
Master of Science Teaching of Mathematics

Academic Session 2020/2021



School of Mathematical Sciences

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**ACADEMIC CALENDAR
ACADEMIC SESSION 2020/2021
UNIVERSITI SAINS MALAYSIA**

SEM	WEEK	ACTIVITY	DATE			REMARKS
ONE	1	Teaching & Learning (T&L - 7 Weeks)	Monday,	12.10.2020 - Sunday,	18.10.2020	
	2		Monday,	19.10.2020 - Sunday,	25.10.2020	
	3		Monday,	26.10.2020 - Sunday,	01.11.2020	29.10.2020, Thursday - Prophet Muhammad's Birthday
	4		Monday,	02.11.2020 - Sunday,	08.11.2020	
	5		Monday,	09.11.2020 - Sunday,	15.11.2020	11 & 12.11.2020, Wednesday & Thursday - Sultan of Kelantan's Birthday (Kelantan) 14.11.2020, Saturday - Deepavali**
	6		Monday,	16.11.2020 - Sunday,	22.11.2020	
	7		Monday,	23.11.2020 - Sunday,	29.11.2020	
	8	Mid Semester Break	Monday,	30.11.2020 - Sunday,	06.12.2020	
	9	Teaching & Learning (T&L - 7 Weeks)	Monday,	07.12.2020 - Sunday,	13.12.2020	
	10		Monday,	14.12.2020 - Sunday,	20.12.2020	
	11		Monday,	21.12.2020 - Sunday,	27.12.2020	25.12.2020, Friday - Christmas
	12		Monday,	28.12.2020 - Sunday,	03.01.2021	01.01.2021, Friday - New Year of 2021
	13		Monday,	04.01.2021 - Sunday,	10.01.2021	
	14		Monday,	11.01.2021 - Sunday,	17.01.2021	
	15		Monday,	18.01.2021 - Sunday,	24.01.2021	
	16	Revision Week	Monday,	25.01.2021 - Sunday,	31.01.2021	28.01.2021, Thursday - Thaipusam**
	17	Examination (3 Weeks)	Monday,	01.02.2021 - Sunday,	07.02.2021	
	18		Monday,	08.02.2021 - Sunday,	14.02.2021	12 & 13.02.2021, Friday & Saturday - Chinese New Year**
	19		Monday,	15.02.2021 - Sunday,	21.02.2021	
	20	Mid Semester Break / Industrial Training (4 Weeks)	Monday,	22.02.2021 - Sunday,	28.02.2021	22.02.2021, Monday - 14.03.2021, Sunday - PPJJ Intensive Course
	21		Monday,	01.03.2021 - Sunday,	07.03.2021	
	22		Monday,	08.03.2021 - Sunday,	14.03.2021	
	23		Monday,	15.03.2021 - Sunday,	21.03.2021	
TWO	24/1	Teaching & Learning (T&L - 7 Weeks)	Monday,	22.03.2021 - Sunday,	28.03.2021	
	25/2		Monday,	29.03.2021 - Sunday,	04.04.2021	
	26/3		Monday,	05.04.2021 - Sunday,	11.04.2021	
	27/4		Monday,	12.04.2021 - Sunday,	18.04.2021	13.04.2021, Tuesday - Awal Ramadhan (Kelantan)
	28/5		Monday,	19.04.2021 - Sunday,	25.04.2021	
	29/6		Monday,	26.04.2021 - Sunday,	02.05.2021	29.04.2021, Thursday - Nuzul Al-Quran 01.05.2021, Saturday - Labour Day
	30/7		Monday,	03.05.2021 - Sunday,	09.05.2021	
	31/8	Mid Semester Break	Monday,	10.05.2021 - Sunday,	16.05.2021	13 & 14.05.2021, Thursday & Friday - Eid-ul fitr**
	32/9	Teaching & Learning (T&L - 7 Weeks)	Monday,	17.05.2021 - Sunday,	23.05.2021	
	33/10		Monday,	24.05.2021 - Sunday,	30.05.2021	26.05.2021, Wednesday - Wesak Day 30.05.2021, Sunday - Pesta Kaamatan (Sabah)
	34/11		Monday,	31.05.2021 - Sunday,	06.06.2021	31.05.2021, Monday - Pesta Kaamatan (Sabah) 01 & 02.06.2021, Tuesday & Wednesday - Hari Gawai (Sarawak)
	35/12		Monday,	07.06.2021 - Sunday,	13.06.2021	08.06.2021, Tuesday - Agong's Birthday
	36/13		Monday,	14.06.2021 - Sunday,	20.06.2021	
	37/14		Monday,	21.06.2021 - Sunday,	27.06.2021	
	38/15		Monday,	28.06.2021 - Sunday,	04.07.2021	

	39/16	Revision Week	Monday,	05.07.2021 - Sunday,	11.07.2021	07.07.2021, Wednesday - Penang Heritage 10.07.2021, Saturday - Penang Governor's Day		
	40/17	***Examination (2 Weeks)	Examination (3 Weeks)	Monday,	12.07.2021 - Sunday,	18.07.2021		
	41/18			Monday,	19.07.2021 - Sunday,	25.07.2021	20.07.2021, Tuesday - Eid-ul adha** 21.07.2021, Wednesday - Eid-ul adha** (Kelantan)	
	42/19	Long Vacation / Industrial Training (10/11 Weeks)	Examination (3 Weeks)	Monday,	26.07.2021 - Sunday,	01.08.2021	***2 weeks examination for engineering students undergoing Industrial Training	
*KSCP / LONG VACATION	43/20			Monday,	02.08.2021 - Sunday,	08.08.2021		
	44/21			Monday,	09.08.2021 - Sunday,	15.08.2021	10.08.2021, Tuesday - Awal Muharram	
	45/22			Monday,	16.08.2021 - Sunday,	22.08.2021		
	46/23			Monday,	23.08.2021 - Sunday,	29.08.2021		
	47/24			*T&L	Monday,	30.08.2021 - Sunday,	05.09.2021	31.08.2021, Tuesday - National Day
	48/25				Monday,	06.09.2021 - Sunday,	12.09.2021	*Courses During Long Vacation
	49/26			Examination	Monday,	13.09.2021 - Sunday,	19.09.2021	
	50/27				Monday,	20.09.2021 - Sunday,	26.09.2021	
	51/28				Monday,	27.09.2021 - Sunday,	03.10.2021	
	52/29				Monday,	04.10.2021 - Sunday,	10.10.2021	

**IMPORTANT DATES FOR FULL TIME CANDIDATES
MGM 599/8 PROJECT COURSE
ACADEMIC SESSION 2020/2021**

Candidates submit the Confirmation Form signed by the supervisor to the General Office, School of Mathematical Sciences by **18th December 2020**



Candidates register 2nd Semester courses, Academic Session **2020/2021**
*** Candidates are required to have accumulated 12 units**



Deadline for candidates to submit 4 copies (soft cover) for examination **on or before 43rd week** of Academic Calendar Academic Session **2020/2021**



Seminar & viva voce will be held **on 45th – 47th week** of Academic Calendar Academic Session **2020/2021**

**IMPORTANT DATES FOR PART TIME CANDIDATES
MGM 599/8 PROJECT COURSE
(for 2020/2021 intake)**

ACADEMIC SESSION 2020/2021

Candidates submit the Confirmation Form signed by the supervisor to the General Office, School of Mathematical Sciences by **16th July 2021**



Candidates register 1st Semester courses, Academic Session **2021/2022**
*** Candidates are required to have accumulated 12 units**



Deadline for candidates to submit 4 copies (soft cover) for examination on or before **43rd week** of Academic Calendar Academic Session **2021/2022**



Seminar & viva voce will be held **on 45th – 47th week** of Academic Calendar – Academic Session **2021/2022**

Submission date of supervisor confirmation form for part-time students for intake Academic Session **2020/2021** is by **16th July 2021**.

MASTER OF SCIENCE (TEACHING OF MATHEMATICS)

A. OBJECTIVES

The objectives of the program are to increase teachers' expertise in teaching mathematics courses at pre-university level and to nurture research activities among teachers.

B. PROGRAM STRUCTURE

Candidates have to complete at least 43 units of the required coursework consisting of 32 units of compulsory courses (including 8 units Project) and 11 or 12 units of elective courses by obtaining at least a B grade for each course taken and achieving a CGPA of at least 3.0. Candidates are also required to participate in seminars organized by the School of Mathematical Sciences from time to time.

The program is offered either on a full time or part time basis. The minimum period for full time candidates is 3 semesters (18 months) and a maximum period of 4 semesters (24 months). For part time candidates, the minimum period is 5 semesters (30 months) and a maximum period of 8 semesters (48 months).

C. COURSES

Compulsory (32 units):

MGM 502/4	:	Number Theory (<i>Teori Nombor</i>)
MGM 511/4	:	Linear Algebra (<i>Aljabar Linear</i>)
MGM 531/4	:	Euclidean Geometry (<i>Geometri Euclidean</i>)
MGM 551/4	:	Operations Research (<i>Penyelidikan Operasi</i>)
MGM 561/4	:	Statistical Methods for Research (<i>Kaedah Statistik untuk Penyelidikan</i>)
MGM 562/4	:	Probability Theory (<i>Teori Kebarangkalian</i>)
MGM 599/8	:	Project (<i>Projek</i>)

Electives (11 or 12 units, choose 3 courses):

MGM 501/4	:	Analysis (<i>Analisis</i>)
MGM 503/4	:	Combinatorics (<i>Kombinatorik</i>)
MGM 563/4	:	Statistical Inference (<i>Pentaabiran Statistik</i>)
MGM 581/4	:	Mathematics and Technology (<i>Matematik dan Teknologi</i>)
PMC 561/3	:	Theories of Teaching and Learning Mathematics (<i>Teori Pengajaran dan Pembelajaran dalam Matematik</i>)

Note:

- Groups of 2 compulsory courses (with the exception of MGM 599/8) are offered two years in a row in different semesters and then skipped in the third year.
- Elective courses (with the exception of PMC 561/3) are offered in the same semester in alternate years.

(Please refer to the following Table of Course Offering in planning your courses).

**TABLE OF COURSE OFFERING
(Commencing on 2020/2021 Academic Session)**

SEMESTER 1		SEMESTER 2	
Compulsory	Elective	Compulsory	Elective
MGM 502/4	MGM 503/4	MGM 511/4	MGM 501/4
MGM 561/4	PMC 561/3	MGM 562/4	
MGM 599/8		MGM 599/8	
Compulsory	Elective	Compulsory	Elective
MGM 531/4	MGM 581/4	MGM 502/4	MGM 563/4
MGM 551/4	PMC 561/3	MGM 561/4	
MGM 599/8		MGM 599/8	
Compulsory	Elective	Compulsory	Elective
MGM 511/4	MGM 503/4	MGM 531/4	MGM 501/4
MGM 562/4	PMC 561/3	MGM 551/4	
MGM 599/8		MGM 599/8	
Compulsory	Elective	Compulsory	Elective
MGM 502/4	MGM 581/4	MGM 511/4	MGM 563/4
MGM 561/4	PMC 561/3	MGM 562/4	
MGM 599/8		MGM 599/8	
Compulsory	Elective	Compulsory	Elective
MGM531/4	MGM503/4	MGM502/4	MGM501/4
MGM551/4	PMC561/3	MGM561/4	
MGM599/8		MGM599/8	

NOTE: Apart from MGM 599/8, part-time candidates are advised to take 1 compulsory and 1 elective courses in each semester. Apart from MGM 599/8 and PMC561/3, full-time candidates are advised to take all courses being offered in each semester. Candidates must register at least 1 course every semester to maintain his/her candidacy. Candidates must request for a postponement if he/she could not register for any course in a particular semester. Candidates are advised not to take more than 16 units of courses in any semester.

REGISTERING FOR PROJECT (MGM 599/8)

Part-time students who begin the M.Sc. Teaching Mathematics program in the 1st semester will normally register for MGM 599/8 in their 2nd academic year after they have accumulated 12 units, whereas those who begin the program in the 2nd semester may/may not be able to register for MGM 599/8 in the following academic year (since part-time students are advised to take only 8 units of courses per semester). Full-time students who begin the M.Sc. Teaching Mathematics program in the 1st semester can choose to register for MGM 599/8 in the 2nd Semester of their 1st academic year to achieve a minimum period of candidature; however, this requires them to obtain a supervisor during their 1st semester in the program. Full-time students who begin the M.Sc. Teaching Mathematics program in the 2nd Semester shall register for MGM 599/8 in the following academic year and they can choose either to register in the 1st Semester or 2nd Semester. Please refer to the synopsis of the course.

SYNOPSIS OF COMPULSORY COURSES

1.0 MGM 502/4 Number Theory (*Teori Nombor*)

Peano's Axiom and the principle of mathematical induction.
Divisibility of integers and their representation as a product of primes.
Arithmetic Modulo: Chinese remainder theorem.
Arithmetic Functions.
Quadratic residue

Use of number theory in cryptography. The RSA cryptography system. Using quadratic residue to construct a cryptography system.

References

1. Strayer, J. K. (2001). *Elementary Number Theory*, Waveland Press Inc.
2. Adler, A. & Coury J. E. (1995). *Theory of Numbers: A Text and Source Book of Problems*, Jones and Bartlett Publishers.
3. Schroeder, M. R. (1985). *Number Theory in Science and Communication*, Springer-Verlag.

2.0 MGM 511/4 Linear Algebra (*Aljabar Linear*)

Linear transformation on a finite dimensional space, and the matrix representation of a linear transformation.

Use of linear transformation in solving several geometrical problems like rotation and reflection.

The inner product operation, and the use of this operation in curve fitting through least square method.

Use of linear algebra in coding theory.

References

1. Pretzel, O. (1992). *Error Correcting Codes and Finite Fields*. Clarendon Press, Oxford.
2. Leon S. J. (1986). *Linear Algebra with Applications*, Macmillan Publishing Company.
3. Shu Lin & Costello, D. J. Jr. (2004). *Error Control Coding: Fundamentals and Applications*. Prentice Hall, Indiana, U.S.A.

3.0 MGM 531/4 Euclidean Geometry (*Geometri Euclidean*)

A detailed discussion of Euclid's Axioms, and their applications in determining geometrical properties such as parallel lines, congruent triangles, similar triangles and circles.

Expanding the Euclidean space to projective geometric space. Explaining several daily phenomenon using projective geometry.

Introduction to non-Euclidean geometry.

References

1. Coexter, H. S. M. (1969). *Introduction to Geometry*, 2nd Edition, John Wiley & Sons, New York.
2. Schreider, O. & Sperner E. (1985). *Projective Geometry of n-dimensions*, Chelsea Publishing Company.
3. Bouswma, W. D. (1972). *Geometry for Teachers*, Macmillan Company.
4. Seidenberg, A. (1962). *Lectures on Projective Geometry*. Van Nostrand Company Inc.
5. Ballico, E. (1994). *Projective Geometry with Applications*, Marcel-Dekker.
6. Coxeter, H. S. M. & Greitzer, S. L. (1967), *Geometry Revisited*, Washington D.C.: Mathematical Association of America.
7. Pedoe, D. (1970), *A Course of Geometry for Colleges and Universities*, Cambridge University Press.

4.0 MGM 551/4 Operations Research (*Penyelidikan Operasi*)

Linear Programming (LP): LP Model formulation, Graphical solution and its sensitivity analysis, Standard LP model, Simplex method, Artificial variables techniques, Special cases, sensitivity analysis of optimal tableau, Dual problem.

Game Theory: Matrix Games, Mixed Strategy, Basic Theorems of Game Theory, $k \times 1$ Game solution, Matrix Games as a Linear Programming.

Project Management – Critical Path Analysis (PERT/CPM): Building the Arrow Diagram, Critical Path Analysis, Floats, Probabilistic Methods.

Graph Theory and Networks: Definitions and examples, Euler Graphs, Hamiltonian Graph, Chinese Postman Problem, Traveling Salesman Problem.

References

1. Taha, H. A. (2007). *Operations Research: An Introduction* (8th Ed.), Prentice-Hall.
2. Haji Ismail Mohd. (1991). *Teori dan Penggunaan Pengaturcaraan Linear*, DBP.
3. Muhamad Jantan (1987). *Pengantar Penyelidikan Operasi*, Penerbit USM.
4. Bunday, Brian D (1994). *Asas Pengaturcaraan Linear*, Interpreter : Zuhaimy Hj. Ismail, Unit Penerbitan Akademik UTM.
5. Wilson, R. J. (1991). *Pengenalan Teori Graf*, Interpreter : Faridah Maarof, Mohd. Yunus Majid dan Habibollah Haron, Unit Penerbitan Akademik UTM.
6. Fryer, M. J. (1978). *An Introduction to Linear Programming and Matrix Game Theory*, Edward Arnold, London.

**5.0 MGM 561/4 Statistical Methods for Research
(Kaedah Statistik untuk Penyelidikan)**

Descriptive Statistics

Data Presentation : Graphical Methods

Data Presentation : Measure of Central Tendency

Data Presentation : Measure of Variability/Dispersion

Empirical Rule

Chebychev's Rule

Probability : Sets and Events, Probability Laws, Probability distribution

Random variables and Probability Distribution : One and Two Variables

Discrete Probability Distributions

Continuous Probability Distributions

Sampling Distributions : Sampling Distributions for Mean and Proportion, Central Limit Theorem

Estimation : Point Estimation, Interval Estimation

Hypothesis Testing

Hypothesis Test : The Null and the Alternative Hypotheses, Significance Level, Rejection Region.

Test Statistics, Decision Error

Hypothesis testing for Population Mean

Hypothesis testing for Population Proportion

Chi-Square Fit Test, Goodness-of-fit Test, Contingency Tables, Tests for Independence and Homogeneity

Inferences About Population Variances

One Way Analysis of Variances (ANOVA)

Simple Linear Regression, Prediction and Linear Correlation

Time Series Analysis, Index Numbers

Introduction to Research Methodological

Applications to the Field of Education

References

1. Ott, L., (1993). *An Introduction to Statistical Methods and Data Analysis*, Duxbury Press.
2. Bhattacharayya & Johnson (1977). *Statistical Concepts and Methods*, John Wiley & Sons.
3. Chatfield, C. (1984). *The Analysis of Time Series: An Introduction*, Chapman & Hall, 3rd Ed.
4. Aggarwal, Y. P. (1990). *Statistical Methods : Concepts, application and computations*, Sterling Publishers.
5. Alias Baba (1997). *Statistik Penyelidikan Dalam Pendidikan dan Sains Sosial*, Bangi: Penerbit UKM.

6.0 MGM 562/4 Probability Theory (Teori Kebarangkalian)

Counting Techniques : permutation and combination

Basic Probability Concepts : sample space and events, set definition, intersection, union, complement, axioms of probability, Venn diagram, Tree diagram, mutually exclusive events and independent events

Dependent Events : Conditional probability, Bayes' Theorem

Random Variables : discrete and continuous variables, probability density function, cumulative distribution function

Expectation and Distribution : expected values, variance and standard deviation, moment generating function, probability generating function, Chebyshev's inequality

Discrete Distributions : Bernoulli, Binomial, Poisson, Hypergeometric and Negative Binomial

Continuous Distributions : Uniform, Normal, Exponential, Chi-squared, Gamma, Beta, t and F distributions

Bivariate Variables : joint density function, joint cumulative function, marginal density function, conditional density, conditional expectation

Probability Theory in Decision Analysis

References

1. Ross, S. M. (2000). *Introduction to Probability Models* (7th edition), Academic Press.
2. Hogg, R. V. & Craig, A.T. (1978). *Introduction to Mathematical Statistics* (3rd. Edition), New York: Macmillan.
3. Mood, A. M., Graybill, F.A. & Boes, D. C. (1974). *Introduction to the Theory of Statistics* (3rd. Edition). New York: McGraw-Hill.
4. Khatijah Syed Ahmad (1996). *Pengantar Teori Statistik, USM*.

7.0 MGM 599/8 Project (Projek)

In general, students must have obtained at least 12 units before they can register for this course. The course is offered both in the 1st and 2nd Semesters of an academic year. However, PART-TIME students are only allowed to register the course in the 1st semester whereas FULL-TIME students are allowed to register for the course in the 1st or 2nd Semester. The duration of the course is 2 SEMESTERS FOR PART-TIME students and 1 SEMESTER FOR FULL-TIME students.

PART-TIME STUDENTS

Students must:

1. Fill-up and submit the Project Supervisor Confirmation Form (refer to Appendix A) not later than the 1st week of 2nd semester's Final Exam.
2. Register the course in the 1st semester of the following Academic Year (students will obtain an incomplete grade).
3. Submit a report in May/June towards the end of 2nd Semester (of the same academic year) and complete the seminar + *viva voce* requirement (please refer to the main office for exact dates).
4. Grade will be announced after KSCP ("*Kursus Semasa Cuti Panjang*").

FULL-TIME STUDENTS (Registering MGM599/8 in 1st Semester)

1. Fill-up and submit the Project Supervisor Confirmation Form (refer to Appendix A) not later than the 1st week of 2nd Semester's Final Exam.
2. Register the course in the 1st Semester of the following Academic Year.
3. Submit the report and complete the seminar + *viva voce* requirement before the end of the same semester (please refer to the office for the exact dates).
4. Grade will be announced concurrent with the 1st Semester's course results.

FULL-TIME STUDENTS (Registering MGM599/8 in 2nd Semester)

1. Fill up and submit the Project Supervisor Confirmation Form (refer to Appendix A) not later than Week 10 of the 1st Semester.
2. Register the course in the 2nd Semester of the same Academic Year.
3. Submit a report in May/June towards the end of 2nd Semester and complete the seminar + *viva voce* requirement (please refer to the main office for exact dates).
4. Grade will be announced after KSCP ("*Kursus Semasa Cuti Panjang*").

Students who have registered this Project course in any of the academic sessions are required to submit their project report (after confirmation by their respective supervisors) not later than **a date in July that is to be determined**. Please note that starting from 2019/2020 academic session, students are required to submit a research paper from a compilation of their research to be appended in their report. The template for the research paper will be provided via the School's website. The submitted dissertation will be assessed by a committee of examiners and, within 1 – 2 weeks after this date, there will be a seminar presentation (30 mins) and finally the viva. The viva will begin with a short oral presentation by the student regarding his/her achievements followed by a question and answer session.

Full details of MGM 599/8 guidelines are available via <https://math.usm.my>. All academic staff in the School of Mathematical Sciences can be appointed as a Project Supervisor for MGM 599/8 Project Course.

SYNOPSIS OF ELECTIVE COURSES

1.0 MGM 501/4 Analysis (*Analisis*)

Introduction: the set of natural numbers, the set of rational numbers, the set of real numbers, the completeness axiom.

Sequences: limits of sequences, monotone sequences, Cauchy sequences, subsequences, Bolzano-Weirstrass theorem.

Continuity: continuous functions, uniform continuity, limits of functions.

Differentiation: basic properties of a derivative, the Mean Value Theorem, L' Hospital Rule, Taylor Theorem.

Integration: the Riemann Integral, Fundamental Theorem of Calculus, Improper Integral.

References

1. Marsden, J.E (1974). *Elementary Classical Analysis*, W.H. Freeman and Co.
2. Ross, K.A. (1991). *Elementary Analysis : The Theory of Calculus*, Springer-Verlag.
3. Rosihan M. Ali & Ong Boon Hua (1999). *Pengantar Analisis*, Penerbit USM.

2.0 MGM 503/4 Combinatorics (*Kombinatorik*)

This course will discuss topics in discrete mathematics such as :

Permutations and Combinatorics
Distributions and Combinatorics
Combinatorics on a chessboard
Recurrence Relations
Generating Functions
Combinatorics and Series

References

1. Dogart, K. P. (1988). *Discrete Mathematics*, D. C. Heath & Co., Lexington.
2. Dossey, J. A. (1987). *Discrete Mathematics*, Scott Foresman & Co., Glenville, ILL.
3. Ya Vilenking, N. (1971). *Combinatorics*, Academic Press.
4. Grimaldi, R. P (1994). *Discrete and Combinatorial Mathematics: An Applied Introduction*, Addison-Wesley.
5. Johnsonbaugh, R. (1996). *Discrete Mathematics*, Prentice-Hall.

3.0 MGM 563/4 Statistical Inference (*Pentaabiran Statistik*)

Statistical Distributions : Bernoulli, Binomial, Multinomial, Poisson, Exponential, Gamma, Chi-Square, Normal and Bivariate Normal Distributions.

Transformations of variables : Jacobian of the transformation. Derivation of the t distribution and F distribution.

Sampling Distributions : Sampling from the normal distribution. Order Statistics. Marginal distributions and Joint distributions of order statistics. Distributions of functions of order statistics. Convergence in probability. Convergence in distribution. Limiting distributions. Limiting moment generation function.

Point Estimation : Methods of finding point estimators. Properties of an estimator such as unbiasedness, efficiency, consistency, completeness and sufficiency. Rao-Blackwell's Theorem. Complete family of density functions, exponential family of density functions. Lehmann-Scheffe's Theorem. Locations invariance and scale invariance.

Interval Estimation : Confidence interval. Methods of constructing confidence intervals : pivotal quantity method, statistical method. Confidence interval for large sample.

Hypothesis Testing : Simple hypothesis. Composite hypothesis. Power function. Most powerful test. Uniformly most powerful test. Likelihood ratio test.

Bayes approach.

References

1. Hogg R. V. & Craig A. T. (1978). *Introduction to Mathematical Statistics* (4th Edition), Macmillan.
2. Ahmad K. S. (1996). *Pengantar Teori Statistik*, Penerbit USM.
3. Lehmann E. L. (1986). *Testing Statistical Hypotheses* (2nd Edition), New York: Wiley.
4. Mood A. M., Graybill F. A. & Boes D. C. (1974). *Introduction to the Theory of Statistics* (3rd Edition), New York : McGraw-Hill.
5. Rohatgi, V. K. (1976). *An Introduction to Probability Theory and Mathematical Statistics*, New York: Wiley.

4.0 MGM 581/4 Mathematics and Technology (*Matematik dan Teknologi*)

Technology in mathematics

- History and current situation.

Mathematics softwares

- Strengths and weaknesses. Effective use of softwares in technology.

Graphing Calculator

- Introduction and fundamental operations.

Computer Algebra Systems

- Explore and investigate topics in calculus and differential equations using graphing calculators.
- Application of certain topics to real world problems in promoting mathematical understanding.

Students version of mathematics softwares

- Fundamental operations.
- The use of mathematics softwares as an aid to solve and explore a variety of mathematical problems and applications.

Visualization in Mathematics

- Usage of softwares to display mathematical concepts.

Internet 1

- Browser, searching of research and teaching materials, ps file, pdf.zip.

Internet II

- HTML and Java Script programming.

References

1. Zainuddin Z. (2005). *Exploring topics in calculus and differential equations using the TI-92 Plus graphing calculator*- Compilation of notes.
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5.0 PMC 561/3 Theories of Teaching and Learning Mathematics

This course aims to equip students with the contemporary research studies related to the theories of teaching and learning mathematics. The course discussion will focus on the development of mathematics learning theories, as well as the implications of these theories on the teaching and learning of mathematics in schools. The course syllabus includes: Cognitive theories in the mathematics learning such as Behaviorism, Constructivism, Radical Constructivism, social constructivism including the works of Dienes, Bruner, Piaget, Skemp, von Glasserfield and Vygotsky; Information processing theory; Representation and Visualization in mathematics; and van Hiele theory. Implications of learning theories toward the teaching of mathematics in schools, and research in mathematics education will also be discussed.

References:

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Journals

1. Journal for Research in Mathematics Education, NCTM, U.S.A.
2. Journal of Science and Mathematics Education in Southeast Asia, RECSAM, Penang.
3. Mathematics Teaching, Association of Teachers of Mathematics (ATM), England.
4. The Mathematics Teachers, NCTM, U.S.A.
5. Educational Studies in Mathematics.
6. For the Learning of Mathematics.

LIST OF PROJECT SUPERVISORS (MGM 599/8)

NO.	PROFESSORS	AREAS OF RESEARCH	ROOM NO./ E-MAIL/ EXT.
1.	HAILIZA KAMARULHAILI B.Sc. (USM) M.Sc., Ph.D. (LIVERPOOL)	Analytical Number Theory, Cryptography	Room No.: 040 hailiza@usm.my Ext. No.: 3648
2.	MICHAEL KHOO BOON CHONG B.App.Sc., Ph.D. (USM)	Statistical Process Control, Statistical Inference	Room No.: 120 mkbc@usm.my Ext. No.: 3941

NO.	ASSOCIATE PROFESSORS	AREAS OF RESEARCH	ROOM NO./ E-MAIL/ EXT.
1.	ANDREW RAJAH A/L BALASINGAM GNANARAJ B.Sc., Ph.D. (USM)	Algebra, Groups and Moufang Loops	Room No.: 124 andy@usm.my Ext. No.: 4780
2.	ANG MIIN HUEY B.A., M.Sc. (USM) Ph.D. (NUS)	Coding Theory, Cryptography, Algebra	Room No.: 036 mathamh@usm.my Ext. No.: 4772
3.	FARAH AINI ABDULLAH B.Sc., M.Sc. (USM) Ph.D. (UNIVERSITY OF QUEENSLAND)	Mathematical Computing, Biomathematics	Room No.: 024 farahaini@usm.my Ext. No.: 4765
4.	LEE SEE KEONG B.Sc., M.Sc. (USM) Ph.D. (LSU)	Stochastic Analysis	Room No.: 111 sklee@usm.my Ext. No.: 2070
5.	MOHD. TAHIR ISMAIL B.App.Sc., M.Sc. (USM) Ph.D. (UKM)	Financial Time Series	Room No.: 131 m.tahir@usm.my Ext. No.: 2071
6.	NOOR ATINAH AHMAD B.Sc. (BRISTOL) Ph.D. (SOUTHAMPTON)	Phase Transition, DSP, Mathematical Modelling	Room No.: 027 nooratinah@usm.my Ext. No.: 4767
7.	SARATHA A/P SATHASIVAM B.Sc. Ed, M.Sc. (USM) Ph.D. (UM)	Neural Networks, Computational Logic, Data Mining	Room No.: 033 saratha@usm.my Ext. No.: 2428
8.	SEK SIOK KUN B.Econ., M.Sc. (UKM) Ph.D. (UNIVERSITY OF KIEL)	Econometrics	Room No.: 05 (L10) sksek@usm.my Ext. No.: 5338
9.	TEH SU YEAN B.Sc., M.Sc., Ph.D. (USM)	Environmental and Ecosystem Modelling, Mathematical Modelling	Room No.: 031 syteh@usm.my Ext. No.: 4770

10.	HUSNA HASAN B.Sc. (IOWA) M.Sc. (W. MICHIGAN) Ph.D. (USM)	Branching Process, Applied Statistics	Room No.: 026 husnahasan@usm.my Ext. No.: 3969
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NO.	SENIOR LECTURERS	AREAS OF RESEARCH	ROOM NO./ E-MAIL/ EXT.
1.	AHMAD LUTFI AMRI RAMLI B.Sc. (USM) M.Sc. (BRUNEL UNIVERSITY) Ph.D. (DURHAM)	Computer Aided Geometric Design	Room No.: 022 alaramli@usm.my Ext. No.: 2065
2.	AMIRAH AZMI B.Sc., M.Sc. (UTM) Ph.D. (UNIVERSITY OF WOLLONGONG)	Solitary Waves, Optical Soliton, Nonlinear PDE	Room No.: 114 amirahazmi@usm.my Ext. No.: 2671
3.	AZHANA AHMAD B.Sc. (USM), M.Sc. (UKM) Ph.D. (UTM)	Group Theory	Room No.: 035 azhana@usm.my Ext. No.: 4771
4.	CHONG ZHI LIN Ph.D. (USM)	Statistical Process Control	Room No.: 121 chongzl@usm.my Ext. No.: 4764
5.	FAM PEI SHAN B.Sc., M.Sc. (USM) Ph.D. (UM)	Categorical Data Analysis	Room No.: 136 fpeishan@usm.my Ext. No.: 5908
6.	HAJAR SULAIMAN B.Sc. (BISHOP'S) M.Sc., Ph.D. (UMIST)	Algebra, Group Theory	Room No.: 122 hajars@usm.my Ext. No.: 4779
7.	JOHNNY LIK KHAI YANG Ph.D. (UoA), AU	K-theory, Index Theory	Room No.: L10, Room 5 Johnny.lim@usm.my Ext. No.: 5285
8.	KONG VOON PANG B.Sc., M.Sc., Ph.D. (USM)	Computer Aided Geometric Design	Room No.: 125 kongvp@usm.my Ext. No.: 3943
9.	MAISARAH HAJI MOHD B.Sc., M.Sc. (USM) Ph.D. (UKM)	Complex Analysis, Geometric Function Theory	Room No.: 110 maisarah_hjmohd@usm.my Ext. No.: 4488
10.	MAJID KHAN BIN MAJAHAR ALI B. Sc., Ph.D (UMS)	Game Theory, Agricultural Statistical Modelling and Solar Drying System	Room No.: 130 majidkhanmajaharali@usm.my Ext. No.: 4782

Teaching of Mathematics

11.	MD YUSHALIFY BIN MISRO B. Sc., M.Sc., Ph.D (USM)	Computer Aided Geometric Design	Room No. : 034 yushalify@usm.my Ext. No. : 3658
12.	MOHD HAFIZ MOHD B.Sc. (IMPERIAL COLLEGE LONDON, ARCS) M.Sc. (USM) Ph.D. (CANTERBURY NZ)	Mathematical Modelling, Numerical Continuation and Dynamical Systems and Individual – Based Models in Ecology/Biology	Room No.: 116 mohdhafizmohd@usm.my Ext. No.: 5059
13.	MOHD SHAREDUWAN BIN MOHD KASIHMUDDIN B. Sc., M.Sc., Ph.D (USM)	Neural Network	Room No. : 032 shareduwan@usm.my Ext. No. : 4769
14.	NG ZHEN CHUAN B.Sc., M.Sc. (UM) Ph.D. (USM)	Geometric Functions Theory, Complex Function Theory	Room No. : 109 zhenchuanng@usm.my Ext. No. : 5337
15.	NOOR SAIFURINA NANA KHURIZAN B.Sc. (USM) M.Sc. (SOUTHAMPTON) Ph.D. (USM)	Data Envelopment Analysis, Multi-Criteria Decision Making	Room No. : 013 saifurina@usm.my Ext. No. : 4989
16.	NORAZRIZAL ASWAD BIN ABDUL RAHMAN B.Sc., (USM) Ph.D. (UNIMAP)	Fuzzy Set Theory, Fuzzy Mathematics, Multi Criteria Decision Making	Room No. : 123 aswad.rahman@usm.my Ext. No. : 3944
17.	NORHASHIDAH AWANG B.Sc. (USM) M.Sc. (NUS) Ph.D. (UPM)	Spatial Statistics	Room No.: 041 shidah@usm.my Ext. No.: 4774
18.	NORLIDA MOHD. NOOR Ijazah Kepujian ITM M.Sc. (USM)	Applied Statistics	Room No.: 039 norlida@usm.my Ext. No.: 3958
19.	NORSHAFIRA RAMLI B.Sc. (BIRMINGHAM) M.Sc., Ph.D. (USM)	Boundary layer flow, heat transfer, mathematical modelling	Room No : 019 norshafiraramli@usm.my Ext. No. : 4763
20.	NUR NADIAH ABD HAMID B.Sc. (MICHIGAN STATE UNIVERSITY, US) M.Sc., Ph.D. (USM)	Numerical Analysis Computer Aided Geometric Design	Room No.: 023 nurnadiah@usm.my Ext. No.: 2356

NO.	SENIOR LECTURERS	AREAS OF RESEARCH	ROOM NO./ E-MAIL/ EXT.
21.	NUZLINDA ABDUL RAHMAN B.Sc., M.Sc. (USM) Ph.D. (UKM)	Spatial Statistics	Room No.: 126 nuzlinda@usm.my Ext. No.: 4781
22.	ONG WEN ENG B.Sc., M.Sc. (UM) Ph.D. (CANTERBURY)	Surface Approximation, Shortest path Algorithm	Room No.: 112 weneng@usm.my Ext. No.: 4781
23.	ROSMANJAWATI ABDUL RAHMAN B.Sc. (Ed), M.Sc. (UKM) Ph.D. (USM)	Applied Statistics	Room No.:119 rosmanjawati@usm.my Ext. No.: 4778
24.	SHAMANI SUPRAMANIAM B.Sc., M.Sc., Ph.D. (USM)	Univalent Function Theory, Complex Analysis	Room No.: 133 shamani@usm.my Ext. No.: 3384
25.	SHAMSUL RIJAL MUHAMMAD SABRI B.Sc., M.Sc. (UKM) Ph.D. (UM)	Applied Statistics	Room No.: 115 rijal@usm.my Ext. No.: 3964
26.	SITI AMIRAH ABD RAHMAN B.Sc. (UTM) M.Sc., Tech., Ph.D. (UNSW)	Discrete Optimization	Room No.: 020 amirahr@usm.my Ext. No.: 2355
27.	SITI NOOR FARWINA BT MOHAMAD ANWAR ANTONY M.Sc.(USM) Ph.D. (USM)	Number Theory, Cryptography	Room No.: 113 farwina@usm.my Ext. No.: 3965
28.	SYAKILA AHMAD B.Sc., M.Sc. (UKM) Ph.D. (UPM)	Mathematical Modelling, Fluid Dynamics, Convective Heat Transfer	Room No.: 130 syakilaahmad@usm.my Ext. No.: 4782
29.	TEH WEN CHEAN B.Sc., M.Sc. (USM) Ph.D. (OHIO STATE UNIVERSITY)	Combinatorics Logic	Room No.: 117 dasmenteh@usm.my Ext. No.: 4777
30.	YAZARIAH MOHD. YATIM B.Sc., M.Sc. (USM) Ph.D. (STRATCHLYDE)	Thin-film Flows, Travelling-wave and Similarity Solutions	Room No.: 134 yazariahmy@usm.my Ext. No.: 4783
31.	ZAINUDIN ARSAD B.Sc. (HERIOT-WATT) M.Sc. (SHEFFIELD) Ph.D. (HERIOT-WATT)	Time Series	Room No.: 036 zainudin.arsad@usm.my Ext. No.: 2069

**GUIDELINES FOR PREPARATION PROJECT REPORT (MGM 599/8)
FOR CANDIDATES REGISTERED IN
SEMESTER 1 & 2, ACADEMIC SESSION 2020/2021**

Introduction

The **Project Report** should be completed within the stipulated time. Candidates who fail to submit the Project Report within the stipulated time will be awarded a Grade F for the whole course and are required to repeat the project on a new topic. This set of guidelines is prepared to provide detailed explanation on the minimum requirements that have to be fulfilled by the candidates as well as the process and the aspects of examination of the project in partial fulfillment of the Master of Science (Teaching of Mathematics) Degree.

Please browse to www.math.usm.my for the latest guidelines.

Submission of Project Report

Reports can be written either in Bahasa Malaysia or English.

Candidates are required to submit **four (4)** copies of the Final Project Report (bound in red soft cover) for the purpose of examination together with the Project Submission Form that has been filled by the candidate and signed and approved by his/her supervisor (refer to Appendix B) to the Dean's office on a specified date. The final title and the translation of the project must also be included for confirmation and approval. The project report will not be examined until the candidate fulfills all the requirements.

Format

1. The full Project title, full name of the candidate, name of the School of Mathematical Sciences and the year of submission of the project for examination should be typed in capital letters of size 18 on the front cover as shown in the following example:

PROJECT TITLE

(Font size 18/single spacing)

NAME OF CANDIDATE

(Font size 18/single spacing)

**MGM 599/8 PROJECT REPORT
SCHOOL OF MATHEMATICAL SCIENCES
UNIVERSITI SAINS MALAYSIA**

(Font size 18/single spacing)

2021

(Font size 18)

4. The **Introduction** begins with the title page as shown in the example below:

<p style="text-align: center;">PROJECT TITLE (Font size 14/single spacing)</p> <p style="text-align: center;">by (Font size 12)</p> <p style="text-align: center;">NAME OF CANDIDATE (Font size 14/single spacing)</p> <p style="text-align: center;">Project submitted in partial fulfillment of the requirements for the degree of Master of Science (Teaching of Mathematics) (Font size 12/single spacing)</p> <p style="text-align: center;">August 2021 (Font size 14)</p>

If the Project Report written in Bahasa Malaysia, the example is as shown below:

<p style="text-align: center;">TAJUK PROJEK</p> <p style="text-align: center;">oleh</p> <p style="text-align: center;">NAMA CALON</p> <p style="text-align: center;">Projek diserahkan untuk memenuhi sebahagian keperluan bagi Ijazah Sarjana Sains (Matematik Pengajaran)</p> <p style="text-align: center;">Ogos 2021</p>
--

5. The **Introduction** is made up of a number of sections such as the Acknowledgment, Table of Contents, List of Tables (if any), List of Figures (if any), List of Symbols (if any), List of Abbreviations (if any), Abstrak and lastly the **Abstract**. All pages in the Introduction are numbered using lower case Roman numerals (i, ii, iii, etc.). The title page of the Project Report is considered as page i, but the number is not printed on the page.
6. All page numbers are without punctuation and placed 1cm from bottom centre. All pages including with figures, tables, etc. must have a page number.

7. An **Abstract** in both Bahasa Malaysia and English must be provided, the former version appearing before the latter. Both versions must have their respective titles. The Abstract is a summary of the entire Project and should provide a brief exposition of the research problems and aims, approaches taken to solve the problems and a summary of findings in the context of the whole area of study. Subsequent research proposals may be incorporated. This section should be double-spaced and the length of each version should not exceed 400 words. The Abstract should be placed immediately before the First Chapter of the Project Report.

8. The **Text** is made up of a number of sections. **The organization of this section is to be determined by the student and his/her supervisor(s).** As a general guideline, the length of the text should not exceed 10,000 words. For example, the **Text** can start with an introduction that highlights the problem(s) under investigation by describing the status of the problem(s) conceptually and theoretically. Besides that, the candidate can state the scope and objectives of the study and outline the plan of action or research protocol based on the status of the problem(s). The literature review may be written as a separate chapter and the materials that have been quoted or extracted should be relevant to the research topic, objectives, method or the research protocol and the basic theory or the approach used. The literature review should include the latest research findings from books, journals, magazines, research reports and the latest materials from the internet / websites. The subsequent chapters or sections in the **Text** may include research methods, results, discussion, summary or conclusion and recommendations for future research.

9. The standard margins for the general text are as follows:

Top	:	2.5 cm
Right	:	2.5 cm
Left	:	4.0 cm
Bottom	:	2.5 cm

10. The **Bibliography** is the section after the **Text** that begins on a fresh page bearing the heading in capital letters, centralized without any punctuation marks. The list of references begins four spaces below the heading, double-spaced between entries but single-spaced within each entry. A 3-space indentation should be used for any entry exceeding a single line. The style in which the references are presented and cited must be consistent throughout the Project Report. If a candidate makes use of other works in his/her project, either in direct quotation or by reference, these sources must be listed in the Bibliography. This includes tables and figures.

11. The **Appendix** is a section that is separated from the preceding material by a cover sheet bearing the heading **APPENDICES** in capital letters (or, if there is only one, **APPENDIX**), centralized without any punctuation marks. This sheet is not numbered and also not included in the total number of pages. Appendices present materials that are referred to in the text. It contains supplementary illustrative material, notes on the interview/questionnaires, data or quotations too long for inclusion in the text or long explanations about a particular method/experiment. Appendices may be divided into Appendix A, Appendix B, etc., such divisions being treated as first order subdivisions. Each appendix with its title, if it has one, should be listed separately in the Table of Contents as a first order subdivision under the heading APPENDICES. Tables and figures in the Appendices must be numbered and have captions and also listed in the List of Tables and List of Figures in the Introduction.

Examination of the Project

1. The supervisor and the Internal Examiner appointed by the School Board will be given a copy of the Project Report for examination purposes and to be completed within 3 weeks .
2. Candidates need to present a seminar on the Project that has been submitted for examination. The Project Report will be evaluated during the viva-voce sessions. It will be held on a specific date in the month of **July 2021** at the School of Mathematical Sciences (candidates will be notified the venue and the time two weeks before the viva). The seminar includes the presentation of the research background, framework, hypothesis, findings, discussion and recommendations. Each candidate will be allocate 15 minutes for the presentation and 10 minutes for the question and answer session.
3. The Panel for the viva-voce comprised by the Deputy Dean (Research, Innovation & Industry-Community Engagement), the Chairman of Academic Affairs (Pure Mathematics), the Supervisor and the Internal Examiner.
4. The scope of evaluation of the MGM 599/8 Course (Project) is as follows:

Evaluation	Percentage (%)
Originality / Authenticity	30
Presentation	40
Literature Review	20
Results / New method	10
Seminar (Viva-Voce)	Pass / Fail

5. Overall evaluation of the Project will be based on grades ranging from A to F. The passing grade is **B**.
6. Candidates are required to do all the corrections as specified by the viva-voce panel. All the reports need to be submitted with **two (2)** copies of hard cover bound in red buckram or rexine together with Project Submission Form (refer to Appendix C) which can be obtained from the general office.



PUSAT PENGAJIAN SAINS

RANCANGAN SARJANA SAINS [MATEMATIK PENGAJARAN]

Sidang Akademik.....

**BORANG PENGESAHAN PENYELIA KURSUS PROJEK
(Project Supervisor Confirmation Form)**

Kod Kursus : MGM 599/8

Nama Pelajar :
No. K/Pengenalan :
No. Matrik :
E-Mel :
Tandatangan Pelajar :
Tarikh :

Tajuk Projek :
.....
.....

Saya mengesahkan bahawa saya bersetuju untuk menyelia pelajar di atas pada
Sidang Akademik :
Nama Penyelia :
Tandatangan Penyelia :
Tarikh :



RANCANGAN SARJANA SAINS (Mod Kerja Kursus)

**BORANG PENYERAHAN PROJEK
(Project Submission Form)**

BAHAGIAN A

(Untuk diisi oleh calon)

Kepada : Dekan

Pusat Pengajian Sains Matematik

Universiti Sains Malaysia

11800 Pulau Pinang

Name : _____

No. Matrik : _____

Taraf Pencalonan : **Sambilan/Penuh Masa** (sila tandakan)

Alamat (terkini) : _____

No. Tel. : _____ E-Mel: _____

Tarikh : _____

Bersama-sama ini saya kemukakan **4 naskah projek** dalam bentuk berjilid dengan pembalut yang lembut (berwarna merah) bertajuk:

Terjemahan :-

1. Saya ingin mengesahkan bahawa projek tersebut telah pun disemak oleh Penyelia saya dan komen beliau adalah seperti yang terdapat di Bahagian B borang ini.

Sekian, terima kasih,

(Tandatangan Calon)

BAHAGIAN B

(Untuk diisi oleh Penyelia Utama)

Nama Penyelia: _____

Saya telah menyemak projek Encik/Puan/Cik _____ calon
Ijazah Sarjana Sains (Matematik Pengajaran) yang bertajuk:

.....
.....

1. Saya ingin mengesahkan bahawa saya berpuas hati dengan kemajuan yang dicapai oleh calon dan dilihat dari segi kualiti dan mutu bahasa, saya tiada halangan Projek tersebut diserahkan untuk tujuan penilaian.

Sekian, terima kasih.

(Tandatangan Penyelia)

(Tarikh)

BAHAGIAN C

(Untuk diisi oleh Dekan/Timbangan Dekan (Penyelidikan, Inovasi dan Libatsama Industri-Komuniti))

Saya ingin mengesahkan perakuan yang dibuat oleh Penyelia Projek calon ini seperti yang tercatat di Bahagian B di atas.

(Tandatangan Dekan/Timbangan Dekan)

(Tarikh)



PUSAT PENGAJIAN SAINS MATEMATIK
SCHOOL OF MATHEMATICAL SCIENCES

BORANG PENYERAHAN PROJEK MUTAKHIR
(Kursus MGM 599/8)
(Final Project Submission Form)

BAHAGIAN A

(Untuk diisi oleh calon)

Name : _____

Alamat (terkini) : _____

No. Tel. : _____ E-Mel: _____

Tarikh : _____

Bersama-sama ini saya kemukakan :-

- i) Dua (2) naskah berjilid dengan pembalut khas disertasi Ijazah Sarjana Sains **[Matematik Pengajaran]** bertajuk :-

Terjemahan :-

- ii) Saya ingin mengesahkan bahawa disertasi tersebut telahpun disemak oleh Penyelia Utama saya dan Dekan Pusat Pengajian, komen mereka adalah seperti yang dicatat pada Bahagian B dan C borang ini.

Sekian, terima kasih.

(Tandatangan Calon)

BAHAGIAN B

(Untuk diisi oleh Penyelia Utama)

Nama Penyelia : _____

Pusat Pengajian : _____

Saya telah menyemak pembedahan/pindaan yang dilaksanakan oleh Encik/Puan/Cik _____ mengenai projeknya sebagaimana yang dipersetujui oleh Jemaah Pemeriksaan Projek.

1. Saya ingin mengesahkan bahawa saya berpuas hati dengan pembedahan/pindaan yang dilaksanakan oleh calon.

Sekian, terima kasih.

(Tandatangan Penyelia)

(Tarikh)

BAHAGIAN C

(Untuk diisi oleh Dekan/Timbalan Dekan (Penyelidikan, Inovasi dan Libatsama Industri-Komuniti))

Saya _____ Dekan/Timbalan Dekan *(Penyelidikan, Inovasi dan Libatsama Industri-Komuniti)* Pusat Pengajian Sains Matematik ingin :-

- (i) Mengesahkan perakuan yang dibuat oleh Penyelia Calon;
- (ii) Mengesahkan bahawa saya berpuashati dengan pembedahan/pindaan yang dilaksanakan oleh calon sebagaimana yang dipersetujui oleh Jemaah Pemeriksaan Projek.

(Tandatangan Dekan/Timbalan Dekan)

(Tarikh)