



NETLAB+[®]

LMS LTI Integration Guide

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This guide documents features available in **NETLAB+ VE version 21.3.1** and later.



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Introduction

This is the *NETLAB+ LMS LTI Integration Guide* for the virtual edition of NETLAB+. The material in this guide includes instructions on configuring NETLAB+ to integrate with your school's Learning Management System (LMS).

It has become increasingly popular in institutes of higher education to use a Learning Management System (LMS), education technology that provides a cohesive online environment and facilitates the sharing of resources such as syllabus information and other course-related content. The LMS environment can also be beneficial as a means of communication between instructor/student and for facilitating grading and assessment of assignments. An LMS may also function as a communications hub to support student collaboration.

Some of the most widely used LMS applications include Blackboard, Moodle, and Canvas; these applications are often branded and customized to reflect the school's unique identity and contribute to fostering a sense of community, recognizing that the online environment beyond the classroom is vitally important in meeting the needs of today's students.

Another compelling reason for a school to use an LMS is that it can act as a one-stop destination for students and instructors to access externally-hosted learning tools used to enhance the educational experience. Students will have the advantage and convenience of access to labs, along with other class materials, through a single sign-on.

NETLAB+ supports LMS-LTI integration using Learning Tools Interoperability (LTI), a standard protocol developed by the IMS Global Learning Consortium for integrating any Learning Management System (LMS) with any learning application. LTI is essentially plug-and-play; the NETLAB+ administrator or instructor integrates access to NETLAB+ from their LMS using the LMS access key and common cartridge.

1 Understanding LTI Integration with NETLAB+

There are several considerations to be aware of regarding the implementation of LTI Integration. If you choose to use LTI Integration, students will perform all lab activities (scheduling and attending lab reservations) through the LMS. Students will not have the ability to log in to your NETLAB+ system directly.



Accounts created automatically by NETLAB+ to support LTI Integration function differently from accounts created by NETLAB+ administrators and instructors to use NETLAB+ directly. Accounts created through LTI Integration can be accessed only through the LMS.

A summary of the notable differences between using LTI Integration and using your NETLAB+ system directly is shown in the table below.

	LTI Integration	NETLAB+ Direct
Student Account Creation	Student accounts are created automatically by NETLAB+. A student's account is created during the student's first-time access to the labs, through the LMS.	Student accounts must be created by the instructor or NETLAB+ administrator (via the accounts management form or by importing a list).
Student Access to Schedule and Attend Lab Reservations	Students perform all activities through the LMS.	Students sign in to their NETLAB+ account to perform all activities.
Instructor Access to Schedule and Attend Lab Reservations, and Management Tools	Instructors may access through the LMS or log in directly to NETLAB+ using their instructor account.	Instructors log in to their NETLAB+ instructor account.
Student Team Assignments (optional)	Team assignments are made by the instructor or NETLAB+ administrator. Because student accounts are created at the time of their initial access, a team assignment may only be made after the student has completed their first-time access to the lab material.	Team assignments are made by the instructor or NETLAB+ administrator at any time after account creation.

2 Enabling LTI Integration in NETLAB+

LMS-LTI integration is configured at the community level. A NETLAB+ system includes one or more communities. A *community* is a distinct group of instructors, students, and classes. An Instructor may only manage students and classes within their own community. The ability to support multiple communities on NETLAB+ is designed to facilitate the sharing of a NETLAB+ system among several different groups (schools, institutions, academies, etc.).



Multiple communities are optional. Keep in mind that each instructor, student, and class can belong to only one community. If you do not wish to use communities, all of your accounts and classes must reside in the default community.

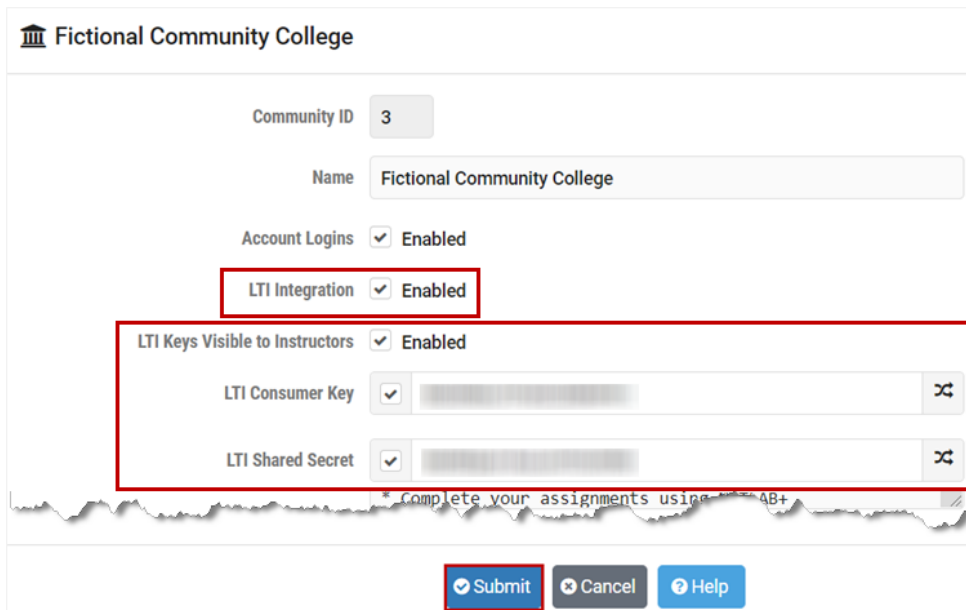
2.1 Community Settings for LTI Integration

1. From the Communities option on the Administrator home page, select a community record to edit. If your NETLAB+ system has not been configured to have multiple communities, it will contain only one community, the default.



For details on selecting and editing a communities, please see the [Manage Communities section of the NETLAB+ VE Administrator Guide](#).

2. The community record includes several settings used to configure LMS-LTI integration with NETLAB+. To display these settings, select the checkbox to **Enable LTI Integration**.



Fictional Community College

Community ID: 3

Name: Fictional Community College

Account Logins: Enabled

LTI Integration: Enabled

LTI Keys Visible to Instructors: Enabled

LTI Consumer Key: [Redacted] [X]

LTI Shared Secret: [Redacted] [X]

* Complete your assignments using NETLAB+

3. The additional settings for LTI integration will be displayed (see above). The fields are described in detail below.


Field Descriptions - Community Edit Record – LMS LTI Settings

- **LTI Integration:** Enable and disable NETLAB+ LTI integration features for an LMS. Learning Tools Interoperability (LTI) is a standard protocol developed by the IMS Global Learning Consortium for integrating any Learning Management System (LMS) with any learning application.
- **LTI Keys Visible to Instructors:** If enabled, instructors will be provided with this community's Consumer Key and Shared Secret when exporting an LMS Common Cartridge for their class. These keys will be required to use NETLAB+ as an external tool within an LMS. If disabled, instructors will be referred to the NETLAB+ administrator to provide the keys or enable the NETLAB+ external tool for the LMS.
- **LTI Consumer Key:** A key that is used to identify this community as a consumer to an LMS. This will be required to configure NETLAB+ as an external tool. Changing this value will invalidate any existing NETLAB+ external tools for this community on the LMS. The button on the right of the field can be used to generate a random value, but custom values may be used. If this value is changed unintentionally, its submission can be prevented by unchecking the checkbox on the left.
- **LTI Shared Secret:** A secret used by this community to establish ownership of the Consumer Key. This will be required to configure NETLAB+ as an external tool. Changing this value will invalidate any existing NETLAB+ external tools for this community on the LMS. The button on the right of the field can be used to generate a random value, but custom values may be used. If this value is changed unintentionally, its submission can be prevented by unchecking the checkbox on the left.

2.2 Export the LTI Cartridge for a Class







Follow the steps below to obtain the common cartridge needed for LTI integration for a class. An LTI cartridge may be exported by the NETLAB+ administrator or by an instructor if the option to make LTI Keys Visible to instructors has been enabled by the NETLAB+ administrator.

1. Select the class record in NETLAB+. If the option to enable LTI Integration has been enabled at the community level, you may select the option to **Export an LTI Cartridge** that you can import into your school's LMS in order to configure access to the class.


 Ethical Hacking Fall 2020

Settings Leads **1** Roster **1** Content

ID	35
Name	Ethical Hacking Fall 2020
Start Date	None
End Date	None
Self Study Access	Students Teams
Lab Time Limits	Enforce lab author's time limits
Maximum Length of Reservation	1.0 hours
Reservation Extensions Allowed	This Class: up to 2 extensions Community: up to 3 extensions (current settings will allow up to 2 extensions)
Minimum Time Between Reservations	unrestricted
Maximum Screenshots Per Lab	20
Multiple Labs in Same Reservation	Enabled

 Dismiss
 Edit
 View Reservations
 View Class Lab Usage
 Export LTI Cartridge
 Delete Class



- The **Export Class Common Cartridge** page will be displayed. Clicking the **Export** button will prompt you to download an `.imsc` file that is conformant with the IMS Common Cartridge v1.0 standard. If you have the necessary permissions, you may import the cartridge into your LMS class to add the associated content.

 Export Class Common Cartridge

Clicking the export button below will prompt you to download an `.imsc` file that is conformant with the IMS Common Cartridge v1.0 standard. If you have the necessary permissions, you may import the cartridge into your LMS class to add the associated content. Please refer to your LMS's documentation regarding the importation of Common Cartridge files as well as the configuration and use of LTI external tools. After the file is uploaded to the LMS, you will need the **Consumer Key** and the **Shared Secret** to configure the NETLAB+ VE external tool for your class.

Consumer Key:

Shared Secret:

 Export
 Cancel



Please refer to your LMS's documentation regarding the importation of Common Cartridge files as well as the configuration and use of LTI external tools. After the file is uploaded to the LMS, you will need the **Consumer Key** and the **Shared Secret** to configure the NETLAB+ VE external tool for your class.

3 Enabling Access to NETLAB+ Within Your LMS



LMS systems are often branded and customized specifically for an organization. The appearance of your LMS and the functionality of the user interface may vary from others due to a variety of variables, including LMS version, software updates, customization, branding, and instructor permission levels.

We recommend that you contact the administrator of your school's LMS for guidance on enabling access to NETLAB+ within your LMS. You will need the Consumer Key and Shared Secret for your class (available through NETLAB+ as part of class settings; see the previous section, [Export the LTI Cartridge for a Class](#)).

When configuring an LTI 1.1 external tool for use with NETLAB+, there are a few common settings that must be made in order for the tool to work correctly. Each LMS presents these common settings somewhat differently, but they can usually be found by referencing the LMS documentation regarding *External Tools*.

- **Consumer Key:** This key is unique to your NETLAB+ community and is assigned by the administrator. This value may be visible when exporting a class Common Cartridge, depending on administrative settings. If it is not, you may need to contact the NETLAB+ administrator for it.
- **Shared Secret:** This secret is unique to your NETLAB+ community and is assigned by the administrator. This value may be visible when exporting a class Common Cartridge, depending on administrative settings. If it is not, you may need to contact the NETLAB+ administrator for it.
- **Launch URL:** This URL instructs the tool on where to direct LTI Launch requests for NETLAB+. This URL will typically be structured as follows:
<https://<THE NETLAB+ FQDN>/lti-launch.cgi>
- **Privacy Settings:** The privacy settings for the external tool must allow users' names and email addresses to be made available to NETLAB+ for the purpose of automated account creation.