1.	Name of Course/Module	Probability and Statistics
2.	Course Code	TEM1116
3.	Status of Subject	Core for B.IT Information Technology Management
4.	MQF Level/Stage	Bachelor Degree – MQF Level 6
5.	Version (state the date of the last Senate approval)	June 2012
6.	Requirement for Registration	TMT1171 Mathematical Techniques 1 or TMT1111 Numerical Mathematics
7.	Name(s) of academic/teaching staff	Goh Pey Yun Pang Ying Han Lim Kian Ming
8.	Semester and Year offered	Trimester 2 (Beta Level)

9.	Objective of the course/module in the programme :
	To provide students with an understanding of basic knowledge of probability and statistics. In particular, the course focuses on the principles, techniques, and practices relevant to the application of probability and statistics techniques.

10.	Learning Outcomes :
	At the completion of the subject, students should be able to:
	LO1: Describe the basic concepts of probability and statistical techniques (Cognitive, Level 1)
	LO2: Define Interpret the probability models, expected values, variance, and covariance (Cognitive, Level 2)
	LO3: Evaluate the methods of probability, estimation and hypotheses testing (Cognitive, Level 6)
	LO4: Apply the concepts of regression analysis and ANOVA techniques (Cognitive, Level 3)
	LO5: Analyse the results get from probability and statistical techniques (Cognitive, Level 4)

11.	Synopsis:
	This course studies the key principles of probability and statistics, which mainly use for data analysis and evaluation. Covered topics include: discrete and continuous random variables, Binomial, Poisson, and Normal random variables, joint probability distributions, point estimation and interval estimation , testing of hypothesis, linear regression and analysis of variance.
	Kursus ini mempelajari prinsip-prinsip utama kebarangkalian dan statistik. Topik meliputi pembolehubah rawak diskrit dan selanjar, pembolehubah rawak binomial, Poisson, dan normal, taburan kebarangkalian tercantum, penganggaran titik dan penganggaran selang, ujian hipotesis, regresi linear dan analisis teknik varians.

12.	Mapping of Subject to Programme Outcomes :	
	Programme Outcomes	% of Contribution
	PO1: Apply soft skills in work and career related activities.	44.44
	PO2: Demonstrate knowledge and understanding of fundamental concepts, principles and best practices.	55.56
13.	Assessment Methods and Types :	

	Method and Type	Description/Details	Percentage
	Test		25%
	Quiz		25%
	Final Exam		50%

14.	Details of Subject		

Topics	Mode of Delivery	
	Lecture	Tutorial
1. Discrete and Continuous Probability Distributions Review of discrete and continuous distributions: Binomial, Poisson, Normal, Permutation and Combination, Conditional Probability; mean, variance, and moment generating function.	8	3
2. Functions of Random Variables Joint probability distribution and joint probability density function, marginal distribution, expected value, covariance and correlation; Statistical independence; Transformation of variable; Moment and moment generating function; Linear combination of random variable.	6	2
3. Sampling Distribution Sampling distribution of $\bar{x}$, and S^2; Central Limit Theorem; Approximation for discrete distributions; Sampling distribution for t and F.	6	2
4. Estimation Point Estimation: Bias and unbiased estimator; principle of minimum variance unbiased estimation; Method of moment; Maximum Likelihood estimation. Interval Estimation: Population mean and difference between two population mean using z – distribution and t-distribution; Population variance by χ^2 – distribution, ratio of two variance using F – distribution; Estimation of one and two sample proportion.	6	2
5. One- and Two-Sample Tests of Hypothesis Null and Alternative hypothesis; One-and two-tailed test; P-value; Single sample mean test; Two sample mean test: two-sample pooled t-test and paired t-test; Test on one and two sample proportion; One- and two-sample test for variance.	6	2
6. Simple Linear Regression and Correlation Simple linear regression; Least squares method and its properties; Inferences of regression coefficients; prediction interval; Correlation.	6	2
7. One-Factor Experiments Analysis of variance technique; one-way analysis of variance; Single-Degree-of-Freedom comparison; Test for equality of several variances: Bartlett's Test; Multiple Comparisons: Tukey's Test, Randomized complete block designs.	5	1
Total	**42**	**14**

15.	Tutorials

- Describe the basic concepts of probability and statistical techniques
- Interpretation of the probability models, expected values, variance and covariance
- Evaluation of the methods of probability, estimation and hypotheses testing
- Application of regression analysis and ANOVA
- Probability and Statistical result analysis

16.	Total Student Learning Time (SLT)	Face to Face (Hour)	Total Guided and Independent Learning
	Lecture	42	42
	Tutorials	14	14
	Laboratory/Practical	-	
	Presentation	-	
	Assignment	-	12
	Mid Term Test	2	10
	Final Exam	2	20
	Quizzes	10 times	10
	Sub Total	60	96
	Total SLT	156/40 = 3.9 => 4	
17.	Credit Value	4	
18.	Reading Materials :		
	Textbook	Reference Materials	
	1. J.L. Devore, *Probability and Statistics for Engineering and The Sciences*, 7thEd. Thomson, 2008	2. R.E. Walpole, *Probability and Statistics for Engineers and Statistics*, 8th ed., McMillan, 2007 3. D.C. Montgomery & G. C. Runger, *Applied Statistics and Probability for Engineers*. 3rd ed. John Wiley, 2003	
19.	Appendix (to be compiled when submitting the complete syllabus for the programme) : 1. Mission and Vision of the University and Faculty 2. Mapping of Programme Objectives to Vision and Mission of Faculty and University 3. Mapping of Programme Outcome to Programme Objectives 4. Progarmme Objective and Outcomes (Measurement and Descriptions)		