

# COURSE PORTFOLIO

Study Program : MATHEMATICS - S1  
Semester : ODD 2023/2024  
Course Code : 23H01130503  
Course Name : Boundary Element Method  
Coordinator : Prof. Dr. Moh. Ivan AZ., M.Sc.  
Lecturer Team Member : Prof. Dr. Moh. Ivan AZ., M.Sc.

## Implementation of Learning

Description of the implementation of the lecture, the suitability of what was planned in the RPS with what was done:

### Number and percentage of lecturer and student attendance

(data source: monitoring the attendance of lecturers and students)

| Lecturer Attendance     |  | Student Attendance   |
|-------------------------|--|--|
| Boundary Element Method | Prof. Dr. Moh. Ivan AZ., M.Sc. : times<br>Total Meeting : times. | Number of students: 6 persons<br>Presence $\geq$ 80% :<br>Presence $<$ 80% : |

## Materials/practicum provided

1. Boundary value problems with ordinary differential equations and Green's functions UI", Oxygen, Ubuntu, Cantarell, "Fira Sans", "Droid Sans", "Helvetica Neue", sans-serif;">2. Approximation techniques for the solution of boundary value problems
3. Transformation of differential equations into boundary integral equations
4. Discretization of boundary integral equations into elements; element type
5. Unit normal vector pointing outward, numerical integral
6. Formation of systems of linear equations and solution techniques
7. Boundary element method solution

## The learning methods implemented

1. Collaborative Learning
2. Discovery Learning
3. Case Study

## The assessment method implemented

1. Quiz

2. Case Studies
3. Short Q&A
4. Mid Test
5. Independent Assignment

**Supplementary information (if available)**

None

**2. Learning Outcomes**

**Measurement results of CLO**

Assessment and Evaluation of Student Achievement of CLO<sup>a</sup>

| <b>LOs that are charged to the Course</b> | <b>CLO</b> | <b>Assessment Form</b> | <b>Weight</b> | <b>Average student score (0-100)</b> |
|---|------------|------------------------|---------------|--------------------------------------|
| KU2                                       | CLO-3      | Case Studies           | 10.00 %       | 82.62                                |
| KU2                                       | CLO-3      | Quiz                   | 5.00 %        | 81.89                                |
| KU2                                       | CLO-4      | Case Studies           | 10.00 %       | 83.11                                |
| KU2                                       | CLO-4      | Independent Assignment | 3.00 %        | 82.25                                |
| KK3                                       | CLO-3      | Case Studies           | 10.00 %       | 82.62                                |
| KK3                                       | CLO-3      | Quiz                   | 5.00 %        | 81.89                                |
| KK3                                       | CLO-4      | Case Studies           | 10.00 %       | 83.11                                |
| KK3                                       | CLO-4      | Independent Assignment | 3.00 %        | 82.25                                |
| KK2                                       | CLO-2      | Mid Test               | 20.00 %       | 85.78                                |
| KK2                                       | CLO-2      | Quiz                   | 5.00 %        | 80.84                                |
| KK2                                       | CLO-2      | Case Studies           | 10.00 %       | 83.09                                |
| KK2                                       | CLO-3      | Quiz                   | 5.00 %        | 81.89                                |
| KK2                                       | CLO-3      | Case Studies           | 10.00 %       | 82.62                                |
| KK2                                       | CLO-4      | Independent Assignment | 3.00 %        | 82.25                                |
| KK2                                       | CLO-4      | Case Studies           | 10.00 %       | 83.11                                |
| P2  | CLO-1      | Case Studies           | 10.00 %       | 81.84                                |
| P2  | CLO-1      | Independent Assignment | 5.00 %        | 84.87                                |
| P2  | CLO-1      | Short Q&A              | 2.00 %        | 85.31                                |
| P2  | CLO-2      | Quiz                   | 5.00 %        | 80.84                                |
| P2  | CLO-2      | Case Studies           | 10.00 %       | 83.09                                |
| P2  | CLO-2      | Mid Test               | 20.00 %       | 85.78                                |

a: result criteria: very satisfactory if the average score is  $\geq 80$ ; satisfactory if the average score is 70 - 79.9; unsatisfactory if the average score is  $< 70$ .

### Percentage of students who achieved a very satisfactory CLO score<sup>b</sup>

(data source: student scores per assessment according to CLOs)

| CLO   | % of students who achieved a CLO score of at least 80 |
|-------|---|
| CLO-1 | 83.33%  |
| CLO-2 | 100.00%   |
| CLO-3 | 50.00%  |
| CLO-4 | 83.33%  |

b: result criteria: very satisfactory if  $\geq 80\%$  of students score  $\geq 80$ ; satisfactory if 70%-79.9% of students score  $\geq 80$ ; less satisfactory if  $< 70\%$  of students score  $\geq 80$ .

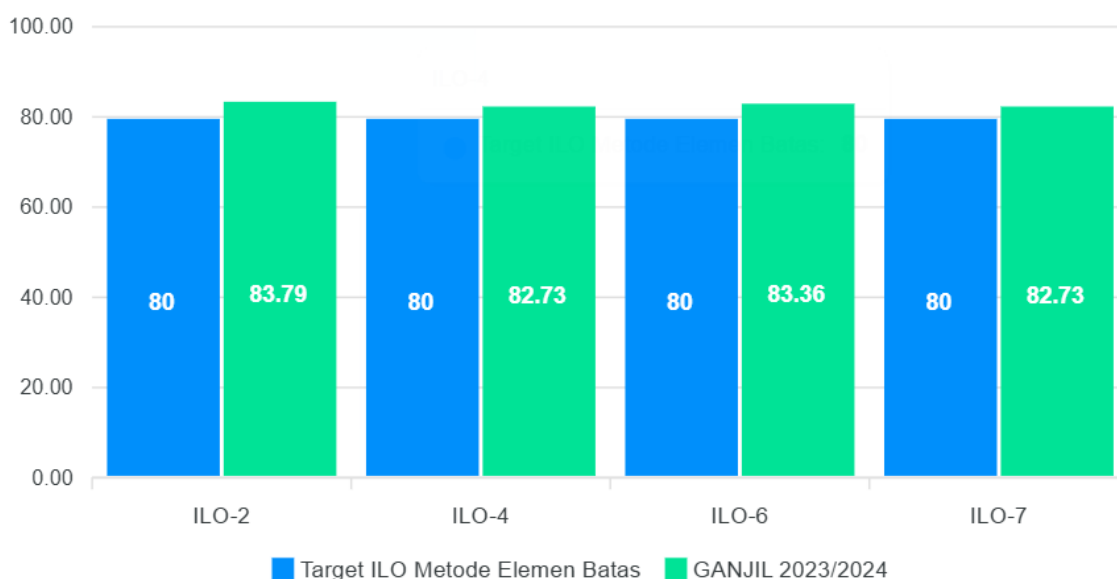
### Course Grade

| Course Grade | Number and Percentage of Students |
|--------------|-----------------------------------|
| A            | 1 (16.7%)                         |
| A-           | 5 (83.3%)                         |
| B+           | 0 (0.0%)                          |
| B            | 0 (0.0%)                          |
| B-           | 0 (0.0%)                          |
| C+           | 0 (0.0%)                          |
| C            | 0 (0.0%)                          |
| D            | 0 (0.0%)                          |
| E            | 0 (0.0%)                          |

### 3. Learning evaluation (survey) results

(data source: items / narratives of the results of the MK evaluation questionnaire by students)

**Grafik ILO MK (Metode Elemen Batas)**



Hasil Pengukuran CPL Mata Kuliah Metode Elemen Batas

#### 4. Analysis and Reflection

##### Analysis and Reflection

Analysis shows that the realization of all indicators consistently exceeds the target 80. The highest achievement was at **ILO-2** at **83.79**, followed by **ILO-6** as large as **83.36**, and **ILO-4** and **ILO-7** as large as **82.73**. The overall achievement ranges above 82.7, which indicates that the Boundary Element Method MK learning and evaluation process is very effective. Success in exceeding targets in all indicators shows that students have mastered the expected competencies that exceed minimum standards. The consistency of these achievements reflects the high quality of teaching, relevant materials, and well-targeted evaluation instruments.

#### 5. Follow-up Plan

First, it is necessary to carry out in-depth documentation and analysis of best practices (*best practices*) which produces high performance, especially on **ILO-2** and **ILO-6** which has the highest value. The results of this analysis should become standard teaching guidelines. Second, to motivate continuous improvement (*continuous improvement*), **ILO targets** for the next period it can be considered to be **increased** gradually, for example to 81 or 82. This increase in target will challenge the teaching team to continue to innovate. Third, considering that this course has a technical and computational nature, it is necessary to maintain and if possible **expand the integration between theory and software applications** or *hands-on* practicum to strengthen the in-depth understanding that students have achieved.

#### 6. Follow-up results on the previous semester's evaluation

The realization of consistently exceeding the target of 80 on all indicators can be interpreted as **confirmation of the success of the improvement and follow-up efforts that have been implemented in the previous evaluation period**. This superior achievement shows that if in the previous semester there were unsatisfactory indicators, the interventions implemented (for example improving teaching methods or aligning the curriculum) have proven to be very effective. The results for Odd 2023/2024 are clear evidence of the success of the self-evaluation process and the teaching team's commitment to achieving quality that exceeds standards.

Makassar, 24 Oktober 2025

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