



Classync - Virtual Classroom Platform

Unit Testing Report

Group - 33

Course: Software Engineering

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1. Unit Testing Overview

1.1 Coverage Metrics

Code coverage metrics measure the extent to which source code is executed by tests:

- **Statements:** Percentage of executable statements executed by tests
- **Branches:** Percentage of conditional branches (if/else) executed
- **Functions:** Percentage of function definitions executed
- **Lines:** Percentage of source code lines executed

2. Overall Coverage Summary

2.1 Executive Summary

Table 2.1: Overall Unit Testing Coverage

Coverage Type	Statements	Branches	Functions	Lines
Overall Project	86.19%	73.51%	86.06%	87.61%

The project achieves strong overall unit test coverage with statements (86.19%), functions (86.06%), and lines (87.61%) all exceeding 85%. Branch coverage (73.51%) indicates room for improvement in testing conditional logic.

3. Detailed File-Level Coverage

3.1 File Coverage Results

Table 3.1: Complete Unit Test Coverage (Sorted by Statement Coverage)

File/Directory	Statements	Branches	Functions	Lines
app/admin	100%	100%	100%	100%
app/ai-tools	100%	100%	100%	100%
app/ai-tools/chatbot	100%	100%	100%	100%
app/ai-tools/summary	100%	78.57%	100%	100%
app/api/ai-bubble	100%	78.57%	100%	100%
app/api/ai-chat	100%	78.57%	100%	100%
app/api/assignments/[id]	100%	91.17%	100%	100%
app/api/auth/check-email-verified	100%	100%	100%	100%
app/api/classroom	100%	100%	100%	100%
app/api/classroom/[id]	100%	100%	100%	100%
app/api/comments	100%	84%	100%	100%
app/api/courses	100%	96.66%	100%	100%
app/api/courses/[id]	100%	100%	100%	100%
app/api/courses/enroll	100%	100%	100%	100%
app/api/courses/unenroll	100%	100%	100%	100%
app/api/download/[type]/[id]	100%	100%	100%	100%
app/api/groups	100%	100%	100%	100%
app/api/initdb	100%	100%	100%	100%
app/api/notifications	100%	95%	100%	100%
app/api/seed	100%	100%	100%	100%
app/api/stream/vote	100%	86.66%	100%	100%
app/api/students	100%	100%	100%	100%
app/api/summarize	100%	100%	100%	100%
app/api/users	100%	93.75%	100%	100%
app/api/users/[uid]	100%	100%	100%	100%
app/api/users/remove-photo	100%	100%	100%	100%
app/api/users/update-photo	100%	87.5%	100%	100%

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Table 3.1 continued

File/Directory	Statements	Branches	Functions	Lines
app/api/users/update-username	100%	100%	100%	100%
app/api/users/upload-photo	100%	81.81%	100%	100%
app/assignments	100%	100%	100%	100%
components	100%	100%	100%	100%
components/ai-bubble	100%	100%	100%	100%
components/chat	100%	100%	100%	100%
components/groups	100%	100%	100%	100%
app/ai-tools/chatbot/components	99.37%	82.43%	100%	100%
app/api/groups/[groupId]	98.64%	90.9%	100%	100%
components/group-edit	98.3%	72.88%	93.75%	98.14%
app/api/announcements	98%	87.5%	100%	98%
app/api/student/progress	97.91%	100%	100%	100%
app/student/progress	97.75%	71.79%	100%	98.8%
lib/langchain	97.5%	100%	50%	97.5%
app/api/courses/progress	96.15%	100%	100%	100%
app/api/assignments	95.95%	82.69%	100%	95.83%
components/ui	94.52%	82.01%	95.83%	94.91%
app/api/auth/send-verification-email	94.23%	78.37%	100%	94.11%
app/api/chat	93.33%	95.65%	100%	96.49%
lib/utils	92%	80%	100%	92%
app/api/instructor/analytics	91.85%	83.14%	100%	94.53%
app/sidebar	90.9%	74.28%	91.66%	91.37%
app/api/stream	90.03%	77.73%	86.95%	90.83%
app	90%	50%	50%	89.47%
app/api/auth	88.88%	92.59%	75%	88.88%
app/instructor/analytics	88.63%	66.23%	86.95%	90.12%
app/api/auth/verify	87.87%	91.3%	100%	90.62%
app/assignments/[id]	87.87%	58.53%	70%	95%
app/api/notifications/stream	87.5%	60%	88.88%	96%
app/classroom/[id]/group/[groupId]	86.11%	62.96%	71.42%	86.11%
app/homepage	83.41%	78.21%	72.41%	84.18%
components/admin	82.51%	66.41%	88.09%	84.36%
app/student	81.16%	62.23%	91.07%	81.98%
app/verify-success	80%	50%	66.66%	84.61%
components/navigation	79.34%	69.02%	72.81%	80.84%
components/auth	77.66%	74.76%	76.78%	78.36%
components/whiteboard	77.1%	59.3%	76.47%	79.2%

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Table 3.1 continued

File/Directory	Statements	Branches	Functions	Lines
app/api/submissions	77.09%	59.14%	100%	78.89%
lib	75.19%	71.42%	68.42%	74.57%
components/classroom	74.76%	60.52%	73.47%	79.01%
app/classroom	67.21%	54.79%	86.95%	64.91%

All files

86.19% Statements 5864/6803

73.51% Branches 2931/3987

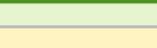
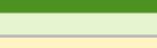
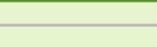
86.06% Functions 1136/1320

87.61% Lines 5623/6418

Press *n* or *j* to go to the next uncovered block, *b*, *p* or *k* for the previous block.

Filter:

File ▲	Statements	Branches	Functions	Lines
app	<div style="width: 90%;">███████████</div>	90%	18/20	50%
app/admin	<div style="width: 100%;">██████████</div>	100%	3/3	100%
app/ai-tools	<div style="width: 100%;">██████████</div>	100%	14/14	100%
app/ai-tools/chatbot	<div style="width: 100%;">██████████</div>	100%	3/3	100%
app/ai-tools/chatbot/components	<div style="width: 99.37%;">███████████</div>	99.37%	158/159	82.43%
app/ai-tools/summary	<div style="width: 100%;">██████████</div>	100%	33/33	78.57%
app/api/ai-bubble	<div style="width: 100%;">██████████</div>	100%	15/15	78.57%
app/api/ai-chat	<div style="width: 100%;">██████████</div>	100%	15/15	78.57%
app/api/announcements	<div style="width: 98%;">██████████</div>	98%	49/50	87.5%
app/api/assignments	<div style="width: 95.95%;">██████████</div>	95.95%	95/99	82.69%
app/api/assignments/[id]	<div style="width: 100%;">██████████</div>	100%	119/119	91.17%
app/api/auth	<div style="width: 88.88%;">██████████</div>	88.88%	40/45	92.59%
app/api/auth/check-email-verified	<div style="width: 100%;">██████████</div>	100%	14/14	100%
app/api/auth/send-verification-email	<div style="width: 94.23%;">██████████</div>	94.23%	49/52	78.37%
app/api/auth/verify	<div style="width: 87.87%;">██████████</div>	87.87%	29/33	91.3%
app/api/chat	<div style="width: 93.33%;">██████████</div>	93.33%	56/60	95.65%
app/api/classroom	<div style="width: 100%;">██████████</div>	100%	23/23	100%
app/api/classroom/[id]	<div style="width: 100%;">██████████</div>	100%	22/22	100%
app/api/comments	<div style="width: 100%;">██████████</div>	100%	36/36	84%
app/api/courses	<div style="width: 100%;">██████████</div>	100%	61/61	96.66%
app/api/courses/[id]	<div style="width: 100%;">██████████</div>	100%	22/22	100%
app/api/courses/enroll	<div style="width: 100%;">██████████</div>	100%	27/27	100%
app/api/courses/progress	<div style="width: 96.15%;">██████████</div>	96.15%	25/26	100%
app/api/courses/unenroll	<div style="width: 100%;">██████████</div>	100%	25/25	100%
app/api/download/[type]/[id]	<div style="width: 100%;">██████████</div>	100%	25/25	100%
app/api/groups	<div style="width: 100%;">██████████</div>	100%	40/40	100%
app/api/groups/[groupId]	<div style="width: 98.64%;">██████████</div>	98.64%	73/74	90.9%
app/api/initdb	<div style="width: 100%;">██████████</div>	100%	13/13	100%
app/api/instructor/analytics	<div style="width: 91.85%;">██████████</div>	91.85%	124/135	83.14%
app/api/notifications	<div style="width: 100%;">██████████</div>	100%	45/45	95%
app/api/notifications/stream	<div style="width: 87.5%;">██████████</div>	87.5%	49/56	60%
app/api/seed	<div style="width: 100%;">██████████</div>	100%	33/33	100%
app/api/stream	<div style="width: 90.03%;">██████████</div>	90.03%	235/261	77.73%
app/api/stream/vote	<div style="width: 100%;">██████████</div>	100%	48/48	86.66%
app/api/student/progress	<div style="width: 97.91%;">██████████</div>	97.91%	47/48	100%

File ▾		Statements	Branches	Functions	Lines
app/api/students		100%	22/22	100%	2/2
app/api/submissions		77.09%	175/227	59.14%	9/9
app/api/summarize		100%	17/17	100%	1/1
app/api/users		100%	35/35	93.75%	2/2
app/api/users/[uid]		100%	16/16	100%	1/1
app/api/users/remove-photo		100%	16/16	100%	2/2
app/api/users/update-photo		100%	18/18	87.5%	2/2
app/api/users/update-username		100%	37/37	100%	3/3
app/api/users/upload-photo		100%	18/18	81.81%	2/2
app/assignments		100%	6/6	100%	100%
app/assignments/[id]		87.87%	58/66	58.53%	70%
app/classroom		67.21%	123/183	54.79%	40/46
app/classroom/[id]/group/[groupId]		86.11%	31/36	62.96%	71.42%
app/homepage		83.41%	166/199	78.21%	21/29
app/instructor/analytics		88.63%	78/88	66.23%	90.12%
app/sidebar		90.9%	110/121	74.28%	91.37%
app/student		81.16%	237/292	62.23%	22/24
app/student/progress		97.75%	87/89	71.79%	100%
app/verify-success		80%	12/15	50%	4/6
components		100%	34/34	100%	100%
components/admin		82.51%	368/446	66.41%	74/84
components/ai-bubble		100%	39/39	100%	36/36
components/auth		77.66%	299/385	74.76%	43/56
components/chat		100%	22/22	100%	22/22
components/classroom		74.76%	634/848	60.52%	169/230
components/group-edit		98.3%	58/59	72.88%	98.14%
components/groups		100%	6/6	100%	4/4
components/navigation		79.34%	365/460	69.02%	75/103
components/ui		94.52%	673/712	82.01%	95.83%
components/whiteboard		77.1%	165/214	59.3%	26/34
lib		75.19%	194/258	71.42%	74.57%
lib/langchain		97.5%	39/40	100%	1/2
lib/utils		92%	23/25	80%	2/2

Code coverage generated by [istanbul](#) at 2025-11-28T01:35:58.734Z