

EventHub API Documentation

Version: 1.1.0

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Last Updated: 4th February 2026

How to Generate PDF

To export this documentation as a PDF (required for submission):

Option 1: Using Pandoc (Recommended)

```
pandoc docs/API_DOCUMENTATION.md -o docs/API_DOCUMENTATION.pdf --pdf-engine=xelatex
```

Option 2: VS Code

1. Install "Markdown PDF" extension
2. Open this file → Ctrl+Shift+P → "Markdown PDF: Export (pdf)"

Option 3: Browser

1. Open in any Markdown viewer
 2. Print to PDF (Ctrl+P → Save as PDF)
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Base URLs

Environment	URL
Production	https://comp3011-cw1-api.onrender.com
Local Development	http://127.0.0.1:8000

Interactive Documentation:

- Swagger UI: `/docs`
 - ReDoc: `/redoc`
-

Authentication

Most endpoints that modify data (POST, PATCH, DELETE) require a valid JWT token. Read operations (GET) are generally public.

Auth Flow Summary

1. POST /auth/register → Create account
2. POST /auth/login → Receive JWT token
3. Include token in requests: Authorization: Bearer <token>

Register a New User

Endpoint: POST /auth/register

Auth Required: No

Request Body:

```
{
  "username": "johndoe",
  "email": "john@example.com",
  "password": "mySecurePassword123"
}
```

Success Response (201 Created):

```
{
  "id": 1,
  "username": "johndoe",
  "email": "john@example.com",
  "created_at": "2026-02-04T12:30:00Z"
}
```

Error Responses:

Status	Meaning
400 Bad Request	Username or email already registered
422 Unprocessable Entity	Validation failed (e.g., password too short)

Login

Endpoint: POST /auth/login

Auth Required: No

Content-Type: application/x-www-form-urlencoded

Request Body (Form Data):

```
username=johndoe
password=mySecurePassword123
```

Success Response (200 OK):

```
{
  "access_token": "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9...",
  "token_type": "bearer"
}
```

Error Response (401 Unauthorized):

```
{
  "detail": "Incorrect username or password"
}
```

Using the Token

Include the token in the `Authorization` header for all protected requests:

```
Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9...
```

Token Expiry: 30 minutes

Events

List Events

Endpoint: `GET /events`

Auth Required: No

Query Parameters:

Parameter	Type	Description	Example
limit	integer	Max results (default: 10, max: 100)	?limit=20
offset	integer	Skip N results (default: 0)	?offset=10
sort	string	Sort field, prefix - for desc	?sort=-start_time
q	string	Search title (partial match)	?q=tech
location	string	Filter by location	?location=Leeds
start_after	datetime	Events starting after	?start_after=2026-03-01T00:00:00
start_before	datetime	Events starting before	?start_before=2026-04-01T00:00:00
min_capacity	integer	Minimum capacity	?min_capacity=50
status	string	upcoming OR past	?status=upcoming

Example Request:

```
GET /events?limit=5&sort=-start_time&status=upcoming
```

Success Response (200 OK):

```
{
  "items": [
    {
      "id": 1,
      "title": "Tech Meetup Leeds",
      "description": "Monthly gathering for tech enthusiasts",
      "location": "Leeds Digital Hub",
      "start_time": "2026-03-15T18:00:00Z",
      "end_time": "2026-03-15T21:00:00Z",
      "capacity": 50,
    }
  ]
}
```

```
    "created_at": "2026-02-01T10:00:00Z"
  }
],
"total": 42,
"limit": 5,
"offset": 0
}
```

Create Event

Endpoint: POST /events

Auth Required: Yes

Request Body:

```
{
  "title": "Freshers Welcome Social",
  "description": "Welcome event for new students at Leeds University.",
  "location": "Leeds Student Union, Riley Smith Hall",
  "start_time": "2026-09-25T19:00:00Z",
  "end_time": "2026-09-25T23:00:00Z",
  "capacity": 200
}
```

Validation Rules:

Field	Rules
title	Required, 1–200 characters
description	Optional, max 1000 characters
location	Required, 1–200 characters
start_time	Required, ISO 8601 datetime
end_time	Required, must be after start_time
capacity	Required, integer ≥ 1

Success Response (201 Created):

```
{
  "id": 2,
  "title": "Freshers Welcome Social",
  "description": "Welcome event for new students at Leeds University.",
  "location": "Leeds Student Union, Riley Smith Hall",
  "start_time": "2026-09-25T19:00:00Z",
  "end_time": "2026-09-25T23:00:00Z",
  "capacity": 200,
  "created_at": "2026-02-04T14:00:00Z"
}
```

Get Event by ID

Endpoint: GET /events/{id}

Auth Required: No

Success Response (200 OK): Returns single event object.

Error Response (404): {"detail": "Event not found"}

Update Event

Endpoint: PATCH /events/{id}

Auth Required: Yes

Request Body (partial update):

```
{
  "title": "Tech Meetup Leeds 2026",
  "capacity": 75
}
```

Only include fields you want to update.

Delete Event

Endpoint: DELETE /events/{id}

Auth Required: Yes

Success Response: 204 No Content

Get Event Statistics

Endpoint: GET /events/{id}/stats

Auth Required: No

Success Response (200 OK):

```
{
  "event_id": 1,
  "going": 35,
  "maybe": 10,
  "not_going": 5,
  "remaining_capacity": 15
}
```

Formula: remaining_capacity = capacity - going

Attendees

Create Attendee

Endpoint: POST /attendees

Auth Required: Yes

Request Body:

```
{
  "name": "Alice Smith",
```

```
"email": "alice.smith@leeds.ac.uk"
}
```

Success Response (201 Created):

```
{
  "id": 1,
  "name": "Alice Smith",
  "email": "alice.smith@leeds.ac.uk"
}
```

Error: 409 Conflict if email already registered.

Get Attendee by ID

Endpoint: GET /attendees/{id}

Auth Required: No

Get Events for Attendee

Endpoint: GET /attendees/{id}/events

Auth Required: No

Returns all events the attendee has RSVP'd to.

RSVPs

Create RSVP

Endpoint: POST /events/{event_id}/rsvps

Auth Required: Yes

Request Body:

```
{
  "attendee_id": 1,
  "status": "going"
}
```

Valid status values: going , maybe , not_going

Error Responses:

- 404 – Event or attendee not found
 - 409 – Duplicate RSVP (attendee already RSVP'd to this event)
-

List RSVPs for Event

Endpoint: GET /events/{event_id}/rsvps

Auth Required: No

Delete RSVP

Endpoint: DELETE /events/{event_id}/rsvps/{rsvp_id}

Auth Required: Yes

Analytics & Recommendations

These endpoints provide derived insights beyond basic CRUD operations.

Event Seasonality

Endpoint: GET /analytics/events/seasonality

Auth Required: No

Purpose: Aggregate events by month to identify seasonal patterns.

Success Response (200 OK):

```
{
  "items": [
    {"month": "2026-01", "count": 5, "top_categories": ["General"]},
    {"month": "2026-02", "count": 12, "top_categories": ["General"]},
    {"month": "2026-03", "count": 8, "top_categories": ["General"]}
  ]
}
```

Trending Events

Endpoint: GET /analytics/events/trending

Auth Required: No

Query Parameters:

Parameter	Type	Default	Description
window_days	integer	30	Days to consider for "recent" RSVPs
limit	integer	5	Max events to return

Trending Score Formula:

score = (recent_rsvps × 1.5) + (total_rsvps × 0.5)

Success Response (200 OK):

```
[
  {
    "event_id": 3,
    "title": "AI Workshop",
    "trending_score": 15.5,
    "recent_rsvps": 8
  },
  {
    "event_id": 7,
    "title": "Networking Night",
    "trending_score": 12.0,
    "recent_rsvps": 6
  }
]
```

Personalised Recommendations

Endpoint: GET /events/recommendations

Auth Required: Yes

Purpose: Suggest upcoming events based on user's RSVP history.

Algorithm:

1. Find attendee record matching the authenticated user's email.
2. Identify locations the user has previously attended.
3. Recommend future events at those locations.
4. Cold start: If no history, return top upcoming events.

Success Response (200 OK):

```
{
  "recommendations": [
    {
      "event_id": 12,
      "title": "Python Meetup",
      "score": 0.9,
      "reason": "Based on your interest in Leeds Digital Hub",
      "location": "Leeds Digital Hub",
      "start_time": "2026-03-20T18:00:00Z"
    }
  ],
  "user_id": 5
}
```

Error Response Format

All error responses follow a consistent format:

```
{
  "detail": "Human-readable error message"
}
```

For validation errors (422):

```
{
  "detail": [
    {
      "loc": ["body", "capacity"],
      "msg": "Input should be greater than or equal to 1",
      "type": "greater_than_equal"
    }
  ]
}
```

HTTP Status Codes Summary

Code	Meaning	When Used
200	OK	Successful GET, PATCH
201	Created	Successful POST

Code	Meaning	When Used
204	No Content	Successful DELETE
400	Bad Request	Invalid data (duplicate username)
401	Unauthorized	Missing/invalid JWT
404	Not Found	Resource doesn't exist
409	Conflict	Duplicate entry
422	Unprocessable Entity	Validation failed
500	Internal Server Error	Unexpected error

Running Locally

Prerequisites

- Python 3.11+
- pip

Setup

```
# Clone repository
git clone https://github.com/NathS04/comp3011-cw1-api.git
cd comp3011-cw1-api

# Create virtual environment
python -m venv venv
source venv/bin/activate # Windows: venv\Scripts\activate

# Install dependencies
pip install -r requirements.txt

# Set environment variables
export DATABASE_URL="sqlite:///./app.db"
export SECRET_KEY="your-secret-key"

# Run migrations
alembic upgrade head

# Start server
uvicorn app.main:app --reload
```

Running Tests

```
pytest -v
```

Demo Script (cURL)

```
# 1. Health check
curl http://127.0.0.1:8000/health
```

```
# 2. Register
curl -X POST http://127.0.0.1:8000/auth/register \
  -H "Content-Type: application/json" \
  -d '{"username":"demo","email":"demo@test.com","password":"password123"}'

# 3. Login
TOKEN=$(curl -s -X POST http://127.0.0.1:8000/auth/login \
  -d "username=demo&password=password123" | jq -r '.access_token')

# 4. Create event
curl -X POST http://127.0.0.1:8000/events \
  -H "Authorization: Bearer $TOKEN" \
  -H "Content-Type: application/json" \
  -d '{"title":"Demo Event","location":"Leeds","start_time":"2026-03-01T10:00:00","end_time":"2026-03-01T12:00:00","capacity":50}'

# 5. Get trending
curl http://127.0.0.1:8000/analytics/events/trending

# 6. Get recommendations
curl -H "Authorization: Bearer $TOKEN" http://127.0.0.1:8000/events/recommendations
```

Changelog

Version	Date	Changes
1.1.0	2026-02-04	Added analytics and recommendations endpoints
1.0.0	2026-02-01	Initial release