1.	Name of Course/Module	Artificial Intelligence I
2.	Course Code	TAI1361
3.	Status of Subject	Major for B.IT Artificial Intelligence
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	TDS1191 Discrete Structures AND TCP1241 Computer Programming II
7.	Name(s) of academic/teaching staff	G. Mohamed Hanifa Cheah Wooi Ping Jin Zhe
8.	Semester and Year offered	Trimester 1 (Gamma Level)

9. Objective of the course/module in the programme :

The purpose of this subject is to introduce two commonly used programming paradigms for Artificial Intelligence: Logic Programming through PROLOG, and Functional Programming through LISP. The subject also covers the theoretical aspect of the logical foundations of Artificial Intelligence and the Knowledge Representation and Reasoning with Logic.

10. Learning Outcomes :

At the completion of the subject, students should be able to:

LO1: Comprehend the mean concept of artificial intelligence core concepts such as intelligent agents. (Cognitive, Level 2)
LO2: Appraise problem solving techniques and reasoning & planning algorithms. (Cognitive, Level 6)
LO3: Apply logic programming through PROLOG language on logic problems and problem solving. (Cognitive, Level 3)
LO4: Apply logic programming through LISP language on logic problems and problem solving. (Cognitive, Level 3)

11. Synopsis:

This subject introduces PROLOG and LISP Programming, as well as the logical foundations of Artificial Intelligence.

Memperkenalkan pengaturcaraan PROLOG dan LISP, asas-asas logikal untuk Kecerdasan Buatan.

12. Mapping of Subject to Programme Outcomes :

Programme Outcomes	**% of Contribution**
PO1: Apply soft skills in work and career related activities	25.00
PO7: Demonstrate knowledge and understanding of essential facts, concepts, principles, and theories relating to artificial intelligence	50.00
PO8: Apply principles and knowledge of artificial intelligence in relevant areas	25.00

13. Assessment Methods and Types :

Method and Type	Description/Details	Percentage
Mid Term Test		20.00%
Assignment I (PROLOG)	Report & Presentation	10.00%

	Assignment II (LISP)	Report & Presentation	10.00%
	Final Examination		60.00%

14. Details of Subject

Topics	Mode of Delivery	
	Lecture	Laboratory
1. PROLOG: Declarative Programming Basic statements, data objects, and different types of queries. Prolog database. Recursive data structures and programming techniques.	4	4
2. PROLOG: Procedural Programming Backtracking. Controlling backtracking with the “cut”. Common uses and problems with the “cut”. Negation as failure: “fail” predicate, “cut”-“fail” combination, “not” predicate. Common uses and problems with the “not”.	4	4
3. PROLOG: Input-Output and Built-in Predicates Input and output: reading and writing terms, characters, sentences, and files. Built-in predicates for testing the type of terms, constructing and decomposing terms, etc. Various kinds of equality.	2	2
4. LISP: Syntax, List Structure, Control Structures, Input-Output, Functions, and Higher-Order Functions Evaluation of arguments. Fundamental data types. Global and local variables. List structure and operations. Selections, iterations, and recursions. I/O streams and strings. File I/O. Functions: functional arguments, optional arguments, and keyword arguments. Higher-order functions and abstraction.	6	6
5. LISP: Property Lists, Hash Tables, Arrays, Structures, and Classes Declaring/Defining, accessing, and using property lists, hash tables, arrays, and structures. CLOS: classes, inheritance, generic functions and methods.	4	4
6. Logical Foundations of Artificial Intelligence Propositional and predicate logic. Syntax and semantics. Interpretations and models. Inference Rules. Clausal form. Unification and resolution. Soundness and Completeness. Resolution strategies. SLD resolution. Negation as failure. Logic as a representation and reasoning formalism.	8	8
Total	**28**	**28**

15. Laboratories

1. Familiarize with the PROLOG and LISP programming environments.
2. Learn to debug and trace PROLOG and LISP programs.
3. Weekly programming exercises on PROLOG and LISP.

16.

Total Student Learning Time (SLT)	Face to Face (Hour)	Total Guided and Independent Learning
Lecture	28	28
Tutorials	-	-
Laboratory/Practical	28	14
Presentation	1	3
Assignment	-	10
Mid Term Test	1	3
Final Exam	2	20
Quizzes	-	-
Sub Total	60	78

<table>
<tr><td></td><td>Total SLT</td><td colspan="2">138/40 = 3.45 => 3</td></tr>
<tr><td>17.</td><td colspan="2">Credit Value</td><td>3</td></tr>
<tr><td rowspan="3">18.</td><td colspan="3">Reading Materials :</td></tr>
<tr><td colspan="2">Textbook</td><td>Reference Materials</td></tr>
<tr><td colspan="2">1. Ivan Bratko, Programming in Prolog for Artificial Intelligence, Addison-Wesley, 2011.
2. Peter Seibel, Practical Common Lisp, Apress, 2005.</td><td>1. Paul Graham, ANSI Common LISP 2nd Edition, Prentice Hall, 2001.
2. S. Russell and P. Norvig, Artificial Intelligence: A Modern Approach 2nd Edition, Prentice Hall, 2002.
3. M. A. Covington, Prolog Programming in Depth, Prentice Hall, 1997.
4. J. M. Spivey, An Introduction to Logic Programming through Prolog, Prentice Hall, 1996.
5. W. F. Clocksin and C. S. Mellish, Programming in Prolog 4th Edition, Springer-Verlag, 1995.
6. Stephen Slade, Object-Oriented Common LISP, Prentice Hall, 1998.
7. S. L. Tanimoto, The Elements of Artificial Intelligence Using Common LISP 2nd Edition, Computer Science Press, 1995.</td></tr>
<tr><td>19.</td><td colspan="3">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. Programme Objective and Outcomes (Measurement and Descriptions)</td></tr>
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