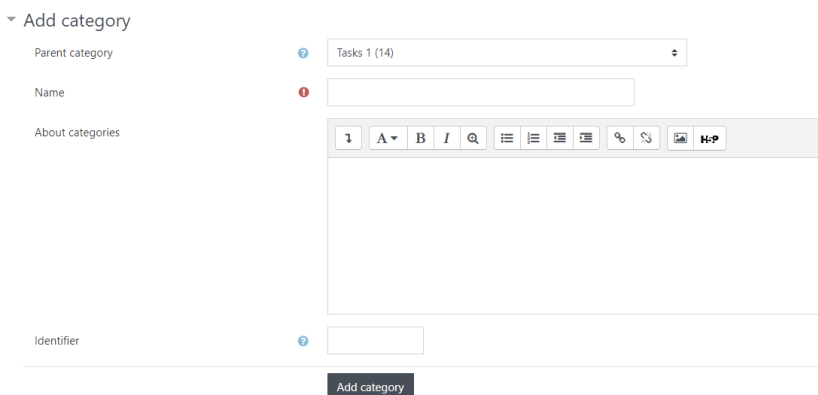
4.2 Question Database

4.2.1 Categories

This section describes the basics of creating categories and adding questions to categories. Categories are treated as directories into which questions can then be placed. They also allow you to create a hierarchical structure. The use of categories is considered good practice and allows you to break down the questions you create into some linked structures of a similar nature, which is great for creating random question quizzes.

To create a category, follow these steps:

1. Enable access to course management ("gears").
2. On the Question Bank page, select the Question Category.
3. At the bottom of the page, there is a button for adding a new category.



The screenshot shows the 'Add category' form in Moodle. It includes a dropdown menu for 'Parent category' (set to 'Tasks 1 (14)'), a text input field for 'Name', a rich text editor for 'About categories', and a text input field for 'Identifier'. A blue 'Add category' button is located at the bottom of the form.

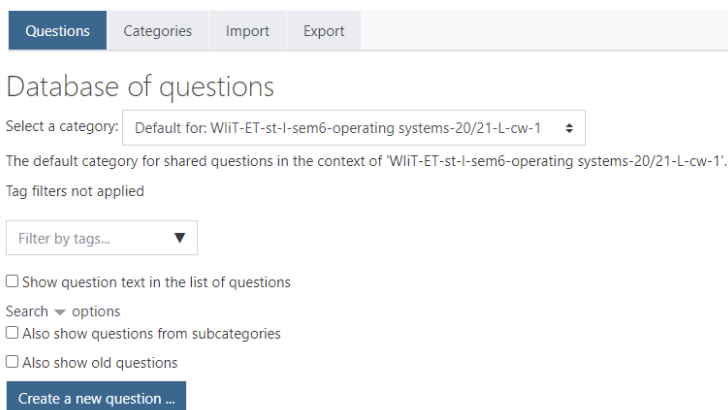
The most important element is to define the parent category in which the new category will be placed, then the name of the category and optional information about the category should be provided. Once created, it can also be moved elsewhere, modified, or deleted.



4.3 Question Types

This section describes the basic question types that can be created within the course and the general way to add questions. To add a new question, follow these steps:

1. Enable access to course management ("gears")
2. In the Question bank panel, select Question database
3. Specify the category to which the question should be added



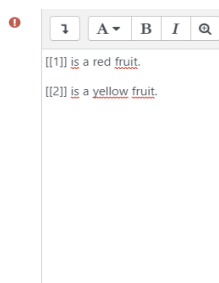
4.3.1 Drag and Drop

Question type where missing words in the text are filled with labels by drag and drop. When creating a question, the number of the label you want to place in the right place is specified in double square brackets.

Basic question settings:

- Current category - the current category in which the option to add a question has been selected, the question will be added to it.
- Save in category - in case of resignation from the current category, you can select the category in which the question should be located from the drop-down menu.
- Question name - the name displayed on the list of questions, helping to identify the question (but it is not visible to students).
- Content of the question - the content of the question intended for students:

Content of the question



- Default score - the default number of points to be obtained for the question (may be scaled when creating a test for students).
- General feedback - information is displayed to students after answering a question.
- ID - optional ID of the question must be unique.
- Choices - define the labels that can be added:
 - Random - selecting this option changes the order in which the labels are displayed randomly.
 - Choice [[n]] - where "n" is a number, which is the identifier to be entered in the text of the question as to the correct answer (to increase the pedagogic level of difficulty for students, you can add more labels than there are correct answers).
 - Answer - the content of the label.
 - Group - you define the label group (they differ in colours when displaying the question), e.g.

▼ Election

Randomly

Selection [[1]] Answer Group Infinity

Selection [[2]] Answer Group Infinity

Selection [[3]] Answer Group Infinity

Selection [[4]] Answer Group Infinity

- Complex feedback - you add additional information for the student to be displayed after answering:
 - For each correct answer - information is displayed if a correct answer is given.
 - For each partially correct answer – information is displayed when a partially correct answer is given.
- Multi-trial settings - necessary settings if the student is allowed to approach a question multiple times:
 - Penalty for each incorrect answer - reduction is expressed as a percentage of the possible points in the case of an incorrect answer.
 - Tip - advice aimed at helping the student.
 - Hint options - you clear only incorrect answers and display the number of correct answers to the student.
- Save changes - after pressing the save changes button, the question is added to the selected category.

View of an example question created based on the above description:

is a red fruit.

is a yellow fruit.

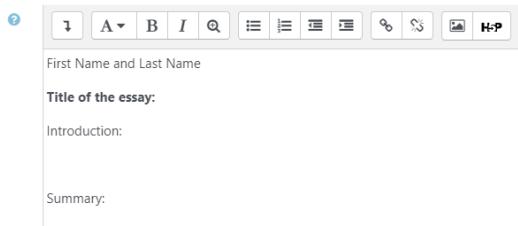
4.3.2 Essay

Question type that allows the student to answer by sending a file or filling in the editor field. Essay-type tasks must be manually graded by the tutor.

Basic question settings:

- Category - you select the category in which the question should be placed from the drop-down menu.
- Name of the question - the name is visible on the list of questions to help identify the question (but it is not visible to students).
- Content of the question - the content of the task is visible to students.
- Default score - the default number of points to be obtained for the question (it can be scaled when creating a test for students).
- General feedback - information is displayed to students after answering a question.
- ID - optional ID of the question must be unique.
- Response options - basic response options, we can distinguish:
 - Response format - you define the format of the response field for the student:
 - HTML editor - the editor field allows you to type using an HTML editor, insert links, images, equation editor, etc.
 - HTML editor with file selection - additionally allows you to insert audio/video recordings, word templates, etc.
 - Plain Text - Only keyboard text can be entered.
 - Required text - you specify whether the text field must contain content for the question to be sent.
 - Input field size - you define the number of lines of text visible to the student.
 - Allow attachments - allows students to upload files with solutions.
- Response template - you enter a template that is visible to the student and allows you to standardise the answers or indicate the form of the answer.

Response template



The screenshot shows the Moodle response template editor. At the top, there is a toolbar with various icons for text formatting (bold, italic, underline, link), list creation, and other editing tools. Below the toolbar, the text area contains the following content:

First Name and Last Name

Title of the essay:

Introduction:

Summary:

- Save changes - after pressing the save changes button, the question is added to the selected category.

The screenshot shows a question editor interface. On the left, a summary box displays: "Question 1", "No response", and "Points: 1,00". The main editor area is titled "Write an essay" and contains a rich text toolbar with icons for undo, font color, bold, italic, link, bulleted list, numbered list, table, link, unlink, redo, and image. Below the toolbar, the form includes a "First Name and Last Name" field, a "Title of the essay:" label, an "Introduction:" label, and a "Summary:" label.

4.3.3 Matching

Question type in which the content area and the list of names (possible to choose, displayed in the form of a drop-down menu) must be appropriately matched to the content.

Basic question settings:

- Category - you select the category in which the question should be placed from the drop-down menu.
- Name of the question - the name is visible on the list of questions, helping to identify the question (but it is not visible to students).
- Content of the question - the content of the task is visible to students.
- Default score - the default number of points to be obtained for the question (it can be scaled when creating a test for students).
- General feedback - information is displayed to students after answering a question.
- ID - optional ID of the question must be unique.
- Answers - you enter questions and answers. It is necessary to provide at least two questions (content area) and three answers (name list). To add additional incorrect answers, leave the question field blank.

▼ Response

Available options

You must provide at least two questions (left column) and three answers (right column). You can provide additional items where both question and answer are empty will be ignored.

Question 1	<p>England (England)</p>
Answer	<p>London</p>
Question 2	<p>Italy</p>
Answer	<p>Rome</p>
Question 3	
Answer	<p>Paris</p>

- Complex feedback - you add additional information for the student to be displayed after answering:
 - For each correct answer - information is displayed if a correct answer is given.
 - For each partially correct answer - information is displayed when a partially correct answer is given.
- Multi-trial settings - necessary settings to allow the student to approach a question repeatedly:
 - Penalty for each incorrect answer - reduction is expressed as a percentage of possible points in the case of an incorrect answer.
 - Tip - advice aimed at helping the student.
 - Hint options - you clear only incorrect answers and display the number of correct answers to the student.
- Save changes - after pressing the save changes button, the question is added to the selected category

Question 1
No response
Points: 1.00

Match the capital city to the country.

England (England)	Select...
Italy	Select...
	Select...
	Paris
	London
	Rome

Start again Save Fill in with correct answers Approve and finish Close preview

4.3.4 Matching by Drag and Drop

The question type in which the content area appears and the list of names (you can see them on the right side of the question) that must be appropriately matched to the content.

Basic question settings:

- Category - you select the category in which the question should be placed from the drop-down menu.
- Name of the question - the name is visible on the list of questions; it helps identify the question (but it is not visible to students).
- Content of the question - the content of the task is visible to students.
- Default score - the default number of points to be obtained for the question (it can be scaled when creating a test for students).
- General feedback - information is displayed to students after answering a question.
- ID - optional ID of the question must be unique.
- Answers - you enter questions and answers. It is necessary to provide at least two questions (content area) and three answers (name list). To add additional incorrect answers, leave the question field blank.
- Complex feedback - you add additional information for the student to be displayed after answering:
 - For each correct answer - information is displayed if a correct answer is given.
 - For each partially correct answer - information is displayed when a partially correct answer is given.
- Multi-trial settings - necessary settings to allow the student to approach a question repeatedly:
 - Penalty for each incorrect answer - reduction is expressed as a percentage of possible points in the case of an incorrect answer.
 - Tip - advice aimed at helping the student.
 - Hint options - you clear only incorrect answers and display the number of correct answers to the student.

- Save changes - after pressing the save changes button, the question is added to the selected category



The screenshot shows a Moodle question interface. On the left, a box contains the question details: "Question 1", "No response", and "Points: 1.00". The main content area displays the question text: "Match the capital city to the country." Below this, there are two categories listed: "Italy" and "England (England)". To the right of the categories, there are two empty input boxes, each with the placeholder text "Drag the answer here". On the far right, there is a list of possible answers: "Paris", "London", and "Rome", each in its own input box.

4.3.5 Multiple Choice

Question type that allows you to create a selection task with one or more correct answers.

Basic question settings:

- Category - you select the category in which the question should be placed from the drop-down menu.
- Name of the question - the name is visible on the list of questions, helping to identify the question (but it is not visible to students).
- Content of the question - the content of the task is visible to students.
- Default score - the default number of points to be obtained for the question (it can be scaled when creating a test for students)
- General feedback - information is displayed to students after answering a question.
- ID - optional ID of the question must be unique.
- Shuffle answers - selecting this option causes the random selection of answers on the list of answers.
- One or more answers? - select from the drop-down menu whether the question contains one correct answer or many correct answers.
- Numbering of responses - you choose the method of numbering the answers.
- Show standard instructions - you choose whether an instruction for answering should appear before the question, e.g., "select one answer", or "select all correct answers".

- Responses - you enter the answers and score them accordingly:
 - When selecting: Only one answer:
 - One of the answers should be given 100%.
 - If the other answers are chosen to mark none, 0 points are given for the incorrect answer.
 - If you choose negative values for the remaining answers if you choose a wrong answer, negative points are given by the percentage.
 - When selecting: More than one answer:
 - The sum of points for correct answers must be 100%.
 - If the remaining answers are chosen, no points are deducted, and no points are deducted for incorrect answers, so the student, by selecting all answers, gets 100% of the points.
 - If you choose negative points for the remaining answers, they are subtracted from the maximum number of points; choosing - 100% resets the result when selecting the correct and incorrect answer.
 - It is impossible to set receiving points only if you select all correct answers; for this, you can use the task: All or nothing.
- Complex feedback - you add additional information for the student to be displayed after answering:
 - For each correct answer - information is displayed if a correct answer is given.
 - For each partially correct answer - information is displayed when a partially correct answer is given.
- Multi-trial settings - necessary settings if the student is allowed to approach a question multiple times:
 - Penalty for each incorrect answer - reduction is expressed as a percentage of the possible points in the case of an incorrect answer.
 - Tip - advice aimed at helping the student.
 - Hint options - you clear only incorrect answers and display the number of correct answers from the students.

- Save changes - after pressing the save changes button, the question is added to the selected category.

Response

Choice 1	<input type="text"/> <input type="button" value="A"/> <input type="button" value="B"/> <input type="button" value="I"/> <input type="button" value="Q"/>
	4
Assessment	100% ▾
Feedback	<input type="text"/> <input type="button" value="A"/> <input type="button" value="B"/> <input type="button" value="I"/> <input type="button" value="Q"/>

Choice 2	<input type="text"/> <input type="button" value="A"/> <input type="button" value="B"/> <input type="button" value="I"/> <input type="button" value="Q"/>
	6
Assessment	No ▾
Feedback	<input type="text"/> <input type="button" value="A"/> <input type="button" value="B"/> <input type="button" value="I"/> <input type="button" value="Q"/>

Choice 3	<input type="text"/> <input type="button" value="A"/> <input type="button" value="B"/> <input type="button" value="I"/> <input type="button" value="Q"/>
	8
Assessment	-100% ▾
Feedback	<input type="text"/> <input type="button" value="A"/> <input type="button" value="B"/> <input type="button" value="I"/> <input type="button" value="Q"/>

4.3.6 All or Nothing Multiple Choice

A question type that creates a selection task with one or more correct answers, giving 100% if you selected all correct answers or 0% if you selected any incorrect answers or did not select all correct answers.

Basic question settings:

- Category - you select the category in which the question should be placed from the drop-down menu.
- Name of the question - the name is visible on the list of questions, helping to identify the question (but it is not visible to students).
- Content of the question - the content of the task is visible to students.
- Default score - the default number of points to be obtained for the question (it can be scaled when creating a test for students).

- General feedback - information is displayed to students after answering a question.
- ID - optional ID of the question; it must be unique.
- Shuffle answers - selecting this option causes the random selection of answers on the list of answers.
- One or more answers - you select from the drop-down menu whether the question contains one correct answer or many correct answers.
- Numbering of responses - you choose the method of numbering the answers, e.g. A, B, C or 1, 2, 3, etc.
- Responses – you enter answers and information on whether the answer is correct or not. To receive points, the student must select all answers marked as correct.
- Complex feedback - you add additional information for the student to be displayed after answering:
 - For each correct answer - information is displayed if a correct answer is given.
 - For each partially correct answer - information is displayed when a partially correct answer is given.
- Multi-trial settings - necessary settings if the student is allowed to approach a question multiple times
 - Penalty for each incorrect answer - reduction is expressed as a percentage of the possible points in the case of an incorrect answer.
 - Tip - advice aimed at helping the student.
 - Hint options - you clear only incorrect answers and display the number of correct answers from the students.
- Save changes - after pressing the save changes button, the question is added to the selected category.

4.3.7 Short answer

A question type that allows the student to enter a short answer of several words, which is then compared to the entered patterns.

Basic question settings:

- Category - you select the category in which the question should be placed from the drop-down menu.
- Name of the question - the name is visible on the list of questions, helping to identify the question (but it is not visible to students).
- Content of the question - the content of the task is visible to students.
- Default score - the default number of points to be obtained for the question (it can be scaled when creating a test for students).
- General feedback - information is displayed to students after answering a question.
- ID - optional ID of the question, must be unique.
- Case-sensitive – you define whether the student's entered letters are case sensitive.
- Answers - you enter the answers (answer patterns) and the appropriate number of points due to them. The symbol "*" stands for any character
- Complex feedback - you add additional information for the student to be displayed after answering
 - For each correct answer - information is displayed if a correct answer is given.
 - For each partially correct answer - information is displayed when a partially correct answer is given.
- Multi-trial settings - necessary settings if the student is allowed to approach a question multiple times:
 - Penalty for each incorrect answer - reduction is expressed as a percentage of the possible points in the case of an incorrect answer.
 - Tip - advice aimed at helping the student.
 - Hint options - you clear only incorrect answers and display the number of correct answers from the students.
- Save changes - after pressing the save changes button, the question is added to the selected category.

4.3.8 Numerical

Question type that allows you to enter a numerical answer that is checked by comparing it with the pattern introduced by the teacher, taking into account the tolerance (e.g. rounding off).

Basic question settings:

- Category - you select the category in which the question should be placed from the drop-down menu.
- Name of the question - the name is visible on the list of questions, helping to identify the question (but it is not visible to students).
- Content of the question - the content of the task is visible to students.
- Default score - the default number of points to be obtained for the question (it can be scaled when creating a test for students).
- General feedback - information is displayed to students after answering a question.
- ID - optional ID of the question, must be unique.
- Case-sensitive - you define whether the student's entered letters are case sensitive.
- Responses - you enter answers in numerical form, including an acceptable error and a grade for a given answer.
- Unit related settings - you enter units as an element of evaluation:
 - Unit related settings - three options can be selected, units are not used, the unit is optional or necessary.
 - Decreasing the grade for error in the unit - in the case of selecting the option that the unit is necessary, it is possible to designate in the range (0-1) for how many percent of points are subtracted for the wrong unit.
 - Unit entered via - you define how the unit should be entered. There are three options to choose from, a text box, a button, and a drop-down list.
 - The unit stands up - you specify whether a unit should appear before or after a numerical value.

- Units - you enter the correct unit.
- Multi-trial settings - necessary settings if the student is can answer a question multiple times.
 - Penalty for each incorrect answer - reduction is expressed as a percentage of the possible points in the case of an incorrect answer.
 - Tip - advice aimed at helping the student.
 - Hint options - you clear only incorrect answers and display the number of correct answers from the students.
- Save changes - after pressing the save changes button, the question is added to the selected category.

4.3.9 True/False

True / False question type.

Basic question settings:

- Category - you select the category in which the question should be placed from the drop-down menu.
- Name of the question - the name is visible on the list of questions, helping to identify the question (but it is not visible to students).
- Content of the question - the content of the task is visible to students.
- Default score - the default number of points to be obtained for the question (it can be scaled when creating a test for students).
- General feedback - information is displayed to students after answering a question.
- ID - optional ID of the question, must be unique.
- Correct answer – you determine whether the correct answer is marked true or false by the student.
- Multi-trial settings - necessary settings if the student is allowed to approach a question multiple times:
 - Penalty for each incorrect answer - reduction is expressed as a percentage of the possible points in the case of an incorrect answer.
 - Tip - advice aimed at helping the student.

- Hint options - you clear only incorrect answers and display the number of correct answers from the students.
- Save changes - after pressing the save changes button, the question is added to the selected category.

4.4 Import Questions

This section describes how to import course questions from a previously created file.

To import questions to the course, follow these steps:

1. Enable access to course management ("gears")
2. In the Question bank pane, select Import
3. Select the format of the question file you want to import
4. Select the main category to which the questions should be imported
5. Determine what the system should do when an error occurs
6. Placing the question file via the activity window or drag and drop the file
7. Click on the import button

4.5 Export Questions

This section describes how to export questions from a course to a file that you can use to import in another course in the future. In Moodle, you can export questions to several basic formats, detailed in Formats and Examples of files with questions. In the case of questions with an attached multimedia file, it is recommended to use the Moodle XML file.

To export course questions to a file, follow these steps:

1. Enable access to course management ("gears")
2. In the Question bank panel, select Export
3. Select the format of the question file to which you want to export
4. Select the main category from which the export is to be performed (subcategories of the selected category are automatically included)
5. Click on the Export questions to file button

5 Backup and Restore

This chapter describes how to backup a created course and how to restore a course from a created template with data.

5.1 Backup

This section describes how to back up your course. The teacher within his or her course has the option to back up selected parts of the course, which can be used to maintain the history of the course being conducted or to create a new course using the topics and data included in the current course. This copy can be generated and saved to disk in an offline form.

To create a backup file of your course, follow these steps:

1. Enable access to course management ("gears")
2. In the Course Settings pane, select Backup
3. Select Backup settings, which allow you to define what the backup should contain. The most important elements include: including course users, activities, resources, blocks, files, question bank, and groups
4. Select the scheme settings and include the individual activities within the copy
5. At the bottom of the page, click on the backup button

5.2 Course Restoring

This section describes how to restore your course from a backup. The previously created backup file in the .mbz format allows you to restore the course together with the data contained in the backup.

To restore a course from a backup, follow these steps:

1. Enable access to course management ("gears")
2. In the Course Settings pane, select Restore
3. Select the file to import through the activity field or by drag and drop
4. At the bottom of the page, click on Restore

Conclusions

The developed document is based on an analysis of websites and the authors' own experience. The main document that contributed to the development of the handbook was the Moodle documentation available at www:https://docs.moodle.org. The Moodle documentation provides fully detailed descriptions of all components, but due to its universal nature does not correspond 100% to the template used in the project.

In the future, the authors of the user guide will introduce additional information on the new features implemented in Moodle and added to the platform used and, in the event of receiving feedback from users, will supplement the existing version with elements that may help to better understand and use the platform. The authors also plan to develop short instructional videos to further facilitate the management of the platform for both the administrator and the teachers.

References

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