CS 203: Software Tools & Techniques for AI - Assignment 1

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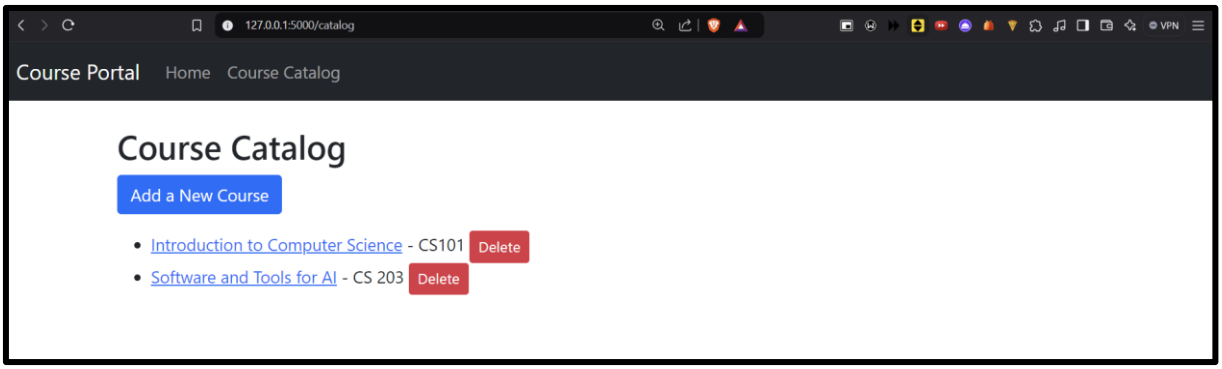
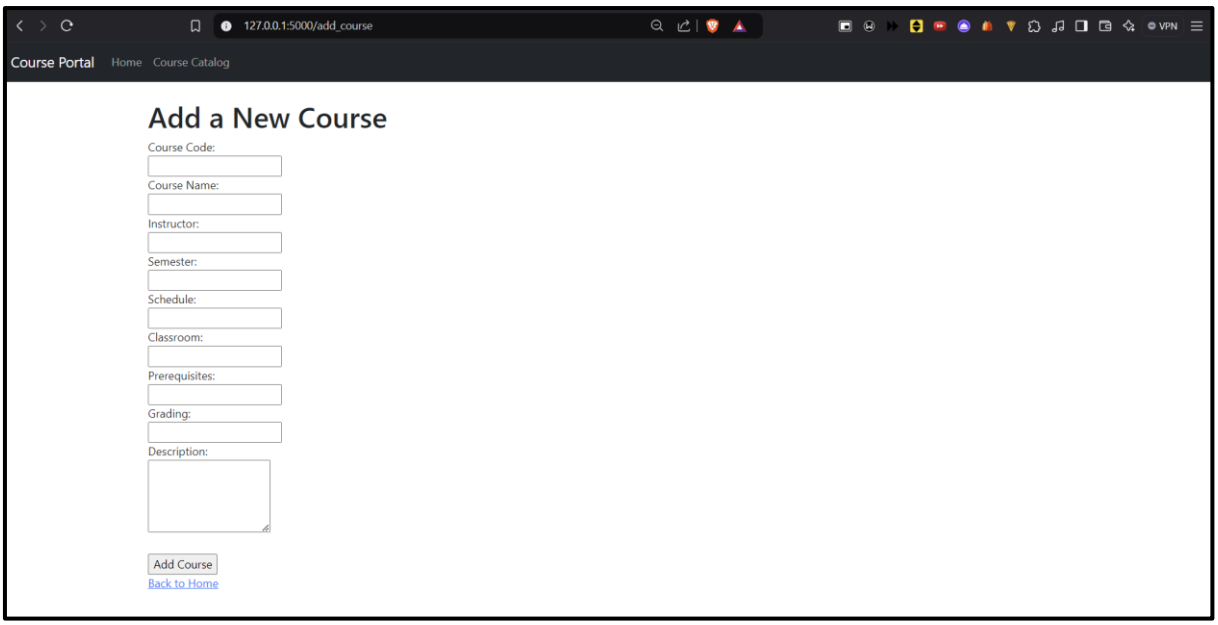
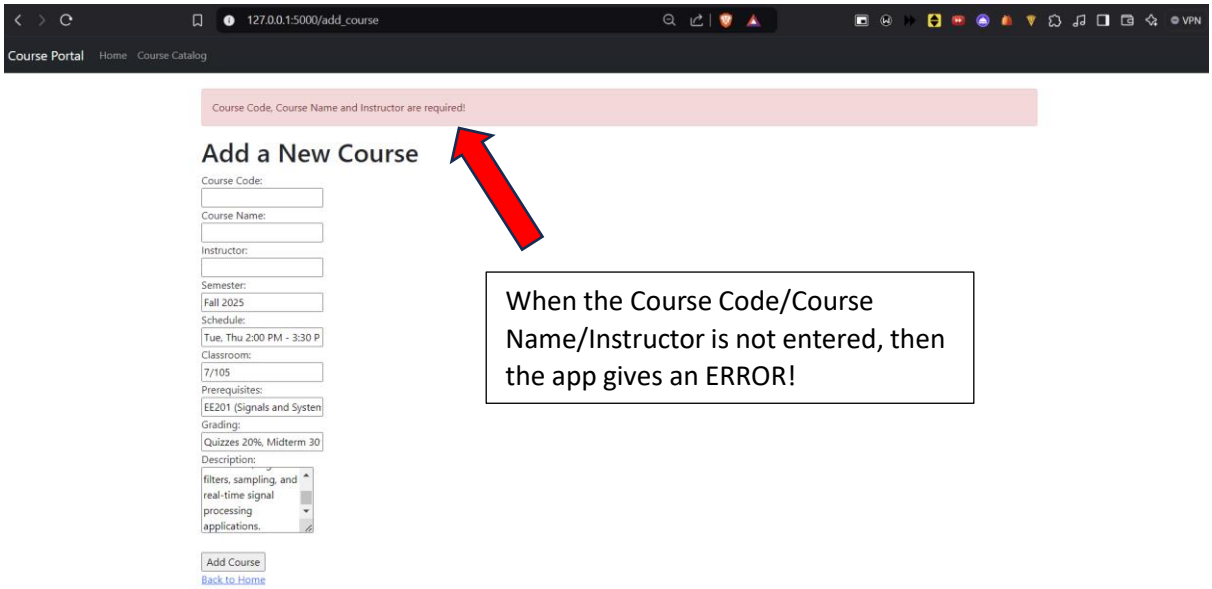
GitHub Repository Link: https://github.com/VanshOnGit/CS-203-Assignment-1

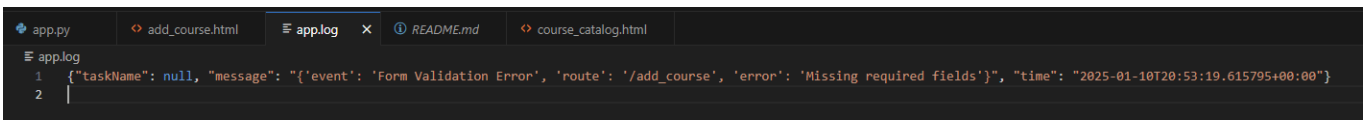
1. Add Courses to the Catalog



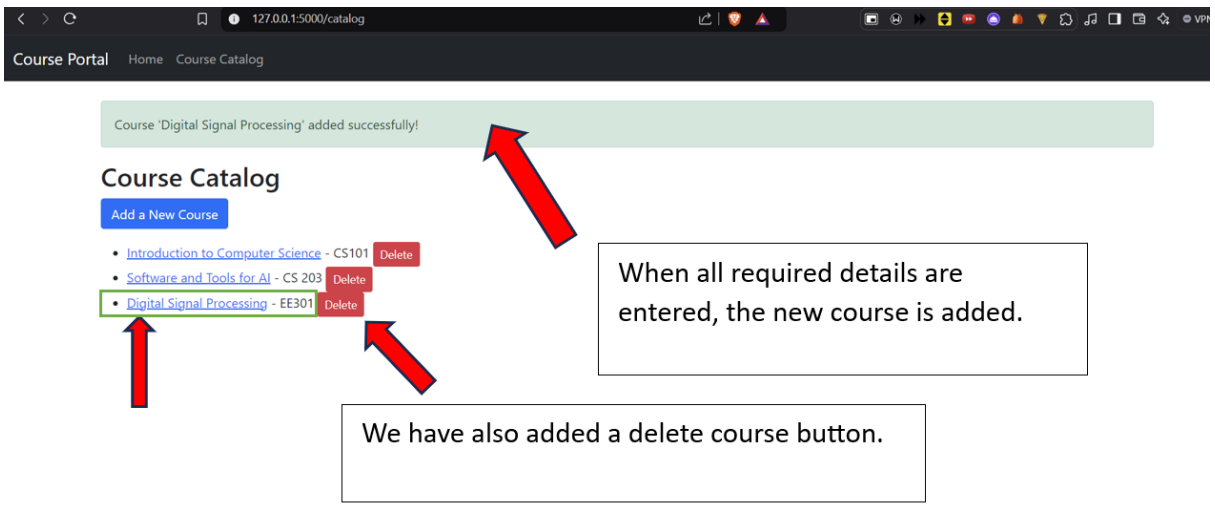




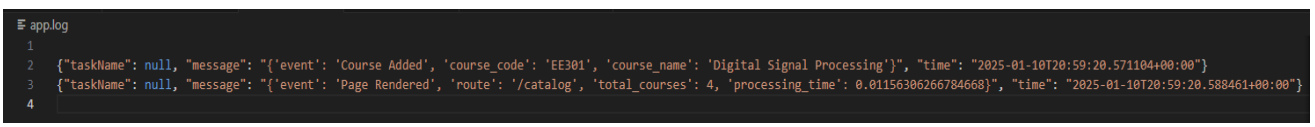
Error log message



Adding the course



Course_add log

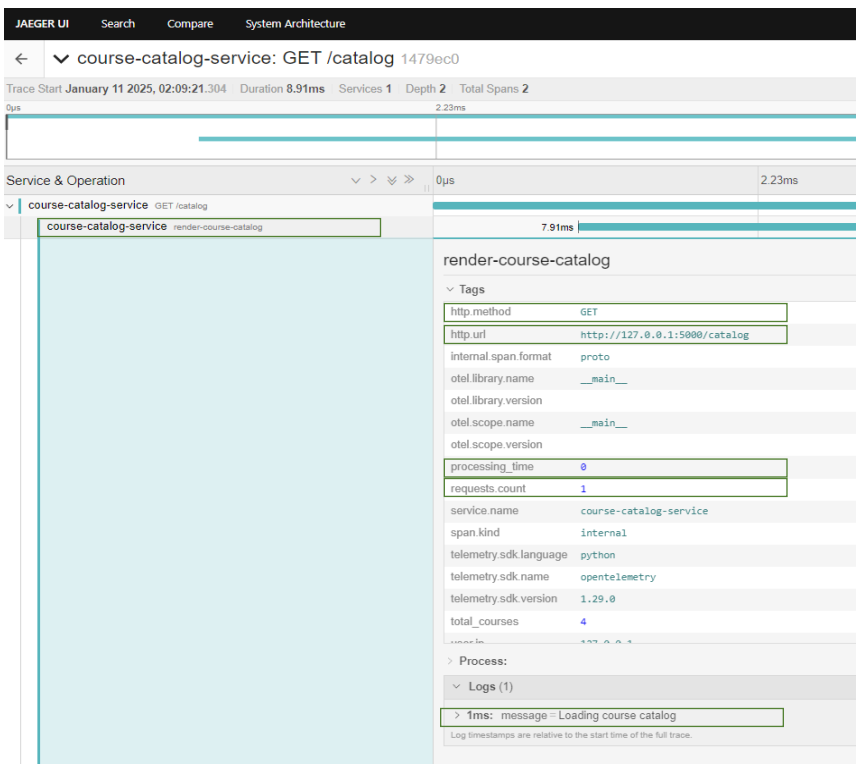


OpenTelemetry Tracing, Exporting Data to Jaeger and Python Logging

render-course-catalog span is added to display operations in Course Catalog

```python
@app.route('/catalog')
def course_catalog():
    start_time = time.time()  # measure processing time
    requests_count['catalog'] += 1  # increment route requests count

    with tracer.start_as_current_span("render-course-catalog") as span:
        span.set_attribute("http.method", request.method)  # log HTTP method
        span.set_attribute("http.url", request.url)  # log request URL
        span.set_attribute("user.ip", request.remote_addr)  # log user IP
        span.set_attribute("requests.count", requests_count['catalog'])  # log request count
        span.add_event("Loading course catalog")  # log event: catalog loading

        courses = load_courses()  # load courses from JSON
        span.set_attribute("total_courses", len(courses))  # log number of courses
        span.set_attribute("processing_time", time.time() - start_time)  # log processing time

        logger.info({
            "event": "Page Rendered",  # page render event
            "route": "/catalog",  # accessed route
            "total_courses": len(courses),  # number of courses
            "processing_time": time.time() - start_time  # time taken
        })

        return render_template('course_catalog.html', courses=courses)  # render catalog page
```

render-course-catalog span **Jaeger**



course_catalog span **Logging**

app.py | add_course.html | app.log | index.html | course_catalog.html

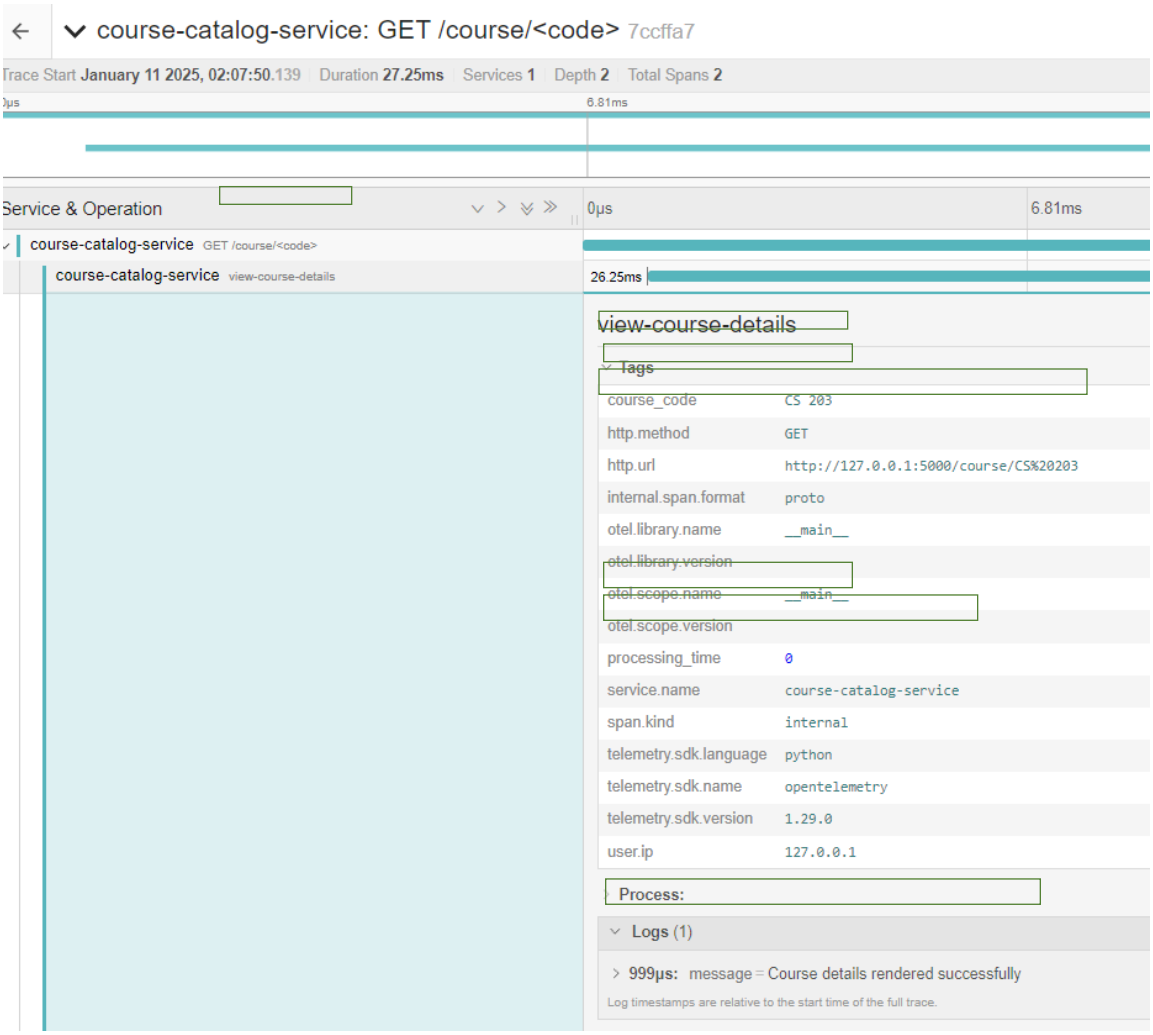
app.log


```
{"taskName": null, "message": "{'event': 'Page Rendered', 'route': '/catalog', 'total_courses': 4, 'processing_time': 0.0}", "time": "2025-01-10T21:57:55.827451+00:00"}
```


view-course-details span is added to track the retrieval & rendering of course_details

```python
@app.route('/course/<code>')
def course_details(code):
    start_time = time.time()  # start timer
    with tracer.start_as_current_span("view-course-details") as span:
        span.set_attribute("http.method", request.method)  # log HTTP method
        span.set_attribute("http.url", request.url)  # log request URL
        span.set_attribute("user.ip", request.remote_addr)  # log user IP
        span.set_attribute("course_code", code)  # log course code

        courses = load_courses()  # load courses from JSON
        course = next((course for course in courses if course['code'] == code), None)  # find course

        if not course:  # if course not found
            error_count['course_details'] += 1  # increment error count
            span.add_event("Course not found")  # log missing course
            span.set_attribute("error_count", error_count['course_details'])  # log error count

            logger.error({
                "event": "Course Not Found",  # log event
                "route": "/course/<code>",  # log route
                "course_code": code  # log course code
            })

            flash(f"No course found with code '{code}'.", "error")  # show error message
            return redirect(url_for('course_catalog'))  # redirect to catalog

        span.add_event("Course details rendered successfully")  # log render success
        span.set_attribute("processing_time", time.time() - start_time)  # log time taken

        logger.info({
            "event": "Course Details Rendered",  # log event
            "course_code": course['code'],  # log course code
            "processing_time": time.time() - start_time  # log processing time
        })

        return render_template('course_details.html', course=course)  # render course details page
```

view-course-details span **Jaeger**



Viewing course details Logging

app.log

```
{"taskName": null, "message": "{'event': 'Course Details Rendered', 'course_code': 'CS101', 'processing_time': 0.00099945068359375}", "time": "2025-01-10T21:49:29.697039+00:00"}
```

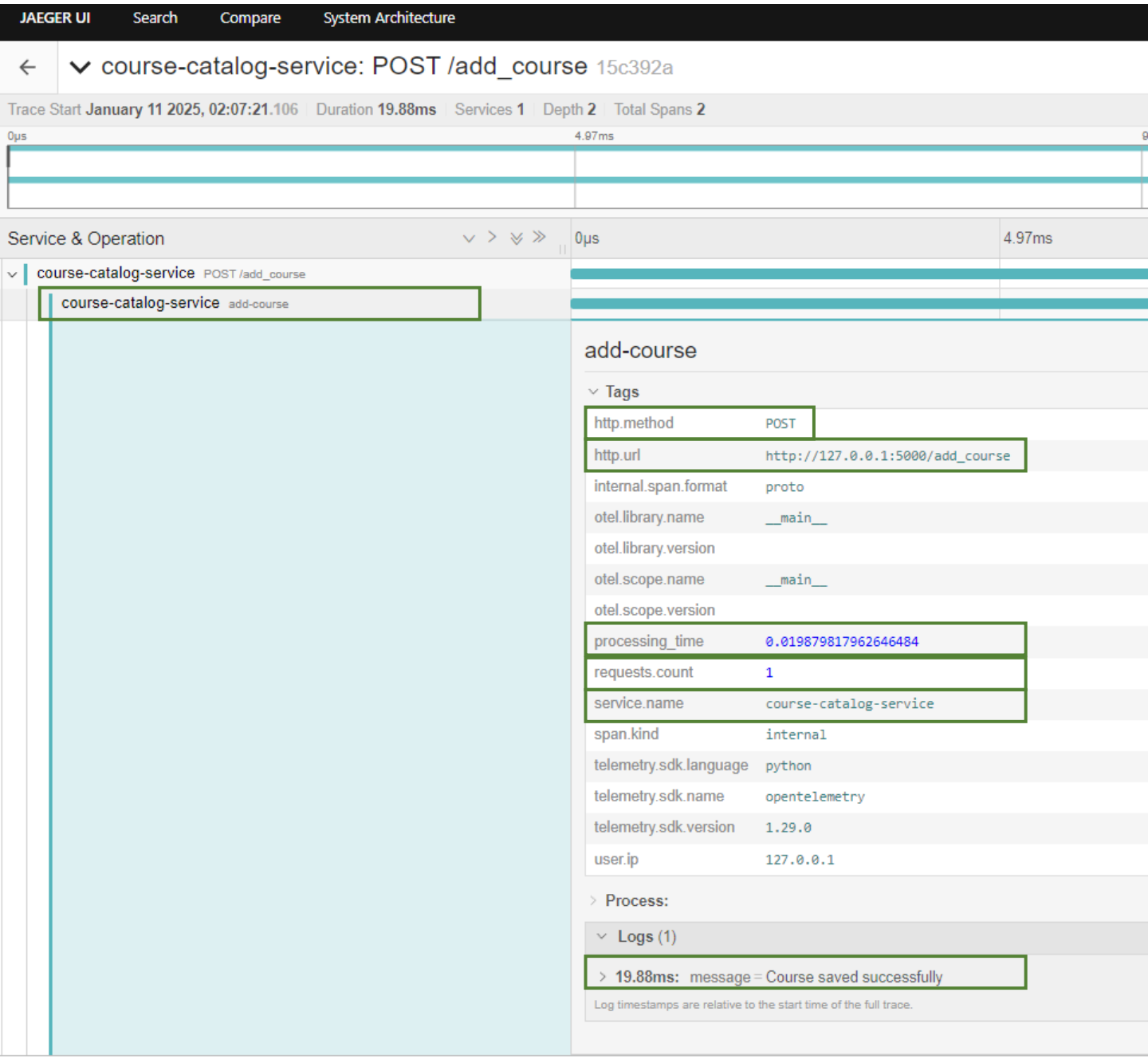
Please Move to Next Page

Please Move to Next Page

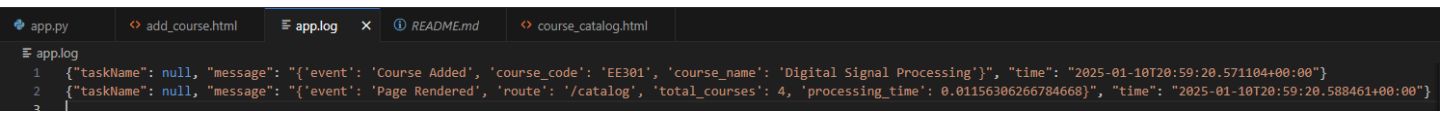
add-course span is added to trace the course addition process

```
@app.route('/add_course', methods=['GET', 'POST'])
def add_course():
    start_time = time.time()  # start timer
    requests_count['add_course'] += 1  # count add requests
    with tracer.start_as_current_span("add-course") as span:
        span.set_attribute("http.method", request.method)  # log HTTP method
        span.set_attribute("http.url", request.url)  # log request URL
        span.set_attribute("user.ip", request.remote_addr)  # log user IP
        span.set_attribute("requests.count", requests_count['add_course'])  # log request count

        if request.method == 'POST':  # check if form submitted
            course = {
                'code': request.form.get('code', '').strip(),  # get course code
                'name': request.form.get('name', '').strip(),  # get course name
                'instructor': request.form.get('instructor', '').strip(),  # get instructor
                'semester': request.form.get('semester', '').strip(),  # get semester
                'schedule': request.form.get('schedule', '').strip(),  # get schedule
                'classroom': request.form.get('classroom', '').strip(),  # get classroom
                'prerequisites': request.form.get('prerequisites', '').strip(),  # get prerequisites
                'grading': request.form.get('grading', '').strip(),  # get grading info
                'description': request.form.get('description', '').strip()  # get description
            }

            if not course['code'] or not course['name'] or not course['instructor']:  # check required fields
                error_count['add_course'] += 1  # count errors
                span.add_event("Validation failed: Missing required fields")  # log validation error
                span.set_attribute("error_count", error_count['add_course'])  # log error count

                logger.warning({
                    "event": "Form Validation Error",  # log form error
                    "route": "/add_course",  # log route
                    "error": "Missing required fields"  # log error reason
                })

                flash('Course Code, Course Name and Instructor are required!', 'error')  # show error
                return render_template('add_course.html')  # reload form

            save_courses(course)  # save course data
            span.add_event("Course saved successfully")  # log save success
            span.set_attribute("processing_time", time.time() - start_time)  # log time taken
            logger.info({
                "event": "Course Added",  # log add event
                "course_code": course['code'],  # log course code
                "course_name": course['name']  # log course name
            })
            flash(f"Course '{course['name']}' added successfully!", "success")  # show success message
            return redirect(url_for('course_catalog'))  # go to catalog

        return render_template('add_course.html')  # show add form
```

add-course span **Jaeger**



add-course Logging



Thank You
CS203 Assignment 1

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