**EGCO 495 Capstones project:**

Academic year 2018-19 (Semester 2)

All SOs are measured

1. an ability to identify, formulate, and solve complex engineering

problems by applying principles of engineering, science, and

mathematics

**Passing criterion >= 70%**

* 1. identify and formulate engineering problems

1-2 solve problems by applying mathematics and engineering

knowledge

| **Student No.** | **PI 1-1 Progress**  **(>=1.5)** | **PI 1-2 Final**  **(>=1.5)** |
| --- | --- | --- |
| 1(group 1) | ✓ | ✓ |
| 2(group 1) | ✓ | ✓ |
| 3(group 2) | ✓ | ✓ |
| 4(group 2) | ✓ | ✓ |
| 5(group 2) | ✓ | ✓ |
| 6(group 3) | ✓ | ✓ |
| 7(group 4) | ✓ | ✓ |
| 8(group 4) | ✓ | ✓ |
| 9(group 5) | ✓ | ✓ |
| 10(group 5) | ✓ | ✓ |
| 11(group 5) | ✓ | ✓ |
| 12(group 6) | 🗶 | ✓ |
| 13(group 6) | 🗶 | ✓ |
| 14(group 7) | ✓ | ✓ |
| 15(group 7) | ✓ | ✓ |
| 16(group 7) | ✓ | ✓ |
| 17(group 8) | 🗶 | ✓ |
| 18(group 8) | 🗶 | ✓ |
| 19(group 9) | ✓ | ✓ |
| 20(group 10) | ✓ | ✓ |
| 21(group 10) | ✓ | ✓ |
| 22(group 10) | ✓ | ✓ |
| 23(group 11) | ✓ | ✓ |
| 24(group11) | ✓ | ✓ |
| 25(group 11) | ✓ | ✓ |
| 26 (group 12) | ✓ | ✓ |
| 27(group 12) | ✓ | ✓ |
| 28(group 13) | ✓ | ✓ |
| 29(group 13) | ✓ | ✓ |
| 30(group 14) | ✓ | ✓ |
| 31(group 14) | ✓ | ✓ |
| 32(group 14) | ✓ | ✓ |
| 33(group 15) | 🗶 | ✓ |
| 34(group 16) | ✓ | ✓ |
| Number of Pass | 29 | 34 |

PI 1-1: Attainability = 29/34 = 85.3% **Attainable**

PI 1-2: Attainability = 34/34 =100% **Attainable**

**SO1 Conclusion**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **PI** | **Attainability** | **Reason** | **Remedial Action** | **Action plan** | **Measurements** |
| 1-1 | ✓ | Performance is not fully monitored and measured properly. It is only measured during presentation. | Create detailed measurement techniques | Next academic year | Next academic year |
| 1-2 | ✓ |  |  |  |  |

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2. an ability to apply engineering design to produce solutions that

meet specified needs with consideration of public health, safety, and

welfare, as well as global, cultural, social, environmental, and

economic factor

**Passing criterion >= 70%**

2-1 produce a design that meet a set of requirements, needs, and

constraints

| **Student No.** | **PI 2-1 Progress**  **(>=2.5)** | **PI 2-1 Final**  **(>=3.5)** |
| --- | --- | --- |
| 1(group 1) | ✓ | ✓ |
| 2(group 1) | ✓ | ✓ |
| 3(group 2) | ✓ | ✓ |
| 4(group 2) | ✓ | ✓ |
| 5(group 2) | ✓ | ✓ |
| 6(group 3) | ✓ | ✓ |
| 7(group 4) | ✓ | ✓ |
| 8(group 4) | ✓ | ✓ |
| 9(group 5) | 🗶 | ✓ |
| 10(group 5) | 🗶 | ✓ |
| 11(group 5) | 🗶 | ✓ |
| 12(group 6) | ✓ | ✓ |
| 13(group 6) | ✓ | ✓ |
| 14(group 7) | ✓ | ✓ |
| 15(group 7) | ✓ | ✓ |
| 16(group 7) | ✓ | ✓ |
| 17(group 8) | 🗶 | 🗶 |
| 18(group 8) | 🗶 | 🗶 |
| 19(group 9) | ✓ | ✓ |
| 20(group 10) | ✓ | ✓ |
| 21(group 10) | ✓ | ✓ |
| 22(group 10) | ✓ | ✓ |
| 23(group 11) | ✓ | ✓ |
| 24(group11) | ✓ | ✓ |
| 25(group 11) | ✓ | ✓ |
| 26 (group 12) | ✓ | ✓ |
| 27(group 12) | ✓ | ✓ |
| 28(group 13) | ✓ | ✓ |
| 29(group 13) | ✓ | ✓ |
| 30(group 14) | ✓ | ✓ |
| 31(group 14) | ✓ | ✓ |
| 32(group 14) | ✓ | ✓ |
| 33(group 15) | ✓ | 🗶 |
| 34(group 16) | ✓ | ✓ |
| Number of Pass | 29 | 31 |

PI 2-1: Attainability = (29/34 + 31/34)/2 = 88.2% **Attainable**

**SO2 Conclusion**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **PI** | **Attainability** | **Reason** | **Remedial Action** | **Action plan** | **Measurements** |
| 2-1 | ✓ | Some projects do not create good enough designed expected. | Build more background in project seminar courses to have compulsory design background | Next academic year | Next academic year |

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3. an ability to communicate effectively with a range of audiences

**Passing criterion >= 70%**

3-1 demonstrate clearly, precise, and concise presentation using

appropriate terminology

3-2 show confidence and use appropriate tone and gesture to make

audience concentration in presentation

| **Student No.** | **PI 3-1 / PI 3-2**  **Progress Presentation**  **(>=2.3)** | **PI 3-1 / PI 3-2**  **Final Presentation**  **(>=2.3)** | **PI 3-1**  **Poster Presentation**  **(>=15)** | **PI 3-2**  **Poster Presentation**  **(>=7.5)** |
| --- | --- | --- | --- | --- |
| 1(group 1) | ✓ | ✓ | ✓ | ✓ |
| 2(group 1) | ✓ | ✓ | ✓ | ✓ |
| 3(group 2) | ✓ | ✓ | ✓ | ✓ |
| 4(group 2) | ✓ | ✓ | ✓ | ✓ |
| 5(group 2) | ✓ | ✓ | ✓ | ✓ |
| 6(group 3) | 🗶 | ✓ | ✓ | ✓ |
| 7(group 4) | ✓ | ✓ | ✓ | ✓ |
| 8(group 4) | ✓ | ✓ | ✓ | ✓ |
| 9(group 5) | ✓ | ✓ | ✓ | ✓ |
| 10(group 5) | ✓ | ✓ | ✓ | ✓ |
| 11(group 5) | ✓ | ✓ | ✓ | ✓ |
| 12(group 6) | 🗶 | 🗶 | ✓ | ✓ |
| 13(group 6) | 🗶 | 🗶 | ✓ | ✓ |
| 14(group 7) | 🗶 | ✓ | ✓ | ✓ |
| 15(group 7) | 🗶 | ✓ | ✓ | ✓ |
| 16(group 7) | 🗶 | ✓ | ✓ | ✓ |
| 17(group 8) | 🗶 | 🗶 | ✓ | ✓ |
| 18(group 8) | 🗶 | 🗶 | ✓ | ✓ |
| 19(group 9) | 🗶 | ✓ | ✓ | ✓ |
| 20(group 10) | 🗶 | ✓ | ✓ | ✓ |
| 21(group 10) | 🗶 | ✓ | ✓ | ✓ |
| 22(group 10) | 🗶 | ✓ | ✓ | ✓ |
| 23(group 11) | ✓ | ✓ | ✓ | ✓ |
| 24(group11) | ✓ | ✓ | ✓ | ✓ |
| 25(group 11) | ✓ | ✓ | ✓ | ✓ |
| 26 (group 12) | ✓ | ✓ | ✓ | ✓ |
| 27(group 12) | ✓ | ✓ | ✓ | ✓ |
| 28(group 13) | ✓ | ✓ | ✓ | ✓ |
| 29(group 13) | ✓ | ✓ | ✓ | ✓ |
| 30(group 14) | 🗶 | 🗶 | ✓ | ✓ |
| 31(group 14) | 🗶 | 🗶 | ✓ | ✓ |
| 32(group 14) | 🗶 | 🗶 | ✓ | ✓ |
| 33(group 15) | 🗶 | 🗶 | 🗶 | ✓ |
| 34(group 16) | ✓ | ✓ | ✓ | ✓ |
| Number of Pass | 18 | 26 | 33 | 34 |

PI 3-1 Progress presentation (weight 0.2) : Attainability = 18/34 = 52.9%

PI 3-1 Final presentation (weight 0.4): Attainability = 26/34 = 76.5%

PI 3-1 Poster presentation (weight 0.4): Attainability = 33/34 = 97.1%

PI 3-1 Average: Attainability = (52.9\*0.2+76.5\*0.4+97.1\*0.4) = 80.02% **Attainable**

PI 3-1 Progress presentation (weight 0.2) : Attainability = 18/34 = 52.9%

PI 3-1 Final presentation (weight 0.4): Attainability = 26/34 = 76.5%

PI 3-1 Poster presentation (weight 0.4): Attainability = 34/34 = 100%

PI 3-1 Average: Attainability = (52.9\*0.2+76.5\*0.4+100\*0.4) = 81.18% **Attainable**

**SO3 Conclusion**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **PI** | **Attainability** | **Reason** | **Remedial Action** | **Action plan** | **Measurements** |
| 3-1 | ✓ | The measurement is not yet developed according to PI. | Create clear measurement with rubric for each PI. | Next academic year | Next academic year |
| 3-2 | ✓ |

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4. an ability to recognize ethical and professional responsibilities in

engineering situations and make informed judgments, which must

consider the impact of engineering solutions in global, economic,

environmental, and societal contexts

**Passing criterion >= 70%**

4-1 know code of ethics for the discipline

4-2 follow class agreements, laws, and regulations

| **Student No.** | **PI 4-1 Progress**  **(>=1)** | **PI 4-1 Progress**  **(>=2.5)** | **PI 4-2**  **Follow class agreement/punctuality** |
| --- | --- | --- | --- |
| 1(group 1) | ✓ | ✓ | ✓ |
| 2(group 1) | ✓ | ✓ | ✓ |
| 3(group 2) | ✓ | ✓ | ✓ |
| 4(group 2) | ✓ | ✓ | ✓ |
| 5(group 2) | ✓ | ✓ | ✓ |
| 6(group 3) | ✓ | ✓ | ✓ |
| 7(group 4) | ✓ | ✓ | ✓ |
| 8(group 4) | ✓ | ✓ | ✓ |
| 9(group 5) | ✓ | ✓ | ✓ |
| 10(group 5) | ✓ | ✓ | ✓ |
| 11(group 5) | ✓ | ✓ | ✓ |
| 12(group 6) | ✓ | ✓ | 🗶 |
| 13(group 6) | ✓ | ✓ | 🗶 |
| 14(group 7) | ✓ | ✓ | ✓ |
| 15(group 7) | ✓ | ✓ | ✓ |
| 16(group 7) | ✓ | ✓ | ✓ |
| 17(group 8) | ✓ | 🗶 | 🗶 |
| 18(group 8) | ✓ | 🗶 | 🗶 |
| 19(group 9) | ✓ | ✓ | 🗶 |
| 20(group 10) | ✓ | ✓ | 🗶 |
| 21(group 10) | ✓ | ✓ | 🗶 |
| 22(group 10) | ✓ | ✓ | 🗶 |
| 23(group 11) | ✓ | ✓ | ✓ |
| 24(group11) | ✓ | ✓ | ✓ |
| 25(group 11) | ✓ | ✓ | ✓ |
| 26 (group 12) | ✓ | ✓ | ✓ |
| 27(group 12) | ✓ | ✓ | ✓ |
| 28(group 13) | ✓ | ✓ | ✓ |
| 29(group 13) | ✓ | ✓ | ✓ |
| 30(group 14) | ✓ | ✓ | ✓ |
| 31(group 14) | ✓ | ✓ | ✓ |
| 32(group 14) | ✓ | ✓ | ✓ |
| 33(group 15) | ✓ | ✓ | ✓ |
| 34(group 16) | ✓ | ✓ | ✓ |
| Number of Pass | 34 | 32 | 26 |

PI 4-1: Attainability =( 34/34+32/34)/2 = 97.1% **Attainable**

PI 4-2: Attainability = 26/34 = 76.5% **Attainable**

**SO4 Conclusion**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **PI** | **Attainability** | **Reason** | **Remedial Action** | **Action plan** | **Measurements** |
| 4-1 | ✓ | The measurement is not yet developed according to PI. | Create clear measurement with rubric for the PI. | Next academic year | Next academic year |
| 4-2 | ✓ |  |  |  |  |

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5. an ability to function effectively on a team whose members

together provide leadership, create a collaborative and inclusive

environment, establish goals, plan tasks, and meet objectives

**Passing criterion >= 70%**

5-1 assign the appropriate tasks and establish plans to finish work

and meet goals on time

5-2 create fair collaboration

Advisor observation & Advisory notes

| **Student No.** | **PI 5-1** | **PI 5-2** |
| --- | --- | --- |
| 1(group 1) | ✓ | ✓ |
| 2(group 1) | ✓ | ✓ |
| 3(group 2) | ✓ | ✓ |
| 4(group 2) | ✓ | ✓ |
| 5(group 2) | ✓ | ✓ |
| 6(group 3) | 🗶 | 🗶 |
| 7(group 4) | ✓ | ✓ |
| 8(group 4) | ✓ | ✓ |
| 9(group 5) | ✓ | ✓ |
| 10(group 5) | ✓ | ✓ |
| 11(group 5) | ✓ | ✓ |
| 12(group 6) | ✓ | ✓ |
| 13(group 6) | ✓ | ✓ |
| 14(group 7) | ✓ | ✓ |
| 15(group 7) | ✓ | ✓ |
| 16(group 7) | ✓ | ✓ |
| 17(group 8) | 🗶 | 🗶 |
| 18(group 8) | 🗶 | 🗶 |
| 19(group 9) | 🗶 | ✓ |
| 20(group 10) | ✓ | ✓ |
| 21(group 10) | ✓ | ✓ |
| 22(group 10) | ✓ | ✓ |
| 23(group 11) | ✓ | ✓ |
| 24(group11) | ✓ | ✓ |
| 25(group 11) | ✓ | ✓ |
| 26 (group 12) | ✓ | ✓ |
| 27(group 12) | ✓ | ✓ |
| 28(group 13) | ✓ | ✓ |
| 29(group 13) | ✓ | ✓ |
| 30(group 14) | ✓ | ✓ |
| 31(group 14) | ✓ | ✓ |
| 32(group 14) | ✓ | ✓ |
| 33(group 15) | 🗶 | 🗶 |
| 34(group 16) | 🗶 | 🗶 |
| Number of Pass | 28 | 28 |

PI 5-1: Attainability = 28/34 = 82.35% **Attainable**

PI 5-2: Attainability 28/34 = 82.35% **Attainable**

**SO5 Conclusion**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **PI** | **Attainability** | **Reason** | **Remedial Action** | **Action plan** | **Measurements** |
| 5-1 | ✓ | Some projects are individual projects | More strict on forming an individual project. | Next academic year | Next academic year |
| The measurement is not yet developed according to PI.  Only notes with advisors signatures and complaints are observed and recorded. | Create clear measurement with rubric for the PI |
| 5-2 | ✓ |

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6. an ability to develop and conduct appropriate experimentation

6-1 develop and conduct appropriate experimentation

6-2 analyze and interpret data, and use engineering judgment to

draw conclusions

**Passing criterion >= 70%**

| **Student No.** | **PI 6-1 Progress**  **(>=2.3)** | **PI 6-2 Final**  **(>=3.5)** | **PI 6-2 Black book** |
| --- | --- | --- | --- |
| 1(group 1) | 🗶 | ✓ | ✓ |
| 2(group 1) | 🗶 | ✓ | ✓ |
| 3(group 2) | ✓ | ✓ | ✓ |
| 4(group 2) | ✓ | ✓ | ✓ |
| 5(group 2) | ✓ | ✓ | ✓ |
| 6(group 3) | 🗶 | 🗶 | ✓ |
| 7(group 4) | ✓ | 🗶 | ✓ |
| 8(group 4) | ✓ | 🗶 | ✓ |
| 9(group 5) | 🗶 | 🗶 | ✓ |
| 10(group 5) | 🗶 | 🗶 | ✓ |
| 11(group 5) | 🗶 | 🗶 | ✓ |
| 12(group 6) | ✓ | 🗶 | ✓ |
| 13(group 6) | ✓ | 🗶 | ✓ |
| 14(group 7) | 🗶 | ✓ | ✓ |
| 15(group 7) | 🗶 | ✓ | ✓ |
| 16(group 7) | 🗶 | ✓ | ✓ |
| 17(group 8) | 🗶 | 🗶 | ✓ |
| 18(group 8) | 🗶 | 🗶 | ✓ |
| 19(group 9) | 🗶 | ✓ | ✓ |
| 20(group 10) | ✓ | ✓ | ✓ |
| 21(group 10) | ✓ | ✓ | ✓ |
| 22(group 10) | ✓ | ✓ | ✓ |
| 23(group 11) | ✓ | ✓ | ✓ |
| 24(group11) | ✓ | ✓ | ✓ |
| 25(group 11) | ✓ | ✓ | ✓ |
| 26 (group 12) | ✓ | ✓ | ✓ |
| 27(group 12) | ✓ | ✓ | ✓ |
| 28(group 13) | 🗶 | ✓ | ✓ |
| 29(group 13) | 🗶 | ✓ | ✓ |
| 30(group 14) | 🗶 | ✓ | ✓ |
| 31(group 14) | 🗶 | ✓ | ✓ |
| 32(group 14) | 🗶 | ✓ | ✓ |
| 33(group 15) | 🗶 | 🗶 | ✓ |
| 34(group 16) | ✓ | ✓ | ✓ |
| Number of Pass | 17 | 25 | 34 |

PI 6-1: Attainability 17/34 = 50%  **Not Attainable**

PI 6-2: Attainability = (25/34+34/34)/2 = 86.8% **Attainable**

**SO6 Conclusion**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **PI** | **Attainability** | **Reason** | **Remedial Action** | **Action plan** | **Measurements** |
| 6-1 | 🗶 | Many projects do not show enough experimentation and do not properly form good enough experimentation to form a proper results. | Build more backgrounds and measured more extensively during project seminar courses. | Next academic year | Next academic year |
| 6-2 | ✓ |  |  |  |  |

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7. an ability to acquire and apply new knowledge as needed, using

appropriate learning strategies

**Passing criterion >= 70%**

7-1 acquire and apply new knowledge

7-2 use appropriate sources of knowledge

| **Student No.** | **PI 7-1 Progress**  **(>=2)** | **PI 7-1 and 7-2 Final**  **Presentation**  **(>=2)** | **PI 7-2 Black book** |
| --- | --- | --- | --- |
| 1(group 1) | ✓ | ✓ | ✓ |
| 2(group 1) | ✓ | ✓ | ✓ |
| 3(group 2) | ✓ | ✓ | ✓ |
| 4(group 2) | ✓ | ✓ | ✓ |
| 5(group 2) | ✓ | ✓ | ✓ |
| 6(group 3) | ✓ | ✓ | ✓ |
| 7(group 4) | ✓ | ✓ | ✓ |
| 8(group 4) | ✓ | 🗶 | ✓ |
| 9(group 5) | ✓ | 🗶 | ✓ |
| 10(group 5) | ✓ | 🗶 | ✓ |
| 11(group 5) | ✓ | 🗶 | ✓ |
| 12(group 6) | ✓ | 🗶 | ✓ |
| 13(group 6) | ✓ | 🗶 | ✓ |
| 14(group 7) | ✓ | ✓ | ✓ |
| 15(group 7) | ✓ | ✓ | ✓ |
| 16(group 7) | ✓ | ✓ | ✓ |
| 17(group 8) | ✓ | 🗶 | ✓ |
| 18(group 8) | ✓ | 🗶 | ✓ |
| 19(group 9) | ✓ | ✓ | ✓ |
| 20(group 10) | ✓ | ✓ | ✓ |
| 21(group 10) | ✓ | ✓ | ✓ |
| 22(group 10) | ✓ | ✓ | ✓ |
| 23(group 11) | ✓ | ✓ | ✓ |
| 24(group11) | ✓ | ✓ | ✓ |
| 25(group 11) | ✓ | ✓ | ✓ |
| 26 (group 12) | ✓ | ✓ | ✓ |
| 27(group 12) | ✓ | ✓ | ✓ |
| 28(group 13) | ✓ | ✓ | ✓ |
| 29(group 13) | ✓ | ✓ | ✓ |
| 30(group 14) | ✓ | 🗶 | ✓ |
| 31(group 14) | ✓ | 🗶 | ✓ |
| 32(group 14) | ✓ | 🗶 | ✓ |
| 33(group 15) | ✓ | 🗶 | ✓ |
| 34(group 16) | ✓ | ✓ | ✓ |
| Number of Pass | 17 | 25 | 34 |

PI 7-1: Attainability = (17/34+25/34)/2= 66.17% **Attainable**

PI 7-2: Attainability = (25/34+34/34)/2 = 86.56% **Attainable**

**SO7 Conclusion**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **PI** | **Attainability** | **Reason** | **Remedial Action** | **Action plan** | **Measurements** |
| 7-1 | 🗶 | Many projects do not show enough knowledge acquisition skills. | Build more backgrounds and measured more extensively during project seminar courses. | Next academic year | Next academic year |
| 7-2 | ✓ |  |  |  |  |