# Integrating Intended Learning Outcomes (ILO's) with Programme Outcomes for a Year 2 Continually Assessed Compulsory Subject using Criteria Referenced Assessment (CRA)

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# Subject: Industrial Engineering Techniques and Methods (ISE318)

**Co-requisite**: None **Pre-requisite**: None

**Level of Study**: 3

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**Hours Assigned:**

| | | | |
|---|---|---|---|
| Lecture/Tutorial | 2 hours/week for 12 weeks | = | 24 hours |
| Laboratory/Case Study | 3 hours/week for 6 weeks | = | 18 hours |
| | | = | 42 hours |

**Group Size:** 40 (Laboratories/Case Studies)

**Method of Assessment**: Continuous Assessment - 100%. Comprised of assignments with individual and group components, usually TWO progress tests, one mid-semester and one at the end of the semester. All assessment components will require students to apply what they have learnt to realistic work applications.

**Number of Credits**: 3

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# Syllabus

1. Introduction.
   Productivity, causes of low productivity in organisations, resources and outputs of, their importance, and how they are measured.

2. Work Improvement
   Benefits, the systematic approach, identifying improvement areas in enterprises. Terms of reference. approach to personnel, techniques of recording information. Systems flowcharting. Design of documents in both hard and electronic format. Principles of computer screen layout. Examination of existing working methods and development of new methods and procedures. Implementation and continuous improvement.

3. Work Measurement
   Purposes in manufacturing and the service sector. Techniques for industrial and clerical work, work logging, time study. Work sampling with observations at random and fixed time intervals. Introduction to predetermined motion time systems for manufacturing and clerical work.

4. Layout Planning
   Objectives, types of layout found in industry and the clerical sector. Systematic layout planning as applied to manufacturing and clerical work. Introduction to design of flowlines in manufacturing

# Learning Outcomes

*Category A relates to: Professional/Academic knowledge and skills, and Category B: Attributes for all-roundedness.*

1. To examine an existing work situation and to conduct a work improvement programme in both a manufacturing, or service company in order to identify low productivity (*Objective 1 and Syllabus Item 1)*. *Category A*

2. To apply appropriate recording techniques to improve existing, or design new, work methods and procedures, (*Objective 1 and Syllabus Item 2)*. *Category A*

3. To select an appropriate measurement technique (time study and PMTS) and apply it to measure the standard time for the work involved (*Objective 2 and Syllabus Item 3)*. *Category A*

4. To be able to design a work sampling study, apply it to variable work situation, analyse the results, and estimate the standard time for the work involved (*Objective 3 and Syllabus Item 3)*. *Category A*

5. To recognise the objectives of layout planning in both manufacturing, and service companies and evaluate its effectiveness, *Objective 4 and Syllabus Item 4)*. *Category A*

*6.* To apply suitable layout planning techniques, and to recognise their limitations when considering space requirements, availability and building configurations, *Objective 4 and Syllabus Item 4)*. *Category A*

# Teaching Scheme - Lectures

| Week | Date | Lecture |
|---|---|---|
| 2 | 7 Sep | Introduction to subject content. Productivity, causes of low productivity in enterprises, resources and outputs of enterprises, their importance and measurement |
| 3 | 14 Sep | Work Improvement, benefits, the systematic approach, identifying improvement areas in enterprises. Terms of Reference. Approach to personnel. Techniques of recording information |
| 4 | 21 Sep | Systems flowcharting. Design of documents in both hard and electronic format. Principles of computer screen layout |
| 5 | 28 Sep | Examination of existing working methods and development of new methods and procedures. Implementation and continuous improvement |
| 6 | 5 Oct | Work Measurement: purposes in manufacturing and the service sector. Techniques for industrial and clerical work, self recording, time study |
| 7 | 12 Oct | Test 1 |
| 8 | 19 Oct | Work sampling with observations at random time intervals |
| 9 | 26 Oct | Work sampling with observations at fixed time intervals |
| 10 | 2 Nov | Introduction to predetermined motion time systems for manufacturing and clerical work. |
| 11 | 9 Nov | Layout Planning: objectives, types of layout found in industry and the clerical sector. Systematic layout planning as applied to manufacturing and clerical work |
| 12 | 16 Nov | Introduction to design of flowlines in manufacturing |
| 13 | 23 Nov | Test 2 |

# Teaching Scheme - Laboratory and Case Studies (One Group only)

| Week | Date | Group | Laboratory / Case Studies |
|---|---|---|---|
| 4 | 18th September | BEng(Hons)2 ISE | Case Study 1 |
| 6 | 4th October * | BEng(Hons)2 ISE | Case Study 2 |
| 8 | 16th October | BEng(Hons)2 ISE | Case Study 3 |
| 10 | 1st November* | BEng(Hons)2 ISE | Case Study 4 |
| 12 | 13th November | BEng(Hons)2 ISE | Laboratory |
| 14 | 27th November | BEng(Hons)2 ISE | Review of Case Studies |

***** Classes re-arranged because of public holidays on 2nd and 30th October. Room CF403, Time 1.30 to 4.30pm

## Typical Class Size (eight classes)

- BEng(Hons) in ISE and Major in ISE 38 students
- BSc(Hons) in EEEB 31 students
- BSc(Hons) in LEM Year 2 54 students Total 244
- Double Degree 21 students students
- HD in ISE (both Year 1 and Year 2) 97 students
- Exchange students 3 students

# PolyU Grading System and Conversion Scale from Grade to Grade Point Average (GPA)

| Grade | Grade Point | Grade Point Range |
|---|---|---|
| A+ | 4.5 | 4.15 – 4.50 |
| A | 4.0 | 3.75 – 4.14 |
| B+ | 3.5 | 3.25 – 3.74 |
| B | 3.0 | 2.75 – 3.24 |
| C+ | 2.5 | 2.25 – 2.74 |
| C | 2.0 | 1.75 – 2.24 |
| D+ | 1.5 | 1.25 - 1.74 |
| D | 1.0 | 0.60 – 1.24 |
| F | 0 | 0.00 – 0.59 |

# Assessment Components

| Activities | Assessment | Percentage | |
|---|---|---|---|
| **Assignment** - Productivity | Individual | 2% | 2% |
| **Case Study 1 –** Packing Parcels in the Packing Department of a Retail Department Store | Group | 7% | 7% |
| | Individual - 1 | 2.33% | 7% |
| | Individual - 2 | 2.33% | |
| | Individual - 3 | 2.33% | |
| **Case Study 2** - Insurance Claims Processing | Group – 1 | 3% | 6% |
| | Group - 2 | 3% | |
| | Individual | 5% | 5% |
| **Test 1** | Individual | 15% | 15% |
| **Case Study 3 –** Forms Design and Screen Layout | Individual - 1 | 7% | 14% |
| | Individual -1 | 7% | |
| **Case Study 4 –** Analysing the Workload in a Sales Office | Group | 15% | 15% |
| **Laboratory Work** - Layout Planning | Individual | 14% | 14% |
| **Test 2** | Individual | 15% | 15% |

| | |
|---|---|
| Individual Components | 72% |
| Group Components | 28% |
| Total | 100% |

# Criteria Referenced Assessment Scheme Details

## Assignment – Productivity

One piece of Individual work (2% of subject the total).

**Description**

This question requires students to examine what has been covered during the first lecture, list and briefly describe FIVE suitable objectives that they think would be appropriate for improving productivity in a typical commercial organisation such as a bank, insurance company, logistics company, government department, etc.

Students are required to hand their work in the following week.

**Grading Criteria** - PolyU Grading System

- Specification of Five suitable and concisely presented objectives
- Their relevance to the organization for productivity improvement

| | |
|---|---|
| Grade A+ | Five out of Five (Excellent / Outstanding - Exceeds requirements in all / nearly all regards) |
| Grade A | |
| Grade B+ | Four out of Five (Good/Very Good - Exceeds requirements in some / majority of regards) |
| Grade B | |
| Grade C+ | Three out of Five (Satisfactory/Wholly Satisfactory – Largely / Fully meets all requirements) |
| Grade C | |
| Grade D+ | Two out of Five (Marginal - Fails to some / all requirements) |
| Grade D | |
| Grade F | One or None out of Five (Inadequate - Fails to most requirements) |

# Case Study 1
# Packing Parcels in the Packing Department of a Retail Department Store

Three pieces of Individual work (2.33% for each one = 7% of the subject total) and one piece of Group work (7% of the total).

## Description

This case study examines the packing procedure and staffing level of a packing department of a retail department store whereby goods arrive intermittently from the consumer and have to be packed the day they arrive to maintain the Store's guarantee.

- In order to understand the current procedure, students are required to draw three different types of flowcharts (Task 1 - a Procedural Flowchart, Task 2 - an OTIS chart and Task 3 - a Flow Diagram)
- To recommend an improved procedure (Task 4)
- To examine existing staffing levels (Task's 5 and 6)
- To recommend improved levels (Task 7)
- To think "out of the box" (Task 8).

## Grading Criteria - PolyU Grading System

Tasks 1, 2, 3 (Individual work)

For each of the three charts students are assessed on the basis of:

- Item 1 - The structure and presentation of the chart drawn
- Item 2 - The accuracy in portraying the actual situation
- Item 3 - Its ability to be critically analysed

Task 4 (Group work)

The practicality and creativity of ideas suggested coupled with the way in which they are presented.

Task's 5 and 6 (Group work)

- The recognition as to whether the existing staffing level can ensure the guarantee can be kept or otherwise.

Task 7 (Group work)

- The accuracy and practicality of the recommendation.
- Its presentation

Task 8 (Group work)

- The number, practicality of other options considered
- Creative ideas, i.e. the extent to which a student group can "think out of the box"

# Case Study 2 - Insurance Claims Processing

Two pieces of Group work (3% for each one = 6% of the subject total) and one piece of Individual work. (5% of the subject total)

## Description

This case study examines the processing procedure for a company dealing with fire and accident claims that are received either direct from clients or from brokers. Students are required to examine the existing procedure and to computerise it. In so doing there are three tasks, they have to put themselves in the place of a systems analyst who is Project Leader and have to

- Explain how they would approach the project (Task 1)
- Draw a flowchart of their choice of the revised system (Task 2)
- Estimate the duration of the project (Task 3).

## Grading Criteria - PolyU Grading System

Task 1 (Group Work)

- Approach towards staff and using the chain of command
- Soliciting cooperation and ideas from staff
- Sensitivity when interviewing staff regarding redundancy issues
- Dealing with resistance to change

Task 2 (Individual Work)

- The structure and presentation of the chart drawn
- The accuracy in portraying the actual situation
- Its ability to be critically analysed
- Ammendments to the existing procedure

Task 3 (Group Work)

- Accuracy of the project duration
- Important issues connected with the project duration
- Presentation of the results

# Test 1

Individual Work, Open Book, students required to answer THREE questions (5% for each question = 15% of the subject total).

Question 1 To design a one day training course to introduce industrial engineering in a local fast food organisation.

Question 2 Essentially a calculation of determining the time and number of operators required to pack components in a dispatch department.

Question 3 To draw a flowchart explaining how the student spends a typical day at the University.

# Grading Criteria - PolyU Grading System

Question 1

- The topics and mode of delivery covered with reasons relative to the type of industry
- The depth of treatment relative to the participants and the time available
- The overall structure and sequence of topics delivered
- Presentation

Question 2

- The approach and accuracy of the answers recognising simple arithmetic errors as compared to logic errors
- Presentation

Question 3

- The overall structure and presentation of the chart drawn
- The use of the ISO symbols for flowcharting
- The use of connectors to break the flowchart in logical blocks
- The level of detail

# Case Study 3 – Forms Design and Screen Layout

Two pieces of Individual work (7% for each one = 14% of the subject total).

This case study requires students to

- Design a hard copy of a planning document (Task 1) on A5 size paper that has to be passed through the various departments of a manufacturing company
- To computerise the documentation system by design a VDU (computer screen) layout for staff to input the information electronically and send it through the company's intranet (Task 2).

## Grading Criteria

These are based on the principles of good form and VDU layout design

Task 1

- Overall layout, use of space, clarity of instructions, suitable margins, adequate spacing, sequence of information entry
- Presentation

Task 2

- Overall layout, use of space, clarity of instructions, suitable margins, adequate spacing, sequence of information entry, degree of user friendlyness
- Presentation

# Case Study 4 – Analysing the Workload in a Sales Office

One piece of group work composed of two parts (a holistic grade given for the work = 15% of the subject total).

This case study has two parts:

- Part 1 requires students to analyse data that has been obtained by work logging in a sales office that processes various types of orders for both home and export orders in order to determine appropriate time standards
- Part 2 requires them to use the information that they have determined in Part 1 to determine staffing levels for various combinations of work

## Grading Criteria - PolyU Grading System

Part 1 (Group work)

- The manner in which the data is analyses and the accuracy of the standards derived.
- The recommended application method and the recognition of its limitations.
- The presentation of the results and the extent to which they can be understood.

Part 2 (Group work)

- The presentation and practicality of the results on an Excel spreadsheet
- The extent to which the results can be used and their limitations.

# Laboratory - Layout Planning

One piece of Individual work (14% of the subject total).

This exercise requires students to locate office managers and staff in an office complex. Students are given a scale floor plan and space requirements of personnel (managers and staff) together with their activity relationships. They are required to lay the office complex out, including specifying any corridors and where doorways of all staff should be located.

Grading Criteria - PolyU Grading System (see summary sheet)

- The extent to which activity relationships are met
- Utilisation and practicality of space provided compared with that specified
- Overall presentation, preferably the final arrangement (this should be on Microsoft Visio or similar)
- The recommended application method and the recognition of its limitations
- The presentation of the results and the extent to which they can be understood

# Test 2

Individual, Open Book, students required to answer TWO questions (7.5% for each question = 15% of the subject total).

- Question 1 was to specify the MTM code and TMU value for 15 specified tasks.

- Question 2 was to comment of the results of a study on nursing duties in the public hospitals in Hong Kong and to draw conclusions from the data provided, and to discuss their limitations.

## Grading Criteria

Question 1 - The Number of “right” and “wrong” answers out of 15.

| | |
|---|---|
| Grade A+ | 14 or 15 |
| Grade A | 12 or 13 |
| Grade B+ | 11 |
| Grade B | 10 |

| | |
|---|---|
| Grade C+ | 9 |
| Grade C | 8 |
| Grade D+ | 7 |
| Grade D | 6 |

| | |
|---|---|
| Grade F | < 6 |

Question 2

- The approach and accuracy of the answers recognising simple arithmetic errors as compared to logic errors
- The substance of the answer, its limitations and how they could be rectified Presentation

# Criteria Referenced Assessment Scheme Summary

| | | PolyU Grading System / Criteria | F | D | D+ | C | C+ | B | B+ | A | A+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Fails to meet most requirements | Fails to meet some requirements | Marginally fails to meet all requirements | Largely meets all requirements | Fully meets all requirements | Exceeds requirements in some regards | Exceeds requirements in the majority of regards | Exceeds requirements in nearly all regards | Exceeds requirements in all regards |
| Assignment Productivity | Individual (2%) | • Specification of Five suitable and concisely presented objectives<br>• Their relevance to the organization for productivity improvement | One or None out of Five (Inadequate) | Two out of Five (Marginal) | | Three out of Five (Satisfactory/Wholly Satisfactory) | | Four out of Five | | (Good/Very Good) Five out of Five (Excellent/Outstanding) | |
| Case Study 1 – Packing Parcels in the Packing Department of a Retail Department Store | Individual – 1 (2.33%) | Task 1<br>• The structure and presentation of the chart drawn<br>• The accuracy in portraying the actual situation<br>• Its ability to be critically analysed | Inadequate | Marginal | Marginal | Satisfactory | Wholly Satisfactory | Good | Very Good | Excellent | Outstanding |
| | Individual – 2 (2.33%) | Task 2<br>(same as Task 1) | Inadequate | Marginal | Marginal | Satisfactory | Wholly Satisfactory | Good | Very Good | Excellent | Outstanding |
| | Individual – 3 (2.33%) | Task 3<br>(same as Task 1) | Inadequate | Marginal | Marginal | Satisfactory | Wholly Satisfactory | Good | Very Good | Excellent | Outstanding |
| | Group (7%) | Task 4<br>The practicality and creativity of ideas suggested coupled with the way in which they are presented.<br><br>Task's 5 and 6<br>The recognition as to whether the existing staffing level can ensure the guarantee can be kept or otherwise.<br><br>Task 7<br>• The accuracy and practicality of the recommendation.<br>• Its presentation<br><br>Task 8<br>• The number, practicality of other options considered<br>• Creative ideas, i.e. the extent to which a student group can "think out of the box" | Inadequate | Marginal | Marginal | Satisfactory | Wholly Satisfactory | Good | Very Good | Excellent | Outstanding |
| | | | F | D | D+ | C | C+ | B | B+ | A | A+ |

# Criteria-based Assessment Summary (continued)

| | | PolyU Grading System / Criteria | F | D | D+ | C | C+ | B | B+ | A | A+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Fails to meet most requirements | Fails to meet some requirements | Marginally fails to meet all requirements | Largely meets all requirements | Fully meets all requirements | Exceeds requirements in some regards | Exceeds requirements in the majority of regards | Exceeds requirements in nearly all regards | Exceeds requirements in all regards |
| Case Study 2 - Insurance Claims Processing | Group – 1 (3%) | Task 1<br>• Approach towards staff and using the chain of command<br>• Soliciting cooperation and ideas from staff<br>• Sensitivity when interviewing staff regarding redundancy issues<br>• Dealing with resistance to change | Inadequate | Marginal | Marginal | Satisfactory | Wholly Satisfactory | Good | Very Good | Excellent | Outstanding |
| | Individual (5%) | Task 2<br>• The structure and presentation of the chart drawn<br>• The accuracy in portraying the actual situation<br>• Its ability to be critically analysed<br>• Ammendmants to the existing procedure | Inadequate | Marginal | Marginal | Satisfactory | Wholly Satisfactory | Good | Very Good | Excellent | Outstanding |
| | Group – 2 (3%) | Task 3<br>• Accuracy of the project duration<br>• Important issues connected with project duration<br>• Presentation of the results | Inadequate | Marginal | Marginal | Satisfactory | Wholly Satisfactory | Good | Very Good | Excellent | Outstanding |
| Test 1 | Individual (15%) | Question 1 (5%)<br>• The topics and mode of delivery covered with reasons relative to the type of industry<br>• The depth of treatment relative to the participants and the time available<br>• The overall structure and sequence of topics delivered<br>• Presentation<br>Question 2 (5%)<br>• The approach and accuracy of the answers recognising simple arithmetic errors as compared to logic errors<br>• Presentation<br>Question 3 (5%)<br>• The overall structure and presentation of the chart drawn<br>• The use of the ISO symbols for flowcharting<br>• The use of connectors to break the flowchart in logical blocks<br>• The level of detail | Inadequate | Marginal | Marginal | Satisfactory | Wholly Satisfactory | Good | Very Good | Excellent | Outstanding |
| | | | F | D | D+ | C | C+ | B | B+ | A | A+ |

# Criteria-based Assessment Summary (continued)

| | | PolyU Grading System / Criteria | F | D | D+ | C | C+ | B | B+ | A | A+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Fails to meet most requirements | Fails to meet some requirements | Marginally fails to meet all requirements | Largely meets all requirements | Fully meets all requirements | Exceeds requirements in some regards | Exceeds requirements in the majority of regards | Exceeds requirements in nearly all regards | Exceeds requirements in all regards |
| Case Study 3 – Forms Design and Screen Layout | Individual – 1 (7%) | Task 1<br>• Overall layout, use of space, clarity of instructions, suitable margins, adequate spacing, sequence of information entry<br>• Presentation | Inadequate | Marginal | Marginal | Satisfactory | Wholly Satisfactory | Good | Very Good | Excellent | Outstanding |
| | Individual -3 (7%) | Task 2<br>• Overall layout, use of space, clarity of instructions, suitable margins, adequate spacing, sequence of information entry, degree of user friendlyness<br>• Presentation | Inadequate | Marginal | Marginal | Satisfactory | Wholly Satisfactory | Good | Very Good | Excellent | Outstanding |
| Case Study 4 – Analysing the Workload in a Sales Office | Group (15%) | Part 1<br>• The manner in which the data is analyses and the accuracy of the standards derived.<br>• The recommended application method and the recognition of its limitations.<br>• The presentation of the results and the extent to which they can be understood.<br>Part 2<br>• The presentation and practicality of the results on an Excel spreadsheet<br>• The extent to which the results can be used and their limitations. | Inadequate | Marginal | Marginal | Satisfactory | Wholly Satisfactory | Good | Very Good | Excellent | Outstanding |
| Laboratory - Layout Planning | Individual (14%) | • The extent to which activity relationships are met<br>• Utilisation and practicality of space provided compared with that specified<br>• Overall presentation, preferably the final arrangement (this should be on Microsoft Visio or similar)<br>• The recommended application method and the recognition of its limitations<br>• The presentation of the results and the extent to | Inadequate | Marginal | Marginal | Satisfactory | Wholly Satisfactory | Good | Very Good | Excellent | Outstanding |
| Test 2 | Individual (15%) | Question 1 - Number of "right" and "wrong" answers | < 6 out of 15 | 6 out of 15 | 7 out of 15 | 8 out of 15 | 9 out of 15 | 10 out of 15 | 11 out of 15 | 12 or 13 out of 15 | 14 or 15 out of 15 |
| | | Question 2<br>• The approach and accuracy of the answers recognising simple arithmetic errors as compared to logic errors<br>• The substance of the answer, its limiations and how they could be rectified<br>• Presentation | Inadequate | Marginal | Marginal | Satisfactory | Wholly Satisfactory | Good | Very Good | Excellent | Outstanding |
| File: D: AssessmentScheme2006-2007(Semester1).doc | | | F | D | D+ | C | C+ | B | B+ | A | A+ |

# **Subject Learning Outcomes** (r*epeated from Slide No 5)*

*Category A relates to: Professional/Academic knowledge and skills, and Category B: Attributes for all-roundedness.*

1. To examine an existing work situation and to conduct a work improvement programme in both a manufacturing, or service company in order to identify low productivity (*Objective 1 and Syllabus Item 1)*. *Category A*

2. To apply appropriate recording techniques to improve existing, or design new, work methods and procedures, (*Objective 1 and Syllabus Item 2)*. *Category A*

3. To select an appropriate measurement technique (time study and PMTS) and apply it to measure the standard time for the work involved (*Objective 2 and Syllabus Item 3)*. *Category A*

4. To be able to design a work sampling study, apply it to variable work situation, analyse the results, and estimate the standard time for the work involved (*Objective 3 and Syllabus Item 3)*. *Category A*

5. To ecognize the objectives of layout planning in both manufacturing, and service companies and evaluate its effectiveness, *Objective 4 and Syllabus Item 4)*. *Category A*

6. To apply suitable layout planning techniques, and to recognise their limitations when considering space requirements and availability and building configurations, *Objective 4 and Syllabus Item 4)*. *Category A*

# Matching Assessment Tasks and their Criteria with Subject Learning Outcomes

| | | Criteria | Learning Outcomes | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 |
| Assignment Productivity | Individual (2%) | • Specification of Five suitable and concisely presented objectives<br>• Their relevance to the organization for productivity improvement | √ | | | | | |
| Case Study 1 – Packing Parcels in the Packing Department of a Retail Department Store | Individual – 1 (2.33%) | Task 1<br>• The structure and presentation of the chart drawn<br>• The accuracy in portraying the actual situation<br>• Its ability to be critically analysed | | √ | | | | |
| | Individual – 2 (2.33%) | Task 2<br>(same as Task 1) | | √ | | | | |
| | Individual – 3 (2.33%) | Task 3<br>(same as Task 1) | | √ | | | | |
| | Group (7%) | Task 4<br>The practicality and creativity of ideas suggested coupled with the way in which they are presented. | √ | | | | | √ |
| | | Task's 5 and 6<br>The recognition as to whether the existing staffing level can ensure the guarantee can be kept or otherwise. | √ | | | | | |
| | | Task 7<br>• The accuracy and practicality of the recommendation.<br>• Its presentation | √ | | | | | |
| | | Task 8<br>• The number, practicality of other options considered<br>Creative ideas, i.e. the extent to which a student group can "think out of the box" | √ | | | | | |

# Matching Assessment Tasks and their Criteria with Subject Learning Outcomes

| | | Criteria | Learning Outcomes | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 |
| Case Study 2 - Insurance Claims Processing | Group – 1 (3%) | Task 1<br>• Approach towards staff and using the chain of command<br>• Soliciting cooperation and ideas from staff<br>• Sensitivity when interviewing staff regarding redundancy issues<br>• Dealing with resistance to change | √ | | | | | |
| | Individual (5%) | Task 2<br>• The structure and presentation of the chart drawn<br>• The accuracy in portraying the actual situation<br>• Its ability to be critically analysed<br>• Ammendmants to the existing procedure | | √ | | | | |
| | Group – 2 (3%) | Task 3<br>• Accuracy of the project duration<br>• Important issues connected with project duration<br>• Presentation of the results | √ | √ | | | | |
| Test 1 | Individual (15%) | Question 1 (5%)<br>• The topics and mode of delivery covered with reasons relative to the type of industry<br>• The depth of treatment relative to the participants and the time available<br>• The overall structure and sequence of topics delivered<br>• Presentation | √ | | | | | |
| | | Question 2 (5%)<br>• The approach and accuracy of the answers recognising simple arithmetic errors as compared to logic errors<br>• Presentation | | | √ | | | |
| | | Question 3 (5%)<br>• The overall structure and presentation of the chart drawn<br>• The use of the ISO symbols for flowcharting<br>• The use of connectors to break the flowchart in logical blocks<br>• The level of detail | | √ | | | | |

# Matching Assessment Tasks and their Criteria with Subject Learning Outcomes

| | | Criteria | Learning Outcomes | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 |
| Case Study 3 – Forms Design and Screen Layout | Individual – 1 (7%) | Task 1<br>• Overall layout, use of space, clarity of instructions, suitable margins, adequate spacing, sequence of information entry<br>• Presentation | √ | √ | | | | |
| | Individual -3 (7%) | Task 2<br>• Overall layout, use of space, clarity of instructions, suitable margins, adequate spacing, sequence of information entry, degree of user friendlyness<br>• Presentation | √ | √ | | | | |
| Case Study 4 – Analysing the Workload in a Sales Office | Group (15%) | Part 1<br>• The manner in which the data is analyses and the accuracy of the standards derived.<br>• The recommended application method and the recognition of its limitations.<br>• The presentation of the results and the extent to which they can be understood. | | | √ | √ | | |
| | | Part 2<br>• The presentation and practicality of the results on an Excel spreadsheet<br>• The extent to which the results can be used and their limitations. | | | √ | | | |
| Laboratory - Layout Planning | Individual (14%) | • The extent to which activity relationships are met<br>• Utilisation and practicality of space provided compared with that specified<br>• Overall presentation, preferably the final arrangement (this should be on Microsoft Visio or similar)<br>• The recommended application method and the recognition of its limitations<br>• The presentation of the results and the extent to | | | | | √ | √ |
| Test 2 | Individual (15%) | Question 1 - Number of “right” and “wrong” answers | | | √ | | | |
| | | Question 2<br>• The approach and accuracy of the answers recognising simple arithmetic errors as compared to logic errors<br>• The substance of the answer, its limitations and how they could be rectified<br>• Presentation | | | | √ | | |

**The matching of Assessment Components to Learning Outcomes may vary from year to year because different assessment components will be used**

# Matching of Learning Outcomes to *Teaching*, *Practice*, and *Measurement*

| Learning Outcome | Teaching (Lecture) | Practice (Case Study, Laboratory, Assignment, etc.) | Measurement (Assessment) |
|---|---|---|---|
| No 1 | *Syllabus Item 1, Category A* | • Productivity Assignment,<br>• Case Study 1, Group Work, Task's 4, 5, 6, 7, 8<br>• Case Study 2, Group Work, Task's 1, 3<br>• Case Study 3 | • Productivity Assignment,<br>• Case Study 1, Group Work, Task's 4, 5, 6, 7, 8<br>• Case Study 2, Group Work, Task's 1, 3<br>• Test 1<br>• Case Study 3 |
| No 2 | *Syllabus Item 2, Category A* | • Case Study 1 – Three Individual Assignments Group Work, Task's 2, 3<br>• Case Study 3 | • Case Study 1 – Three Individual Assignments Group Work, Task's 2, 3<br>• Test 1<br>• Case Study 3 |
| No 3 | *Syllabus Item 3 Category A* | Case Study 4, Part's 1 and 2 | • Test 1<br>• Case Study 4, Part's 1 and 2<br>• Test 2 |
| No 4 | *Syllabus Item 3, Category A* | Case Study 4, Part 1 | • Case Study 4, Part 1<br>• Test 2 |
| No 5 | *Syllabus Item 4. Category A* | Laboratory | Laboratory |
| No 6 | *Syllabus Item 4, Category A* | • Case Study 1, Group Work, Task 4<br>• Laboratory | • Case Study 1, Group Work, Task 4<br>• Laboratory |

*Category A: Professional/Academic knowledge and skills*
*Category B: Attributes for all-roundedness*

# Programme Aims of BEng(Hons) in ISE

(i) be versed in the activities that persons employed in the various engineering disciplines may be called upon to fulfil in the execution of their duties (through the common first year), and in particular, the area of industrial and systems engineering (through the latter years of the programme);

(ii) have sufficient understanding of the application of procedures (the application of principles, techniques and methods), and their limitations so that they can select the most appropriate for a particular situation;

(iii) be capable of formulating problems, recognising areas in an organisation where improvements are necessary devising and implementing strategies aimed at producing solutions;

(iv) have gained some experience in applying their knowledge to solve problems of the type and, eventually, of the complexity that may be encountered in practice;

(v) have been exposed to a range of academic activities of such style and content as will enable them to develop effective communication skills (oral, written, graphical and numerate);

(vi) have been exposed to a range of activities that will enable them to both effectively work individually on their own initiative, and as a team members with others;

(vii) an awareness of the responsibilities and ethics of professional engineers in the modern world and a realisation of the constraints imposed on the enterprise by economic and environmental factors;

(viii) have been exposed to a range of activities that will enable them to seek, learn and apply information that is pertinent to the work they are undertaking;

**Programme Aim (ix) has been omitted**

# Learning Outcomes of BEng(Hons) in ISE

(i) To be versed in the activities of various engineering disciplines and in particular, industrial and systems engineering, so that graduates are able to appreciate and interact with other engineering professionals during execution of their duties situation (Item (i) of 1.1 above, and No 4 of ABET). *Category A*

(ii) To be able to apply knowledge, procedures (principles, techniques and methods), of engineering and, where appropriate, mathematics and science, to industrial and systems engineering problems, and to have sufficient understanding of their limitations so that they can select the most appropriate for a particular situation (Items (ii) of 1.1 above, and Nos 1, 2, 3, and 11 of ABET). *Category A*

(iii) To be able to formulating problems, recognising areas in organisations where improvements are necessary, and devise and implementing strategies to produce solutions (Item (iii) of 1.1 above, and No 5 of ABET). *Category A*

(iv) To have gained some experience in applying their knowledge to solve problems of the type and, eventually, of the complexity that may be encountered in practice (Item (iv) of 1.1 above, and No 11 of ABET). *Category A*

(v) To be able to effectively communicate (oral, written, graphical and numerate), so as to enable them to function on multi-disciplinary teams and as individuals where cooperation from others is necessary (Item (v) of 1.1 above, and Nos 4, and 7 of ABET). *Category B*

(vi) To be able to effectively work individually on their own initiative, and as a team members with others (Item (vi) of 1.1 above, and Nos 4 of ABET). *Category B*

(vii) To be awareness of the responsibilities and ethics of professional engineers in the modern world and possess a realisation of the constraints imposed on the enterprises by economic and environmental factors (Item (vii) of 1.1 above, and Nos 6, 8, and 10 of ABET). *Category B*

(viii) To possess the ability to engage in lifelong learning (Item (viii) of 1.1 above, and Nos 9 of ABET). *Category B*

**Learning Outcome (ix) has been omitted (concerned with meeting HKIE academic requirements)**

# Matching of *Learning Outcomes* of Subject *(ISE318)* against *Programme Outcomes* of the *BEng(Hons) in ISE*

| | Learning Outcome of ISE318 | | | | | | |
|---|---|---|---|---|---|---|---|
| **Programme Outcome** | **No 1** | **No 2** | **No 3** | **No 4** | **No 5** | **No 6** | **Comment** |
| **(i)** | √ | | | | | | This is only applicable in the introductory part of the subject where the role of industrial engineering in organisations is introduced |
| **(ii)** | | √ | √ | √ | √ | √ | The subject is largely focused (as its title implies) on learning and applying the techniques and methods of industrial engineering to organisations albeit in a simplified form that students will encounter in practice when they eventually go out to work |
| **(iii)** | | √ | √ | √ | √ | √ | |
| **(iv)** | | √ | √ | √ | √ | √ | |
| **(v)** | | √ | √ | √ | √ | √ | In the context of the work that students have to submit in respect of written, graphical and numerate work |
| **(vi)** | | √ | √ | √ | | | The work that students practice and submit as assessment components requires to them work both individually (through individual assignments in the case studies and the two tests) and in the case studies |
| **(vii)** | | | | | | | Not covered to any extent apart from economic constraints of introducing new equipment and facilities |
| **(viii)** | | √ | | | | | To a limited extent in the context of answering questions in the case studies requires students to conduct some degree of self study |

# An Example of Subject Results

| | BEng (Hons) ISE | | BEng (Hons) ISE Major | | BSc (Hons) EEEB | | BSc (Hons) LEM | | Double Degree | | HD - 1 ISE | | HD -2 ISE | | Exchange Students | | **TOTAL** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No | % | No | % | No | % | No | % | No | % | No | % | No | % | No | % | No | % |
| A+ | | | | | | | 1 | 1.9 | | | | | | | | | 1 | 0.4 |
| A | 2 | 5.4 | | | | | 5 | 9.3 | 3 | 14.3 | | | 1 | 2.7 | | | 11 | 4.5 |
| B+ | 5 | 13.5 | | | | | 6 | 11.1 | 1 | 4.8 | | | 11 | 29.7 | | | 23 | 9.4 |
| B | 21 | 56.8 | 1 | 100 | 9 | 29 | 33 | 61.1 | 12 | 57.1 | 20 | 33.3 | 20 | 54.1 | 3 | 100 | 119 | 48.8 |
| C+ | 8 | 21.6 | | | 16 | 51.6 | 8 | 14.8 | 1 | 4.8 | 31 | 51.7 | 2 | 5.4 | | | 66 | 27.0 |
| C | 1 | 2.7 | | | 5 | 16.1 | 1 | 1.9 | 3 | 14.3 | 7 | 11.7 | | | | | 17 | 7.0 |
| D+ | | | | | | | | | 1 | 4.8 | | | 2 | 5.4 | | | 3 | 1.2 |
| D | | | | | 1 | 3.2 | | | | | 1 | 1.7 | | | | | 2 | 0.8 |
| F | | | | | | | | | | | 1 | 1.7 | 1 | 2.7 | | | 2 | 0.8 |
| **Total** | 37 | 100 | 1 | 100 | 31 | 100 | 54 | 100 | 21 | 100 | 60 | 100 | 37 | 100 | 3 | 100 | 244 | 100 |
| Subject Grade Average of the Class: Grade C+/B | | | | | | | | | | | | | | | | | | |

# Subject Results: Comparison from 2001-2002 to 2006-2007 (Figures in Percentages)

| Grade | 2001-2002 | 2002-2003 | 2003-2004 | 2004-2005 | 2005-2006 | **2006-2007** |
|---|---|---|---|---|---|---|
| A+ | | | | | | **>1** |
| A | 7 | 6 | 4 | 3 | 7 | **5** |
| B+ | 10 | 22 | 10 | 27 | 25 | **9** |
| B | 43 | 50 | 48 | 52 | 68 | **49** |
| C+ | 34 | 9 | 26 | 13 | 17 | **27** |
| C | 6 | 3 | 12 | 6 | 1 | **7** |
| D+ | | | | 1 | | **1** |
| D | | | | | | **1** |
| F | | | | | 1 | **1** |
| Average Grade | C+/B | B | B | B | B | C+/B |
| Class Size | 61 | 32 | 69 | 101 | 118 | 244 |
| **Total** | 100 | 100 | 100 | 100 | 100 | **100** |

There is a wider spread compared to previous years, probably caused by the wide variations in the classes. Similar average grades over all years