  

**ASSESSMENT REPORT for ASSURANCE OF LEARNING**

1. **Course Information**

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| **Program** | : | Yang Ye | | | |
| **Academic Year** | : | AY19/20 | **Mini Term** | : | 2 |
| **Course Code & Title** | : | FE8828 Programming Web Applications in Finance | | | |
| **Instructor(s)** | : | Yang Ye | | | |
| **Pre-requisites** | : |  | | | |
| **No. of AUs** | : | 1.5 AUs | | | |
| **Class Duration** | : | \_3.5\_ Hours x \_6\_ Sessions | | | |

1. **Course Description (**copy-and-paste from Course Outline)

This course aims to teach how to process and analyze data, run statistical and financials model and two threads leading to build application in finance analytics. It includes three parts:

1. How internet works, how to create a website with cloud computing infrastructure like Amazon Web Services.

2. How to use data manipulation and data visualization to carry out exploratory data analysis and reproducible research.

3. How to build data-driven reports and dashboard, interactive rich data visualization.

4. How to build data model and run predictive modeling.

5. How to build finance application which combines data, model and analysis.

6. Latest internet technology in cryptocurrency and payment system like Bitcoin and Blockchain

1. **Learning Goal / Objective**

(Besides Acquisition of Knowledge, please check at least one learning goal you will assess and measure)

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| --- | --- | --- |
| **LEARNING GOAL** | **LEARNING OBJECTIVE** | **CHECK** |
| **TASK SKILLS** | | |
| **Acquisition of Knowledge (AK)** | *Please note that Acquisition of Knowledge applies to all courses and therefore overall scores would be taken as the measurement of students’ performance of the learning goal.* |  |
| **Ethical Reasoning (ER)** | The ability to recognize and understand ethical issues, and apply sound ethical reasoning. |  |
| **Quantitative Literacy Skills (QLS)** | The ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate). |  |
| **PEOPLE SKILLS** | | |
| **Oral Communication**  **&**  **Written Communication (C)** | The ability to communicate well with others verbally so that it clearly expresses the intended message and is understandable and useful to the receiving party. |  |
| The ability to communicate well with others in writing so that it clearly expresses the intended message and is understandable and useful to the receiving party. |  |
| **Teamwork & Interpersonal Skills**  **(TIS)** | The ability to work effectively with others in a group setting. |  |
| **Motivation & Development of Self & Others**  **(MDSO)** | The ability to develop a better understanding of one’s strengths and weaknesses, and learn to view others and mistakes positively as sources of personal and professional development. |  |

1. **Assessment Tool** 
   1. **Assessment Guide / Instructions**

*(Indicate mark allocation, if applicable)*

|  |  |
| --- | --- |
| **Assessment Component** | **%** |
| Assignment | 50 |
| Class Participation | 10 |
| Final Project (Group) | 40 |
| **Total** | **100** |

* 1. **Assessment Measure (Rubric)**

**Quantitative Literacy Skills Rubric**

**Learning Objective:** Quantitative Literacy (QL) – also known as Numeracy or Quantitative Reasoning (QR) – is a "habit of mind," competency, and comfort in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate).

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| --- | --- | --- | --- |
| **Traits** | | **Performance** | |
| **Interpretation** | Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words). | **Not Yet**  Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means. | **Substantially Developed**  Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information. |
| Evaluation: Not Yet 1 2 3 4 5 6 7 8 9 10 Substantially Developed | |
| **Representation** | Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words). | **Not Yet**  Completes conversion of information but resulting mathematical portrayal is inappropriate or inaccurate. | **Substantially Developed**  Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding. |
| Evaluation: Not Yet 1 2 3 4 5 6 7 8 9 10 Substantially Developed | |
| **Calculation** | Ability to perform calculations. | **Not Yet**  Calculations are attempted but are both unsuccessful and are not comprehensive. | **Substantially Developed**  Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.). |
| Evaluation: Not Yet 1 2 3 4 5 6 7 8 9 10 Substantially Developed | |
| **Application/ Analysis** | Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis. | **Not Yet**  Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is uncertain about drawing conclusions from this work. | **Substantially Developed**  Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work. |
| Evaluation: Not Yet 1 2 3 4 5 6 7 8 9 10 Substantially Developed | |
| **Presentation** | Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized). | **Not Yet**  Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. | **Substantially Developed**  Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explicates it with consistently high quality. |
| Evaluation: Not Yet 1 2 3 4 5 6 7 8 9 10 Substantially Developed | |

**Ethical Reasoning Rubric**

**Learning Objective:** The ability to recognize and understand ethical issues, and apply sound ethical reasoning.

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| --- | --- | --- |
| **Traits** | **Performance** | |
| **Ethical Sensitivity or Awareness**  Ability to sieve out, recognize and identify ethical issues and risks in the case scenario. | **Not Yet**  Unable to identify ethical elements in the case scenario. | **Substantially Developed**  Able to identify ethical elements in the case scenario. |
| Evaluation: Not Yet 1 2 3 4 5 6 7 8 9 10 Substantially Developed | |
| **Ethical Knowledge, Understanding and Judgment**  Ability to raise pertinent questions or clarify relevant information to obtain a clearer understanding and/or form an appropriate judgment of the issues involved in the case scenario. | **Not Yet**  Unable to demonstrate adequate knowledge and understanding of relevant concepts and how they work. | **Substantially Developed**  Able to identify some of the relevant ethical notions relevant to understanding and forming an appropriate judgment. |
| Evaluation: Not Yet 1 2 3 4 5 6 7 8 9 10 Substantially Developed | |
| **Ethical Reasoning and Solution**  Ability to apply sound and robust ethical reasoning in developing viable solutions to resolve the problems or issues. | **Not Yet**  Unable to apply ethical reasoning to resolve the relevant problems or issues. | **Substantially Developed**  Able to apply ethical reasoning logically and rationally to resolve the problems or issues. |
| Evaluation: Not Yet 1 2 3 4 5 6 7 8 9 10 Substantially Developed | |

1. **Quantitative Assessment**

*Please check where applicable*

|  |  |
| --- | --- |
| I have keyed in the scores in eUreka/NTULearn site.  I need not complete Section 5. |  |
| I am not using eUreka/NTULearn site for the rubric scores.  I will complete Section 5. |  |

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| --- | --- | --- |
| **Learning Goal**  (refer to section 3) | : | **Quantitative Literacy Skills (Individual Assignment)** |
| **Learning Objective**  (refer to section 3) | : | Quantitative Literacy (QL) – also known as Numeracy or Quantitative Reasoning (QR) – is a "habit of mind," competency, and comfort in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate). |
| **No. of students assessed** | : | 25 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Performance Criteria / Traits** | **Below Expectations**  *(<50%)*  *(no. of students)* | **Met Expectations**  *(>=50%, <75%)*  *(no. of students)* | **Above Expectations**  *(>=75%)*  *(no. of students)* | **Mean Score[[1]](#footnote-1)** |
| **Quantitative Literacy Skills**  **(Individual Assignment)** |  |  |  |  |
| Interpretation | 3 | 12 | 10 | 2.28 |
| Representation | 0 | 4 | 21 | 2.84 |
| Calculation | 1 | 14 | 10 | 2.36 |
| Application/ Analysis | 1 | 14 | 10 | 2.36 |
| Presentation | 1 | 14 | 10 | 2.36 |
| Average | 1.2 | 11.6 | 12.2 | 2.44 |
| Percentage | 4.8% | 46.4% | 48.8% |  |

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| --- | --- | --- |
| **Learning Goal**  (refer to section 3) | : | **Quantitative Literacy Skills (Group Project)** |
| **Learning Objective**  (refer to section 3) | : | Quantitative Literacy (QL) – also known as Numeracy or Quantitative Reasoning (QR) – is a "habit of mind," competency, and comfort in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate). |
| **No. of students assessed** | : | 25 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Performance Criteria / Traits** | **Below Expectations**  *(<50%)*  *(no. of students)* | **Met Expectations**  *(>=50%, <75%)*  *(no. of students)* | **Above Expectations**  *(>=75%)*  *(no. of students)* | **Mean Score[[2]](#footnote-2)** |
| **Quantitative Literacy Skills**  **(Group Project)** |  |  |  |  |
| Interpretation | 10 | 15 | 0 | 1.6 |
| Representation | 0 | 20 | 5 | 2.2 |
| Calculation | 0 | 25 | 0 | 2 |
| Application/ Analysis | 5 | 15 | 5 | 2 |
| Presentation | 5 | 15 | 5 | 2 |
| Average | 4 | 18 | 3 | 1.96 |
| Percentage | 16% | 72% | 12% |  |

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| **Learning Goal**  (refer to section 3) | : | **Ethical Reasoning (Group Project)** |
| **Learning Objective**  (refer to section 3) | : |  |
| **No. of students assessed** | : | 25 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Performance Criteria / Traits** | **Below Expectations**  *(<50%)*  *(no. of students)* | **Met Expectations**  *(>=50%, <75%)*  *(no. of students)* | **Above Expectations**  *(>=75%)*  *(no. of students)* | **Mean Score[[3]](#footnote-3)** |
| **Ethical Reasoning**  **(Group Project)** |  |  |  |  |
| Ethical Sensitivity or Awareness | 0 | 0 | 25 | 3 |
| Ethical Knowledge, Understanding and Judgment | 0 | 0 | 25 | 3 |
| Ethical Reasoning and Solution | 0 | 0 | 25 | 3 |
| Average | 0 | 0 | 25 | 3 |
| Percentage | 0% | 0% | 100% |  |

1. **Qualitative Assessment**

**Based on the quantitative assessment, what is your analysis and description of whether the students have satisfactorily demonstrated attainment of the learning goal(s) and objective(s)?**

**QLS (Individual Assignment)**

Yes. In general, the students have attained the skills and applied well in the assignments. Students can attain the basic marks by getting the correct answer but need to make more efforts in thinking deeper, considering corner cases and sharpening the answers in order to attain higher marks. This year's students bases have enlarged with different levels of mastery. For about 1/5 is below or around the average, they can recite the existing algorithms and have demostrated basic skillsets of quantitative programming. For about 4/5 above the average, they can think and code more than the given information. They have demostrated what's more than basic skillsets.

**QLS (Group Project)**

All five groups have accomplished the coding program achieving majority of requirements. Some groups have done some questions exceptionally well but didn't do others well. And I can identify the best answer for each question coming from different group. This shows questions requirements are diverse. The group assignments score are lower than individual assignments means that it requires students to extend their application beyond what's taught. Many have demostrated so.

**Ethical Reasoning**

All students have fulfilled the requirements. In the assignments, they have practiced credit control and calculated trading profit and loss and understands the impact of them.

**What is your improvement plan on how the course assessment process, or the course itself, can be changed in the future to achieve a more desirable level of attainment of learning objective(s)?**

**QLS (Individual Assignment)**

For next year, the course notes will be adapted to be little bit more concicse to make it easier to follow for the broad base of students. The individual assignment questions would be the same as current plan.

**QLS (Group Project)**

I would like to combine Q2 and Q3 and have a different Q3 to make assignment more diverse.

**Ethical Reasoning**

I would like to combine Q2 and Q3 and have a different Q3 to make assignment more diverse. It will be about predictive modeling, along with it, we bring in the assessment of how to think critically and carry out ethical judgement.

**CHECKLIST FOR ASSESSMENT REPORT**

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|  |  | **Pre-Course Preparation**  *– submit Items 1-4 to Division/Program Office at least 2 weeks before course commences* |
| ✓ |  | **Course Information** |
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| ✓ |  | **Course Description** (attach Course Syllabus) |
|  |  |  |
| ✓ |  | **Learning Goal & Objective** |
|  |  |  |
| ✓ |  | **Assessment Tool**  Assessment Guide/Instruction  Assessment Measure (Rubric) |
|  |  |  |
|  |  | **During Course** |
| ✓ |  | **Inform Students of Learning Goal(s), Objective(s) & Scoring Rubric(s)**  (i.e. how they will be assessed) |
|  |  |  |
| ✓ |  | **Assess Students’ Work Based on Learning Objective(s) with Detailed Criteria/Trait Scores**  Key in the results in eUreka/NTULearn site OR  Tabulate by learning goal(s) on frequency distribution table  (Band 1 = below expectations, 2=met expectations or 3=above expectations) |
|  |  |  |
| ✓ |  | **Provide Feedback to Students (use rubric as a guide)**  via eUreka/NTULearn site  OR Return scored rubric (soft or hard copy) to students |
|  |  |  |
| ✓ |  | **Make Copies of Students’ Assignments & corresponding Scored Rubrics**  (2 “above expectations”, 2 “met expectations” & 2 “below expectations” samples) |
|  |  |  |
|  |  | **Post-Course Report**  – submit to Division Office not later than 2 weeks after course ends |
| ✓ |  | 1. **Quantitative Assessment**   - Provide Criteria/Trait Scores from Assessment of Learning Objective(s)  - Excel Worksheet to tally scores on Quantitative Assessment |
|  |  |  |
| ✓ |  | 1. **Qualitative Assessment**   - Reflect and Propose Changes |
|  |  |  |
| ✓ |  | **Submission to NBS Accreditation Office**  Completed all sections of AOL report  Rubric/Trait Scores in Excel (with the exception of those who conducted assessment via eUreka)  Assignment/Assessment Samples + corresponding Scored Rubric |
|  |  |  |
| For enquiries, email NBS Accreditation Office: nbsaccro@ntu.edu.sg  Thank you for your Assurance of Learning. | | |

1. Based on scoring key: 1=below expectations; 2=met expectations; and 3=exceeded expectations. [↑](#footnote-ref-1)
2. Based on scoring key: 1=below expectations; 2=met expectations; and 3=exceeded expectations. [↑](#footnote-ref-2)
3. Based on scoring key: 1=below expectations; 2=met expectations; and 3=exceeded expectations. [↑](#footnote-ref-3)