

MODULE DESCRIPTOR

Guidelines for completion are available¹ as are Red Guides on developing a new module and Delivering a module².

1. Module Code	MSDE 232	2. Title of new module	Applied Statistics in Manufacturing
3. Subject Division <i>where relevant</i>	Engineering		
4. Module level <i>4, 5, 6 etc.</i>	4	5. Module Tutor	Kwang Ho Kook
6. Credit points <i>10, 20,30 etc</i>	10	7. Year long or semester based	Semester
8. Type of module <i>eg standard, dissertation, work-based study A full list of module types is provided in the guidelines¹.</i>	Standard		
9. Location(s) of delivery <i>For collaborative delivery, please state name(s) of institution(s) with country and start month(s) for each. A full list is available on the SITS help file in eLP</i>	SeoulTech, Korea, September		

MODULE DESCRIPTIONS

- 10. Synopsis of module** (SITS Module Descriptor Sequence 0001)
A brief overview of aims, learning outcomes, learning, teaching, assessment, & feedback methods, and rationale

This module aims to provide the student with the basic concepts of statistics. The student will learn about the sample statistics, various sample distributions and their applications. This module will enable the students to perform statistical analysis of the data obtained in a manufacturing system. Assessment is through a final examination at the end of the course plus homework assignments.

- 11. Indicative reading list or other learning resources** (SITS 0002)

1. Recommendations for purchase by students

N/A

2. Books

1) Principles of Statistics for Engineers and Scientists, W. Navidi, McGraw Hill, 2010

¹ <http://northumbria.ac.uk/sd/central/ar/qualitysupport/approval/forms/>

² <http://northumbria.ac.uk/sd/central/library/marcel/redguides/browse/?view=Standard>

- 2) Introduction to Probability and Statistics for Engineers and Scientists, S.M. Ross, Elsevier Academic Press, 3rd edition.

3. Journal Articles

N/A

4. Journals and Newspaper Titles

N/A

5. Databases and Websites

N/A

6. Any Other Resources

N/A

12. Outline syllabus (SITS 0003)

A list of module contents

Overview of Applied Statistics

Introduction to the statistics. Terminologies and typical application areas of applied statistics.

Basic Concepts of Statistics

Graphical and numerical representation methods of the data. Introduction to the sample space, event and the probability.

Special Random Variables and Distributions

Definition of the random variable. Special discrete and continuous probability distributions such as Bernoulli, Binomial, Poisson, Normal and Exponential distributions.

Distributions of the Sampling Statistics

Central Limit Theorem. The sampling distributions of the sample mean and sample proportion.

Parameter Estimation

Point estimators. Confidence interval of the sample mean and sample proportion for one population and two populations.

Hypothesis Testing

Hypothesis testing for the population mean and population proportion when the sample size is small and large.

Regression

Prediction of the value of one variable from known values of other related variables. Simple linear regression and multiple linear regression.

13. Aims of module (SITS 0004)

Broad statement of educational intent and overall purpose of module

This module aims to provide the student with the ability to deal with statistical decision making problems which occur in a manufacturing system. The student will learn how to use statistical computer software that can be used to solve statistical problems. Later students will be given engineering problems in which they will be asked to use computer software to obtain the solutions.

14. Learning outcomes (SITS 0005)

State what expected to know and/or be able to do at end of module

Upon completion of the module students will be able to:

1. Apply mathematical methods relevant to the Engineering subjects covered. (A2)
2. Define problems and identify the key issues/parameters affecting their solution. (B1).
3. Use appropriate methods for modeling and analyzing manufacturing engineering problems. (C2).
4. Manipulate and sort data and present results in the most appropriate way. (D1).

15. Pre-requisite(s) (SITS 0006)

Any module which must already have been taken at a lower level, or any stipulated level of prior knowledge required

None

16. Co-requisite(s) (SITS 0007)

Modules at this level which must be taken with this module

None

17. Distance learning delivery (SITS 0008)

If the module is offered (wholly or in part) by distance learning, please give detail of delivery arrangements and the specific resources required e.g. materials, communication facilities, hardware, software etc.

None

18. Learning and teaching strategy (SITS Module Descriptor Sequence 0009)

The module consists of a number of three hour/week lectures and several two hour computer labs. The lectures will provide students with basic statistical methods based on textbook. Labs will provide students with the knowledge of how to use computer software that can be applied to solve statistical problems. Students will submit assignments to practice the statistical methods learned in the lecture and a final exam will provide students with a test of their understanding of all of the work covered

19. Assessment and feedback strategy (SITS Module Descriptor Sequence 0010)

Please provide details of assessment (formative and summative) and indicate how students will be provided with feedback on their performance. (A breakdown of summative tasks is also provided in section 23.) If the module or an assessment component is exempt from the Anonymous Marking Policy please indicate this below.

a. Summative assessment and rationale for tasks
 Assessment will be based on a final exam worth 70% which will test the students understanding of the theory taught in the lectures and will be scheduled at week 15.
 Four assignments will be given to aid the students understanding of topics covered in the lectures and will consist of problem solving.

b. Additional formative assessment – detail of process and rationale
 Formative assessment will be via verbal feedback during the lab periods.

c. Indication of how students will get feedback and how this will support their learning
 Feedback will be given in the form of verbal(formative) during the lab periods and summative feedback will be via written comments on the students' assignment.

20. Implications for Choice (SITS Module Descriptor Sequence 0011)

Possible follow-on modules, or exclusions, or modules which require this one as a pre-requisite

None

21. Notional Student Workload (NSW) for each mode of delivery

(SITS Module Descriptor Sequence 0012)

<i>Complete a separate table where the distribution of NSW differs for a particular delivery pattern - Mode of Delivery FT</i>			
Activity type*	Hours	KIS category	KIS category hours
Lecture	35	Scheduled	
Seminar			
Tutorial			
Project Supervision			
Demonstration			
Practical classes and workshops	10		
Supervised time in studio/ workshop			
Fieldwork			
External visits			
Work based learning			
Guided independent study	55	Independent	
Placement		Placement	
Year abroad			
Total workload <i>200 hours for 20 credit module, 100 for 10 credit module etc.)</i>	100		

SUMMATIVE ASSESSMENT

22. Form of Reassessment

Either synoptic or non-synoptic reassessment

	Y/N
Synoptic reassessment <i>One form of reassessment that tests all module learning outcomes</i>	Y
Non-synoptic reassessment <i>Where module referred overall, individual failed components of assessment are reassessed</i>	

23. Component Assessment

To be completed for each component of assessment

Sequence <i>001, 002 etc.</i>	Activity type ³ <i>indicate ONE of the following types: AO Attendance only CP Clinical Placement CW Coursework</i>	Brief description of assessment <i>e.g. type/length of</i>	Weighting % or Pass/Fail (for grade only components) <i>Note: % weightings</i>	Final assessment Y/N

³ For KIS reporting, CP and PRE will be aggregated together as 'Practical' assessment types

Module Descriptor

	EXAM PRE Presentation	<i>exam, type/ word limit of coursework</i>	<i>should add up to 100% for module overall</i>	
001	CW	Assignment (4 times/ semester – 12 problems each)	30	
002	EXAM	Final exam/ 2 hr	70	Y

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24. **Date of SLE Approval**

25. **Subject code**
This ensures that the correct area receives appropriate funding and should be completed in consultation with the School Registrar or nominee. Advice can also be sought from Financial Planning.

26. **Module mark scheme assigned⁴**

27.	Component mark scheme assigned³ <ul style="list-style-type: none"> For each component listed in section 23 indicate the mark scheme attached. Note that for synoptic mark schemes (ie MOD1, MOD3 and M50SY only) an additional component should be entered for the reassessment with sequence 900 and assessment type SYN. 		
	001		

28.	Date of entry onto SITS	<input type="text"/>
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29.	LOG OF CHANGES POST APPROVAL <i>Please indicate any changes to the approved module descriptor from 2012/13 onwards</i>			
	Section No.	Brief description of change	Date of approval	Semester and year of first implementation

³A list of marking schemes (module and component) can be accessed from <http://northumbria.ac.uk/sd/central/ar/qualitysupport/approval/forms/>