

Unit Testing Report

1. Auth.js

File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	98.81	96.72	100	98.8	
Auth.js	98.81	96.72	100	98.8	210,242

Test Suites: 9 passed, 9 total
Tests: 69 passed, 69 total
Snapshots: 0 total
Time: 4.013 s, estimated 5 s
Ran all test suites matching controllers/Auth.test.

2. ChatController.js

PASS	controllers/ChatController.test/getChat.test.js				
File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	100	100	100	100	
...roller.js	100	100	100	100	

Test Suites: 6 passed, 6 total
Tests: 27 passed, 27 total
Snapshots: 0 total
Time: 3.382 s
Ran all test suites matching controllers/ChatController.test.

3. CodeController.js

```
PASS controllers/CodeController.test/analyse.test.js
-----|-----|-----|-----|-----|-----
File      | % Stmts | % Branch | % Funcs | % Lines | Uncovered Line #s
-----|-----|-----|-----|-----|-----
All files |    100   |     90   |    100   |    100   |
...roller.js |    100   |     90   |    100   |    100   |    34
-----|-----|-----|-----|-----|-----

Test Suites: 2 passed, 2 total
Tests:       18 passed, 18 total
Snapshots:   0 total
Time:        1.383 s
Ran all test suites matching controllers/CodeController.test.
```

4. OAuthController.js

```
PASS controllers/OAuthController.test/login.test.js
PASS controllers/OAuthController.test/githubLogin.test.js
-----|-----|-----|-----|-----|-----
File      | % Stmts | % Branch | % Funcs | % Lines | Uncovered Line #s
-----|-----|-----|-----|-----|-----
All files |    100   |    100   |    100   |    100   |
...roller.js |    100   |    100   |    100   |    100   |
-----|-----|-----|-----|-----|-----

Test Suites: 4 passed, 4 total
Tests:       20 passed, 20 total
Snapshots:   0 total
Time:        4.456 s
Ran all test suites matching controllers/OAuthController.test.
PS C:\Users\AYUSH MITTAL\Downloads\IT314_Project-main_off1\IT314_Project-ma
```

5. Roadmap.js

```
PASS controllers/Roadmap.test/fetchSubtopicExplanation.test.js
PASS controllers/Roadmap.test/getNotesForRoadmap.test.js
```

File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	100	100	100	100	
Roadmap.js	100	100	100	100	

```
Test Suites: 14 passed, 14 total
Tests:       99 passed, 99 total
Snapshots:   0 total
Time:        10.847 s
Ran all test suites matching controllers/Roadmap.test.
```

6. S3Controller.js

File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	100	98.07	100	100	
...roller.js	100	98.07	100	100	221

```
Test Suites: 11 passed, 11 total
Tests:       51 passed, 51 total
Snapshots:   0 total
Time:        4.744 s
Ran all test suites matching controllers/S3Controller.test.
```

7. UserController.js

File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	100	98.38	100	100	
...roller.js	100	98.38	100	100	105

Test Suites: 8 passed, 8 total
Tests: 35 passed, 35 total
Snapshots: 0 total
Time: 8.031 s
Ran all test suites matching controllers/UserController.test.

8. Middleware(userAuth.js)

PASS middlewares/userAuth.test.js					
userAuth middleware					
✓ returns 401 if no token is provided (5 ms)					
✓ decodes token and calls next when valid (1 ms)					
✓ returns 401 if tokenDecode.id is missing (1 ms)					
✓ returns 401 when jwt.verify throws an error (26 ms)					
✓ returns 401 if token is empty string					
File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	100	100	100	100	
userAuth.js	100	100	100	100	

Test Suites: 1 passed, 1 total
Tests: 5 passed, 5 total
Snapshots: 0 total
Time: 1.647 s

9. middleware(validate.js)

PASS middlewares/**validate.test.js**

validate middleware

- ✓ calls next() when validation succeeds (30 ms)
- ✓ returns 400 when validation fails (5 ms)
- ✓ calls next(err) when JSON.parse(result.error.message) fails (9 ms)
- ✓ calls next(err) when schema.safeParse throws (1 ms)

File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	100	100	100	100	
validate.js	100	100	100	100	

Test Suites: 1 passed, 1 total

Tests: 4 passed, 4 total

Snapshots: 0 total

Time: 1.289 s

Ran all test suites matching middlewares/validate.test.js.

10. Utils(cloudinary.js)

PASS utils/**cloudinary.test.js**

cloudinary utils

- ✓ uploads an image with folder option (5 ms)
- ✓ uploads image without folder (1 ms)
- ✓ throws upload error (18 ms)
- ✓ exports cloudinary instance (1 ms)

File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	100	100	100	100	
...dinary.js	100	100	100	100	

Test Suites: 1 passed, 1 total

Tests: 4 passed, 4 total

Snapshots: 0 total

Time: 1.471 s

Ran all test suites matching utils/cloudinary.test.js.

11. Utils(emailTemplates.js)

```
PASS  utils/emailTemplates.test.js
emailTemplates utils
  verificationEmail()
    ✓ returns the correct subject (2 ms)
    ✓ includes email in the HTML content
    ✓ includes verifyUrl in both button & plaintext link (1 ms)
    ✓ contains expected structural HTML markers (1 ms)
    ✓ returns an object with subject & html keys (3 ms)
  passwordResetEmail()
    ✓ returns the correct subject (1 ms)
    ✓ includes email in the HTML
    ✓ includes verifyUrl in all relevant locations
    ✓ contains expected HTML structure markers (1 ms)
    ✓ returns an object with subject & html keys (1 ms)

-----|-----|-----|-----|-----|-----
File      | % Stmts | % Branch | % Funcs | % Lines | Uncovered Line #s
-----|-----|-----|-----|-----|-----
All files |    100 |    100   |    100   |    100   |
...plates.js |    100 |    100   |    100   |    100   |
-----|-----|-----|-----|-----|-----
Test Suites: 1 passed, 1 total
Tests:       10 passed, 10 total
Snapshots:   0 total
Time:        1.392 s
Ran all test suites matching utils/emailTemplates.test.js.
```

12. Utils(generate.js)

```
PASS  utils/generate.test.js
generate.js Gemini utilities
  ✓ binds geminiModel correctly (118 ms)
  ✓ returns text from generateWithGemini() (1 ms)
  ✓ supports custom model (1 ms)
  ✓ throws custom error on Gemini API failure (15 ms)

-----|-----|-----|-----|-----|-----
File      | % Stmts | % Branch | % Funcs | % Lines | Uncovered Line #s
-----|-----|-----|-----|-----|-----
All files |    100 |    100   |    100   |    100   |
generate.js |    100 |    100   |    100   |    100   |
-----|-----|-----|-----|-----|-----
Test Suites: 1 passed, 1 total
Tests:       4 passed, 4 total
Snapshots:   0 total
Time:        1.426 s
Ran all test suites matching utils/generate.test.js.
```

13. Utils(mapping.js)

PASS utils/mapping.test.js

langMap utility

- ✓ contains all expected language keys (4 ms)
- ✓ maps each shorthand to its correct full language name (2 ms)
- ✓ contains no unexpected keys (1 ms)
- ✓ matches the snapshot (5 ms)
- ✓ returns correct language for dynamic key access (2 ms)

File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	100	100	100	100	
mapping.js	100	100	100	100	

Test Suites: 1 passed, 1 total

Tests: 5 passed, 5 total

Snapshots: 1 passed, 1 total

Time: 1.316 s

Ran all test suites matching utils/mapping.test.js.

14. Utils(schemaHelpers)

PASS utils/schemaHelpers.test.js

buildRoadmapSchema()

- ✓ returns an object schema (2 ms)
- ✓ contains all top-level properties (2 ms)
- ✓ defines chapter schema correctly (2 ms)
- ✓ defines subtopic schema correctly (2 ms)
- ✓ returns a stable deterministic schema (snapshot) (6 ms)

File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	100	100	100	100	
...elpers.js	100	100	100	100	

Test Suites: 1 passed, 1 total

Tests: 5 passed, 5 total

Snapshots: 1 passed, 1 total

Time: 1.261 s

Ran all test suites matching utils/schemaHelpers.test.js.

15. Utils(Prompt.js)

PASS utils/prompt.test.js

prompt.js utility tests

- ✓ getRoadmapPrompt() inserts topic and returns required sections (3 ms)
- ✓ quizPrompt() creates subtopic quiz prompt (1 ms)
- ✓ quizPrompt() throws error if chapter not found (13 ms)
- ✓ quizPrompt() throws error if subtopic not found (2 ms)
- ✓ quizPrompt() generates whole-chapter quiz prompt when no subtopicId (1 ms)
- ✓ quizPrompt() throws error if chapter missing (no subtopicId mode) (1 ms)
- ✓ getSubtopicSummaryPrompt() fills in all fields correctly (1 ms)
- ✓ getAnalysePrompt() inserts code and JSON fields (1 ms)
- ✓ getTitlePrompt() inserts userDescription
- ✓ getResponsePrompt() inserts message and context (1 ms)
- ✓ getTopicGuardPrompt() contains topic and instructions (1 ms)
- ✓ quizPrompt() handles missing roadmapData by using empty chapters (covers branch) (1 ms)
- ✓ quizPrompt() handles chapter with missing subtopics array (covers fallback branch)

File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s
All files	100	100	100	100	
prompt.js	100	100	100	100	

Test Suites: 1 passed, 1 total
Tests: 13 passed, 13 total
Snapshots: 0 total
Time: 1.355 s

16. Utils(search.js)

```
PASS  utils/search.test.js
search.js utility tests
  ✓ returns filtered article links for allowed domains (max 3 per domain) (5 ms)
  ✓ returns empty array when domains do not match (1 ms)
  ✓ returns [] on SERPER API failure (35 ms)
  ✓ works even without recommendedArticleSites (branch) (1 ms)
  ✓ returns article links for each subtopic (3 ms)
  ✓ returns structured video links for each subtopic (2 ms)
  ✓ handles empty video API response (1 ms)
  ✓ skips invalid URLs and hits the catch-continue branch (1 ms)
  ✓ returns [] when SERPER returns no organic results (covers fallback branch)
  ✓ returns [] when SERPER video response has no organic array (1 ms)

-----|-----|-----|-----|-----|-----
File      | % Stmts | % Branch | % Funcs | % Lines | Uncovered Line #s
-----|-----|-----|-----|-----|-----
All files |    100 |    100   |    100   |    100   |
search.js |    100 |    100   |    100   |    100   |
-----|-----|-----|-----|-----|

Test Suites: 1 passed, 1 total
Tests:       10 passed, 10 total
Snapshots:   0 total
Time:        1.67 s
Ran all test suites matching utils/search.test.js.
```

17. Utils(urlHelpers.js)

```
PASS  utils/urlHelpers.test.js
urlHelpers.js
  ✓ buildVerifyAccountUrl() creates correct URL (3 ms)
  ✓ buildResetPasswordUrl() creates correct URL (1 ms)
  ✓ buildGoogleAuthUrl() returns valid Google OAuth URL (1 ms)
  ✓ buildGithubAuthUrl() returns valid GitHub OAuth URL (1 ms)
  ✓ buildGoogleTokenParams() returns correct URLSearchParams (1 ms)
  ✓ buildGithubTokenParams() returns correct serialized param string (1 ms)
  ✓ buildEmailVerifyUrl() builds correct email verification URL (1 ms)

-----|-----|-----|-----|-----|-----
File      | % Stmts | % Branch | % Funcs | % Lines | Uncovered Line #s
-----|-----|-----|-----|-----|-----
All files |    100 |    100 |    100 |    100 |
...elpers.js |    100 |    100 |    100 |    100 |
-----|-----|-----|-----|-----|-----

Test Suites: 1 passed, 1 total
Tests:       7 passed, 7 total
Snapshots:   0 total
Time:        1.331 s
Ran all test suites matching utils/urlHelpers.test.js.
```

18. Config(mailer.js)

```
PASS  config/mailer.test.js
mailer.js - SendGrid mailer tests
  ✓ calls sgMail.setApiKey() and sgMail.send() successfully (6 ms)
  ✓ logs an error when sgMail.send rejects (2 ms)
  ✓ verifyEmailTransporter() calls setApiKey() and logs success (4 ms)
  ✓ verifyEmailTransporter() logs error when setApiKey throws (1 ms)

-----|-----|-----|-----|-----|-----
File      | % Stmts | % Branch | % Funcs | % Lines | Uncovered Line #s
-----|-----|-----|-----|-----|-----
All files |    100 |    100 |    100 |    100 |
mailer.js |    100 |    100 |    100 |    100 |
-----|-----|-----|-----|-----|-----

Test Suites: 1 passed, 1 total
Tests:       4 passed, 4 total
Snapshots:   0 total
Time:        1.428 s
Ran all test suites matching config/mailer.test.js.
```

19. All Files

All files	99.79	98.56	100	99.78	
config	100	100	100	100	
mailer.js	100	100	100	100	
controllers	99.75	98.38	100	99.74	
Auth.js	98.81	96.72	100	98.8	210,242
...oller.js	100	100	100	100	
...oller.js	100	90	100	100	34
Roadmap.js	100	100	100	100	
...oller.js	100	98.07	100	100	221
...oller.js	100	98.38	100	100	105
...oller.js	100	100	100	100	
middlewares	100	100	100	100	
userAuth.js	100	100	100	100	
validate.js	100	100	100	100	
models	100	100	100	100	
...Model.js	100	100	100	100	
...Model.js	100	100	100	100	
...Model.js	100	100	100	100	
...Model.js	100	100	100	100	
...Model.js	100	100	100	100	
utils	100	100	100	100	
...inary.js	100	100	100	100	
...lates.js	100	100	100	100	
generate.js	100	100	100	100	
mapping.js	100	100	100	100	
prompt.js	100	100	100	100	
...lpers.js	100	100	100	100	
search.js	100	100	100	100	
...lpers.js	100	100	100	100	
-----	-----	-----	-----	-----	
Test Suites: 65 passed, 65 total					
Tests: 390 passed, 390 total					

20. Index.html

config/mailer.js	0%		0	0	0	100%		2	0	2	100%		11	0	11
controllers/Auth.js	97%		59	2	61	100%		10	0	10	99%		166	2	168
controllers/ChatController.js	100%		8	0	8	100%		7	0	7	100%		61	0	61
controllers/CodeController.js	90%		9	1	10	100%		4	0	4	100%		21	0	21
controllers/Roadmap.js	100%		76	0	76	100%		18	0	18	100%		234	0	234
controllers/S3Controller.js	98%		51	1	52	100%		15	0	15	100%		119	0	119
controllers/UserController.js	98%		61	1	62	100%		10	0	10	100%		125	0	125
controllers/oAuthController.js	100%		41	0	41	100%		6	0	6	100%		60	0	60
middlewares/userAuth.js	100%		4	0	4	100%		1	0	1	100%		13	0	13
middlewares/validate.js	100%		2	0	2	100%		2	0	2	100%		11	0	11
models/ChatModel.js	0%		0	0	0	0%		0	0	0	100%		2	0	2
models/NoteModel.js	0%		0	0	0	0%		0	0	0	100%		3	0	3
models/QuizModel.js	0%		0	0	0	0%		0	0	0	100%		2	0	2
models/RoadmapModel.js	0%		0	0	0	0%		0	0	0	100%		2	0	2
models/UserModel.js	100%		2	0	2	0%		0	0	0	100%		3	0	3
utils/cloudinary.js	100%		1	0	1	100%		1	0	1	100%		2	0	2
utils/emailTemplates.js	0%		0	0	0	100%		2	0	2	100%		4	0	4
utils/generate.js	100%		1	0	1	100%		1	0	1	100%		7	0	7
utils/mapping.js	0%		0	0	0	0%		0	0	0	100%		1	0	1
utils/prompt.js	100%		12	0	12	100%		11	0	11	100%		25	0	25
utils/schemaHelpers.js	0%		0	0	0	100%		1	0	1	100%		1	0	1
utils/search.js	100%		16	0	16	100%		10	0	10	100%		50	0	50
utils/urlHelpers.js	0%		0	0	0	100%		7	0	7	100%		27	0	27

98.56% Branches 343/348 100% Functions 108/108 99.78% Lines 950/952

Files: Tree Flat Filter: Low Medium High

all files

	Branches				Functions				Lines						
File ▾	% ▴	Covered ▴	Missed ▴	Total ▴	% ▴	Covered ▴	Missed ▴	Total ▴	% ▴	Covered ▴	Missed ▴	Total ▴			
+ config	0%		0	0	0	100%	<div></div>	2	0	2	100%	<div></div>	11	0	11
+ controllers	98%	<div></div>	305	5	310	100%	<div></div>	70	0	70	100%	<div></div>	786	2	788
+ middlewares	100%	<div></div>	6	0	6	100%	<div></div>	3	0	3	100%	<div></div>	24	0	24
+ models	100%	<div></div>	2	0	2	0%		0	0	0	100%	<div></div>	12	0	12
+ utils	100%	<div></div>	30	0	30	100%	<div></div>	33	0	33	100%	<div></div>	117	0	117