

## SUMMARY OF INFORMATION ON EACH COURSE/MODULE

<ul> <li>Course Code Status of Subject Elective Major</li> <li>MQF Level/Stage Note:         Certificate – MQF Level 3         Diploma – MQF Level 6         Masters – MQF Level 7         Doctoral – MQF Level 8         </li> <li>Version (state the date of the last Senate approval)</li> <li>Pre-Requisite TMA1201 Discrete Structures &amp; Probability             Assc. Prof Dr. C.K.Ho             TMA1201 Discrete Structures &amp; Probability             Prof. Yashwant Prasad Singh Assc. Prof Dr. C.K.Ho             Semester and Year offered Trimester 1 (Beta Level)         </li> <li>Objective of the course/module in the programme:             This course introduces the functional programming paradigm and the implementation technology for functional programming languages. It aims to develop a broad understanding of the benefits of the functional programming style, together with an understanding of implementation issues that are relevant not only to functional languages but also to other systems that require automatic dynamic memory management.</li> <li>Subject Learning Outcomes:         <ol> <li>write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.</li> <li>understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;</li> <li>understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;</li> <li>learn how to decompose and represent programming problems, how to compose the solutions into complete programs                   learn how to reason about the programs to ensure that they are correct</li> </ol> </li> <li>Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk<th>4</th><th>Name of Course /Madule</th><th>Everational December</th><th></th></li></ul>	4	Name of Course /Madule	Everational December					
Status of Subject			Functional Programming					
MGF Level/Stage   Note:   Certificate – MGF Level 3   Diploma – MGF Level 4   Bachelor – MGF Level 6   Masters – MGF Level 6   Masters – MGF Level 7   Doctoral – MGF Level 8   Doctoral – MGF Level 9   Doctoral – MGF Level 8   Date of New Version : Year 2012 (state the date of the last Senate approval)   TMA1201 Discrete Structures & Probability   Prof. Yashwant Prasad Singh   Assc. Prof Dr. C.K.Ho   Assc. Prof Dr. C.K.Ho   Discrete of the course/module in the programme : This course introduces the functional programming paradigm and the implementation technology for functional programming languages. It aims to develop a broad understanding of the benefits of the functional programming languages to develop a broad understanding of the benefits of the functional programming tyle, together with an understanding of implementation issues that are relevant not only to functional languages but also to other systems that require automatic dynamic memory management.  11. Subject Learning Outcomes : To be able to:  • write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  • understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  • understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  • learn how to decompose and represent programming problems, how to compose the solutions into complete programs learn how to reason about the programs to ensure that they are correct  13. Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi d								
Note: Certificate – MQF Level 3 Diploma – MQF Level 4 Bachelor – MQF Level 6 Masters – MQF Level 8  5. Version (state the date of the last Senate approval)  6. Pre-Requisite TMA1201 Discrete Structures & Probability  7. Name(s) of academic/teaching staff Prof. Yashwant Prasad Singh Assc. Prof Dr. Ci.Ho  8. Semester and Year offered Trimester 1 (Beta Level)  9. Objective of the course/module in the programme: This course introduces the functional programming paradigm and the implementation technology for functional programming languages. It aims to develop a broad understanding of the benefits of the functional programming style, together with an understanding of implementation issues that are relevant not only to functional languages but also to other systems that require automatic dynamic memory management.  11. Subject Learning Outcomes:  To be able to:  • write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  • understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  • understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  • learn how to decompose and represent programming problems, how to compose the solutions into complete programs  learn how to reason about the programs to ensure that they are correct  13. Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:  Ortification  Programme Outcomes  South Programme Outcomes  Ontribution  Apply soft skills in work and								
Certificate – MGF Level 3 Diploma – MGF Level 6 Bachelor – MGF Level 6 Masters – MGF Level 7 Doctoral – MGF Level 8  5. Version (state the date of the last Senate approval) 6. Pre-Requisite TMA1201 Discrete Structures & Probability 7. Name(s) of academic/teaching staff Prof. Yashwant Prasad Singh Assc. Prof Dr. C.K.Ho 8. Semester and Year offered Trimester 1 (Beta Level) 9. Objective of the course/module in the programmic paradigm and the implementation technology for functional programming languages. It alms to develop a broad understanding of the benefits of the functional programming languages but also to other systems that require automatic dynamic memory management.  11. Subject Learning Outcomes:  To be able to:  • write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  • understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  • understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  • learn how to reason about the programs to ensure that they are correct  13. Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:  Programme Outcomes  Contribution Apply soft skills in work and career related activities	4.		Bachelor Degree – MQF Level 6					
Diploma – MQF Level 4   Bachelor – MQF Level 6   Masters – MQF Level 7   Doctoral – MQF Level 8								
Bachelor - MQF Level 6   Masters - MQF Level 8								
Masters - MQF Level 7   Doctoral - MQF Level 8								
5. Version (state the date of the last Senate approval) 6. Pre-Requisite Times (Properties of the last Senate approval) 6. Pre-Requisite Times (Properties of the last Senate approval) 6. Pre-Requisite Times (Properties of the last Senate approval) 7. Name(s) of academic/teaching staff Prof. Yashwant Prasad Singh Assc. Prof Dr. C.K.Ho 8. Semester and Year offered Trimester 1 (Beta Level) 9. Objective of the course/module in the programme: This course introduces the functional programming paradigm and the implementation technology for functional programming style, together with an understanding of implementation issues that are relevant not only to functional languages but also to other systems that require automatic dynamic memory management.  11. Subject Learning Outcomes:  To be able to:  • write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  • understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages; • understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages; • learn how to decompose and represent programming problems, how to compose the solutions into complete programs learn how to reason about the programs to ensure that they are correct  13. Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi la bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:  Programme Outcomes  5								
Section   Date of New Version : Year 2012		·						
(state the date of the last Senate approval)  6. Pre-Requisite TMA1201 Discrete Structures & Probability  7. Name(s) of academic/teaching staff Prof. Yashwant Prasad Singh Assc. Prof Dr. C.K.Ho  8. Semester and Year offered Trimester 1 (Beta Level)  9. Objective of the course/module in the programme:  This course introduces the functional programming paradigm and the implementation technology for functional programming languages. It aims to develop a broad understanding of the benefits of the functional programming style, together with an understanding of implementation issues that are relevant not only to functional languages but also to other systems that require automatic dynamic memory management.  11. Subject Learning Outcomes:  To be able to:  • write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  • understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  • understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  • learn how to decompose and represent programming problems, how to compose the solutions into complete programs  learn how to reason about the programs to ensure that they are correct  13. Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. la bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan mornri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:  Programme Outcomes  5								
6. Pre-Requisite  7. Name(s) of academic/teaching staff  8. Semester and Year offered  9. Objective of the course/module in the programme:  This course introduces the functional programming paradigm and the implementation technology for functional programming languages. It aims to develop a broad understanding of the benefits of the functional programming style, together with an understanding of implementation issues that are relevant not only to functional languages but also to other systems that require automatic dynamic memory management.  11. Subject Learning Outcomes:  To be able to:  • write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  • understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  • understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  • learn how to decompose and represent programming problems, how to compose the solutions into complete programs  learn how to reason about the programs to ensure that they are correct  13. Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. la bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:    Programme Outcomes   Contribution	5.		Date of New Version : Year 2012					
Rame(s) of academic/teaching staff								
8. Semester and Year offered   Trimester 1 (Beta Level) 9. Objective of the course/module in the programme: This course introduces the functional programming paradigm and the implementation technology for functional programming languages. It aims to develop a broad understanding of the benefits of the functional programming style, together with an understanding of implementation issues that are relevant not only to functional languages but also to other systems that require automatic dynamic memory management.  11. Subject Learning Outcomes:  To be able to:  • write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  • understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  • understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  • learn how to decompose and represent programming problems, how to compose the solutions into complete programs learn how to reason about the programs to ensure that they are correct  13. Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:  Programme Outcomes  Apply soft skills in work and career related activities  5				Probability				
Semester and Year offered	7.	Name(s) of academic/teaching staff						
9. Objective of the course/module in the programme: This course introduces the functional programming paradigm and the implementation technology for functional programming languages. It aims to develop a broad understanding of the benefits of the functional programming style, together with an understanding of implementation issues that are relevant not only to functional languages but also to other systems that require automatic dynamic memory management.  11. Subject Learning Outcomes:  To be able to:  • write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  • understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  • understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  • learn how to decompose and represent programming problems, how to compose the solutions into complete programs learn how to reason about the programs to ensure that they are correct  13. Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. la bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:  **Of** **Contribution** **Optoribution** **Optoribut								
This course introduces the functional programming paradigm and the implementation technology for functional programming languages. It aims to develop a broad understanding of the benefits of the functional programming style, together with an understanding of implementation issues that are relevant not only to functional languages but also to other systems that require automatic dynamic memory management.  11. Subject Learning Outcomes:  To be able to:  • write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  • understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  • understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  • learn how to decompose and represent programming problems, how to compose the solutions into complete programs learn how to reason about the programs to ensure that they are correct  13. Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. la bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:  **Of**  **Contribution**  **Programme Outcomes**  Apply soft skills in work and career related activities*			Trimester 1 (Beta Level)					
functional programming languages. It aims to develop a broad understanding of the benefits of the functional programming style, together with an understanding of implementation issues that are relevant not only to functional languages but also to other systems that require automatic dynamic memory management.  11. Subject Learning Outcomes:  To be able to:  • write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  • understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  • understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  • learn how to decompose and represent programming problems, how to compose the solutions into complete programs learn how to reason about the programs to ensure that they are correct  13. Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:  **Of**  **Programme Outcomes**  Contribution  Apply soft skills in work and career related activities	9.							
functional programming style, together with an understanding of implementation issues that are relevant not only to functional languages but also to other systems that require automatic dynamic memory management.  11. Subject Learning Outcomes:  To be able to:  • write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  • understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  • understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  • learn how to decompose and represent programming problems, how to compose the solutions into complete programs  learn how to reason about the programs to ensure that they are correct  13. Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:    Word   Programme Outcomes   Contribution   Apply soft skills in work and career related activities   5								
relevant not only to functional languages but also to other systems that require automatic dynamic memory management.  11. Subject Learning Outcomes:  To be able to:  • write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  • understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  • understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  • learn how to decompose and represent programming problems, how to compose the solutions into complete programs  learn how to reason about the programs to ensure that they are correct  13. Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. la bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:    Wof Programme Outcomes   Contribution   Apply soft skills in work and career related activities   5								
memory management.  Subject Learning Outcomes:  To be able to:  write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  learn how to decompose and represent programming problems, how to compose the solutions into complete programs  learn how to reason about the programs to ensure that they are correct  Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. la bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  Mapping of Subject to Programme Outcomes:  **Rogramme Outcomes**  **Rogramme Ou								
11. Subject Learning Outcomes:  To be able to:  • write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  • understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  • understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  • learn how to decompose and represent programming problems, how to compose the solutions into complete programs  learn how to reason about the programs to ensure that they are correct  13. Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. la bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:    Wof Programme Outcomes   Contribution			to other systems that require auto	matic dynamic				
To be able to:  write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.  understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  learn how to decompose and represent programming problems, how to compose the solutions into complete programs learn how to reason about the programs to ensure that they are correct  Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. la bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  Mapping of Subject to Programme Outcomes:    Mapping of Subject to Programme Outcomes   % of Contribution		memory management.						
<ul> <li>write programs in a functional style and be able to use the language to implement algorithms and data types to solve problems.</li> <li>understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;</li> <li>understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;</li> <li>learn how to decompose and represent programming problems, how to compose the solutions into complete programs</li> <li>learn how to reason about the programs to ensure that they are correct</li> <li>Synopsis:</li> <li>Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. la bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.</li> <li>Mapping of Subject to Programme Outcomes:</li> <li>"% of Contribution Apply soft skills in work and career related activities</li> </ul>	11.							
and data types to solve problems.  understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;  understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  learn how to decompose and represent programming problems, how to compose the solutions into complete programs learn how to reason about the programs to ensure that they are correct  Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. la bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  Mapping of Subject to Programme Outcomes:  Programme Outcomes  Synopsis:  **Of** Contribution**  **Of** Contribution**  **Of** Contribution**  **Deptition**  **Deptition**  **Of** Contribution**  **Deptition**  **Of** Contribution**  **Deptition**  **Of** Contribution**  **Deptition**  **Of** Contribution**  **Deptition**  **Deptition**  **Of** Contribution**  **Deptition**  **De								
<ul> <li>understand the basics of the lambda calculus and combinators and how they are used in the implementation of functional languages;</li> <li>understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;</li> <li>learn how to decompose and represent programming problems, how to compose the solutions into complete programs</li> <li>learn how to reason about the programs to ensure that they are correct</li> <li>Synopsis:</li> <li>Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.</li> <li>Mapping of Subject to Programme Outcomes:</li> <li>Mapping of Subject to Programme Outcomes</li> <li>Contribution</li> </ul>		<ul> <li>write programs in a functional style and be</li> </ul>	able to use the language to implem	nent algorithms				
implementation of functional languages;  understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  learn how to decompose and represent programming problems, how to compose the solutions into complete programs learn how to reason about the programs to ensure that they are correct  Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. la bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  Mapping of Subject to Programme Outcomes:  Programme Outcomes  Spinal languages;  With contribution of lazy functional languages;  With contribution of lazy functional languages;  With contribution of lazy functional memory management issues  affecting the computation of lazy functional memory management issues  affecting the computation of lazy functional memory management issues  affecting the computation of lazy functional memory management issues  affecting the computation of lazy functional memory management issues  affecting the computation of lazy functional memory management issues  affecting the computation of lazy functional memory management issues  affecting the sequential and perallel implementation of lazy functional memory management issues  affecting the sequential and perallel implementation of lazy functional memory management issues  affecting the sequential and perallel implementation of lazy functional languages;  affecting the sequential and perallel implementation of lazy functional languages;  affecting the sequential and perallel inspection of lazy functional languages;  affecting the sequential and perallel inspection of la		and data types to solve problems.						
understand the main features of a modern lazy functional language; write non-trivial functional programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;     learn how to decompose and represent programming problems, how to compose the solutions into complete programs     learn how to reason about the programs to ensure that they are correct    Synopsis:   Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.    Mapping of Subject to Programme Outcomes :		<ul> <li>understand the basics of the lambda calcul</li> </ul>	us and combinators and how they a	are used in the				
programs; understand the computation, synchronisation and memory management issues affecting the sequential and parallel implementation of lazy functional languages;  learn how to decompose and represent programming problems, how to compose the solutions into complete programs learn how to reason about the programs to ensure that they are correct    Synopsis:   Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.    Mapping of Subject to Programme Outcomes :		implementation of functional languages;						
affecting the sequential and parallel implementation of lazy functional languages;  • learn how to decompose and represent programming problems, how to compose the solutions into complete programs  learn how to reason about the programs to ensure that they are correct  13. Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:  Programme Outcomes  Synopsis:  Washana terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.		<ul> <li>understand the main features of a modern</li> </ul>	lazy functional language; write non-	-trivial functional				
learn how to decompose and represent programming problems, how to compose the solutions into complete programs learn how to reason about the programs to ensure that they are correct  13. Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:    Wof Programme Outcomes   % of Contribution   % of Con		programs; understand the computation, syr	nchronisation and memory manage	ment issues				
into complete programs learn how to reason about the programs to ensure that they are correct  Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  Mapping of Subject to Programme Outcomes:  Programme Outcomes  Apply soft skills in work and career related activities  5		affecting the sequential and parallel implen	nentation of lazy functional languag	es;				
into complete programs learn how to reason about the programs to ensure that they are correct  Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  Mapping of Subject to Programme Outcomes:  Programme Outcomes  Apply soft skills in work and career related activities  5								
learn how to reason about the programs to ensure that they are correct  Synopsis:  Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  Mapping of Subject to Programme Outcomes:    Wof Programme Outcomes   % of Contribution   % of Contrib			, , ,					
<ul> <li>Synopsis:         <ul> <li>Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.</li> </ul> </li> <li>Mapping of Subject to Programme Outcomes:         <ul> <li>% of Contribution</li> </ul> </li> <li>Apply soft skills in work and career related activities</li> </ul>								
Kursus ini memperkenalkan paradigma pengaturcaraan fungsi dan teknologi pelaksanaan untuk bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:    Wof Programme Outcomes   Contribution	13.		•					
bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:    Mapping of Subject to Programme Outcomes   % of Contribution		_ = Jep =						
bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:    Wof Programme Outcomes		Kursus ini memperkenalkan paradigma pengatur	caraan fungsi dan teknologi pela	aksanaan untuk				
pengaturcaraan fungsi dan juga pemahaman terhadap isu pelaksanaan yang relevan kepada bukan sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:    Work		bahasa pengaturcaraan fungsi. Ia bertujuan untuk membina kefahaman tentang kelebihan gaya						
sahaja bahasa fungsi bahkan terhadap sistem lain yang memerlukan pengurusan momri dinamik secara automatik.  16. Mapping of Subject to Programme Outcomes:    Work								
secara automatik.  16. Mapping of Subject to Programme Outcomes :								
16. Mapping of Subject to Programme Outcomes :    Was a contribution								
W of   Programme Outcomes   Contribution								
Programme Outcomes Contribution Apply soft skills in work and career related activities 5	16.							
Apply soft skills in work and career related activities 5								
To make use of fundamentals concepts and formulate best practices. 30								
		To make use of fundamentals concepts and formula	ate best practices.	30				

	Apply toobaical concept	to and practices in	anagialized areas of	Compute	r Coionas	20	
	Apply technical concepts and practices in specialized areas of Computer Science 20						
		Analyze the requirements to address problems or opportunities faced by 30					
	organizations						
	Recognize and pursue			neir care	eer	5	
	Blend innovative mind a					5	
	Relate moral values and		s to the practice of a	n ICT pr	otessional.	5	
18.	Assessment Methods a	nd Types:					
			Descrip	tion/Deta	ails		
	Method and	I Туре				Percentage	
	Coursework:						
	Midterm test					30%	
	Quizzes and Assignment	nt				30%	
	Final Exams					40%	
19.							
	Details of Subject						
		Topics			Mode o	f Delivery	
		1 opics			Lecture	Tutorial/Lab	
	Introduction						
	Classification	of Progran	nming Lang	juages;	4	4	
	Distinctive Features of I	Functional Program	ming Languages;	_			
	Principles of function	al programming:	expressions, evalu	ıations,			
	functions, and types						
	The Lambda Calculus		4	4			
	Reduction or	ders, stro	ong norma	lisation			
	Combinators - computa		ets				
	A Modern Functional				6	6	
	Programming Environm						
	Programming						
	tuples and lists						
	Recursion						
	Pattern-Matching						
	Higher-Order			nctions			
		ypes and	type o	classes			
	Recursive Programming	g Lechniques					
	Data structures				6	6	
	Binary trees, general t						
		olic data. Normal order reduction and lazy evaluation. Simple					
	cost models for function		and space complexity	у.			
	Monad and Interaction 4 4				4		
	Parsing Expression	and of the					
	Parsing Expression Mo						
		Arithmetic expression parser			A	<u> </u>	
	Programming GUIs	15			4	4	
23.	Total				28	28	
23.	Lab / Tutorial :						
25	Total Ctudant	Faac 4	o Food				
25.	Total Student		o Face	Total G	uided and Indep	endent Learning	
	Learning Time (SLT)	,	our)		· · · · · · · · · · · · · · · · · · ·		
	Lectures		8		28		
	Lab		8		28		
	Midterm test (1)	1		6			
	Assignment (1)	0		12			
	Quizzes	1 2			6		
	Lab test (1)				8		
	Final exam (1)		2		20		
	,						

	SUBTOTAL	60		100	
	Total SLT	160/40 = 4			
26.	Credit Value			4	
27.	Reading Materials :				
	Textbook				
		ce-Hall International, 1998. than Thompson and best a good background in g, Second Edition.  Skell: The Craft of ag, Second Edition.  Skell: The Craft of Expression, Cambridge University Press, 2007  2. Simon Thompson, Haskell: The Craft Functional Programming, Addison-wesley, Second Edition, 1999.  3. Paul Hudak, The Haskell School of Expression, Cambridge University Press, 2007  Simon Thompson, Haskell: The Craft Functional Programming, Addison-wesley, Second Edition, 1999.  3. Paul Hudak, The Haskell School of Expression, Cambridge University Press, 2007  Simon Thompson, Haskell: The Craft Functional Programming, Addison-wesley, Second Edition, 1999.  3. Paul Hudak, The Haskell School of Expression, Cambridge University Press, 2007  Simon Thompson, Haskell: The Craft Functional Programming, Addison-wesley, Second Edition, 1999.  3. Paul Hudak, The Haskell School of Expression, Cambridge University Press, 2007  Simon Thompson, Haskell: The Craft Functional Programming, Addison-wesley, Second Edition, 1999.  3. Paul Hudak, The Haskell School of Expression, Cambridge University Press, 2007  Simon Thompson, Haskell: The Craft Functional Programming, Addison-wesley, Second Edition, 1999.  3. Paul Hudak, The Haskell School of Expression, Cambridge University Press, 2000.  4. "The Fun of Programming Male Pression Programming Mal		Simon Thompson, Haskell: The Craft of Functional Programming, Addison-Wesley, Second Edition, 1999. Paul Hudak, The Haskell School of Expression, Cambridge University Press, 2000. "The Fun of Programming" edited by Jeremy Gibbons and Oege de Moor ("The Fun"). George Springer and Daniel P. Friedman, "Scheme and the Art of Programming", MIT Press, 1989. Daniel P. Friedman and Matthias Felleisen, "The Little Schemer", The MIT	
30.	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)				