

Bachelor of Science (Hons) Statistical Computing and Operations Research KPT/JPS(KA10094)11/14

This programme is a multi-major programme which includes statistics analysis, operations research study, computing as well as management skills, therefore our student will be well prepared for the job market's requirement. Also, this academic program equips students with the fundamentals and applications of statistical methods and operations research techniques to support quantitative analysis, modelling and solving in the scientific and business-related problems. Students will be exposed to managerial and computing skills to effectively and efficiently utilise and optimize the usage of organizational resources in service and manufacturing industries.

Students are required to undergo a period of industrial placement in manufacturing / service industries. This experience will prepare students to perform their final year project and enhance their future employability.

1.0 Careers Prospects

The programme will prepare students to pursue more challenging careers in both service and manufacturing industries such as statistician, quality control officer/executive, business analyst, production planner, production supervisor/engineer, operations research analyst, industrial engineer, researcher, business consultant and market surveyors.

In addition, a degree in statistical computing and operations research is excellent preparation for careers as:

- Data Analyst/ Data Specialist
- Business Consultant/Statistical Software Consultant
- Market Researcher
- Inventory Manager
- Statistician
- Quality Control officer/executive
- Supply Chain Management officer/executive
- Business Analyst/Executive
- Project Manager / Leader
- Production or Business Planner/Supervisor
- Operations Research Analyst
- Policy / System Planning Executive
- Consultant
- Analyst Programmer
- Risk Assessor
- Survey Firm Consultant
- Statistical Software Consultant
- Researcher
- Lecturer / Teacher

2.0 Objectives of the Course of Study

The main objectives of this undergraduate programme are:

- To ensure students acquire comprehensive understanding in the fundamentals and applications of statistical methods and operations research techniques.
- To equip students with managerial and quantitative approach towards problem analysis, modelling and solving.
- To enable students to pursue postgraduate study in statistics and operations research.
- To produce students who are able to practice lifelong learning attitudes, continuously challenging themselves to improve and remain relevant to the ever changing needs of industry, locally as well as internationally.
- To produce students who are competent in communication and interpersonal skills.
- To produce students who are able to perform fundamental research in statistics and operations research.

3.0 Programme Learning Outcomes

At the end of the course, students should be able to:

- Contribute towards the development of better working procedure and systematic approach in problem analysis, modelling and implementation of solutions at the workplace.
- To execute statistical methods and operations research techniques via software packages and customized computer programmes.
- Demonstrate critical thinking, leadership skills and professional competence that are relevant to process optimization and statistical data analysis to support managerial decision making.
- Develop the capability to customize the statistical and operations research packages/software to perform various mathematical models on an ad-hoc basis.
- Integrate the concepts, principles and strategies of management and business with the statistical and operations research techniques in the planning, analysis and implementation of organizational strategy.
- Recognize and practice the concept of lifelong learning for continuous self improvement.
- Demonstrate an understanding and awareness of basic commercial, ethical, legal and social issues as well as responsibility related to manufacturing and service industries.
- Communicate and demonstrate adequate social and interpersonal skills.

4.0 Strengths of the Programme

Our strengths in this program include:

- Approved by MQA with code KP/JPS(KA10094)11/14.
- In the competitive manufacturing and service industries, this programme provides specialized academic knowledge in applied statistics techniques, statistical packages programming and mathematical modelling to analyze and interpret internal and external data as well as to optimize the usage of limited resources available, solve operational problems and facilitate better managerial decision making in the workplace.
- In Malaysian education market, there are not many programs that cater for students who are interested in studying statistical computing and operations research. This programme emphasizes on the fundamentals of statistical methods, operations research and programming techniques as well as analyzing and applying these competences to enhance organizational effectiveness and efficiency. Ultimately, it prepares students to assume positions of increasing responsibilities in facilitating better managerial decision making within operations of manufacturing and service industries.
- This programme is unique as it consists of three major fields of study (Statistic, Operations Research and Management) in one programme. These fields of study will equip the students a wide range of knowledge and skill to be utilized in the job market in the future.
- Unlimited license for several statistical and operations research software. (SAS, SPSS, R language, Microsoft Excel, TORA, AMPL etc.)
- Graduates can apply for membership in statistics and operations research professional bodies associations locally and internationally.
- Graduate can join the professional bodies like Royal Statistical Society UK, The Operational Research Society UK, Malaysian Institute of Statistics, The Operations Research /Management Science Society of Malaysia and etc.

Compared with other main competitors

- IPTAs – Undergraduate programmes majoring in mathematics and/or statistics. Ex. USM, UUM, UPM, UTM and etc.
 - No specific emphasis on management knowledge.
 - Coverage on statistical and operations research techniques is not as comprehensive as our academic programme.
- IPTSs – MSU's Bachelor in Decision Science (Hons).
 - Their academic programmes emphasize more on the usage of operations research techniques in solving management problems and issues.
 - Our academic programme emphasize on the usage of statistical and operations techniques in management and operations problems faced by business entities.
 - Coverage on statistical and operations research techniques is not as comprehensive as our academic programme.

5.0 Vision of UTAR

The vision of UTAR is to be a premier university aspiring to achieve excellence in the advancement and dissemination of knowledge and expertise, emphasizing nurturing and holistic development of the individual towards nation building.

6.0 Mission of UTAR

- To be a leading university offering education of the highest standard in all significant fields aimed at fully developing the individual and better serving the nation. UTAR shall pursue a rigorous academic approach towards producing disciplined graduates critical in their thinking and dedicated to the quest of continuous learning and the pursuit of excellence.
- Committed to the advancement of knowledge. UTAR shall collaborate with international universities, research institutions, and industries in pushing the frontiers of the humanities and embarking on scientific discoveries, medical breakthroughs and technological innovations.
- Dedicated to inculcating among the UTAR community high moral values, appreciation of the rich diversity in a multiethnic society and an abiding concern for the betterment of all humankind.

7.0 The programme aims, objectives, and learning outcomes are in line with the university's vision and mission

UTAR's Vision	UTAR's Mission	Programme Aims and Objectives
To be a premier university aspiring to achieve excellence in the advancement and dissemination of knowledge and expertise	To be a leading university offering education of the highest standard in all significant fields aimed at fully developing the individual at better serving the nation. UTAR shall pursue a rigorous academic approach towards producing disciplined graduates critical in their thinking and dedicated to the quest of continuous learning and the pursuit of excellence	<ul style="list-style-type: none">♦ To ensure students acquire comprehensive understanding in the fundamentals and applications of statistical methods and operations research techniques.♦ To equip students with managerial and quantitative approach towards problem analysis, modelling and solving.♦ To produce students who are able to perform fundamental research in statistics and operations research.♦ To enable students to pursue postgraduate study in statistics

UTAR's Vision	UTAR's Mission	Programme Aims and Objectives
		and operations research.
To be a premier university aspiring to achieve excellence in the advancement and dissemination of knowledge and expertise	Committed to the advancement of knowledge. UTAR shall collaborate with international universities, research institutions, and industries in pushing the frontiers of the humanities and embarking on scientific discoveries, medical breakthroughs and technological innovations	<ul style="list-style-type: none"> ♦ To equip students with managerial and quantitative approach towards problem analysis, modelling and solving. ♦ To produce students who are able to perform fundamental research in statistics and operations research. ♦ To enable students to pursue postgraduate study in statistics and operations research.
Emphasising nurturing and holistic development of the individual towards nation building	Dedicated to inculcating among the UTAR's community high moral values, appreciation of the rich diversity in a multiethnic society and an abiding concern for the betterment of all humankind.	<ul style="list-style-type: none"> ♦ To produce students who are able to practice lifelong learning attitudes, continuously challenging themselves to improve and remain relevant to the ever changing needs of industry, locally as well as internationally. ♦ To produce students who are competent in communication and interpersonal skills.

8.0 Study Scheme for Programme

Bachelor of Science (Hons) Statistical Computing and Operations Research

Year 1								
Trimester I			Trimester II			Trimester III		
Code	Unit	Credit	Code	Unit	Credit	Code	Unit	Credit
UALE1063	English for Science	3	UBEA1013	Economics	3	MPW2133	Pengajian Malaysia	3
UCCS1633	Fundamental of Programming	3	UBMM1013	Management Principles	3	MPW2143 / MPW2153	Pengajian Islam / Pendidikan Moral	3
UDPS1003	Calculus	3	UBTM1013	Principles of Marketing	3	MPW2113/ MPW2123/	Bahasa Kebangsaan (A)*/ Bahasa Kebangsaan (B)**/ Foreign Languages***	3
UDPS1013	Linear Algebra	3	UDPS1063	Linear and integer Programming	3			
UDPS1023	Introduction to Probability and Statistics	3	UDPS1103	Advanced Calculus	3			
UDPS1043	Introduction to Operations Research	3	UDPS1113	Applied Statistical Methods	3			
TOTAL CREDIT VALUE		18	TOTAL CREDIT VALUE		18	TOTAL CREDIT VALUE		9

*For Malaysian only; **For Non-Malaysian only

*** Students who are exempted from taking MQA compulsory subjects, MPW2113 Bahasa Kebangsaan (A) / MPW2123 Bahasa Kebangsaan (B), are required to take any one of the following language subjects such as UALF1003 Introduction To French, UALJ2013 Introduction To Japanese, UALM1003 Introduction to Tamil Language, UALT1003 Introduction To Thai Language.

Year 2								
Trimester I			Trimester II			Trimester III		
Code	Unit	Credit	Code	Unit	Credit	Code	Unit	Credit
UBAI2013	Managing information systems	3	UBMM1011	Sun Zi's Art of War and Business Strategies	1	UDEC2306	Industrial Training	6
UDPS2013	Numerical methods	3	UDPS2023	Linear Regression Analysis	3			
UDPS2033	Sample survey and sampling techniques	3	UDPS2123	Applied Non-Parametric Methods	3			
UDPS2043	Project scheduling and network modeling	3	UDPS2133	Mathematical Programming	3			
UDPS2053	Mathematical statistics	3	UDPS2143	Design And Analysis Of Experiment	3			
UDPS2103	Differential equations	3	UDPS2163	Inventory Control And Decision Analysis	3			
			USCC10X2	Co-Curricular Units	2			
TOTAL CREDIT VALUE		18	TOTAL CREDIT VALUE		18	TOTAL CREDIT VALUE		6

Year 3								
Trimester I			Trimester II			Trimester III		
Code	Unit	Credit	Code	Unit	Credit	Code	Unit	Credit
UBMM2013	Operations Management	3	UBMM2023	Organisational Behaviour	3	UALL1063	Oral Communication And Interpersonal Skills	3
UBXXXXX3	Elective II	3	UBMM3013	Strategic Management	3	UBTE3023	Managing Innovation	3
UXXXXXX3	Elective I	3	UDPS3193	Research Project II	3			
UDPS3113	Queuing Models And Simulation	3	UDPSXXX3	Major Elective	6			
UDPS3183	Research Project I	3						
TOTAL CREDIT VALUE		15	TOTAL CREDIT VALUE		15	TOTAL CREDIT VALUE		6

TOTAL ACADEMIC CREDITS = 121
CO-CURRICULUM CREDIT = 2
TOTAL CREDITS =123

UBXXXXX3 Elective II - Choose 1 unit

UBTE2013 – Entrepreneurship

UBMH2013 - Human Resource Management

UBMB3013 - International Business

UXXXXXX3 Elective I - Choose 1 unit

UCCD1023 - Data Structures And Algorithms

UDPS2173 - Stochastic Programming

UCCD2183 - Object-Oriented Programming

UDPSXXX3 Major Elective - Choose 2 units

UDPS2113 - Statistical Simulation

UDPS3123 - Time Series Analysis

UDPS3133 - Multivariate Analysis

UDPS3143 - Statistical Quality Control

9.0 Is this Programme for me?

Yes, if you

- love mathematics (can do well in mathematics and statistics) and wish to apply the knowledge in business, marketing, management and etc. However, you may not want to specialize in pure mathematics.
- would like to venture into different areas.
- would like to have wider job-scope.
- would like to make yourself more marketable, versatile and compatible to current and future job market!

10.0 Entry Requirement

The entry requirements currently for this program are as follows. Please be noted that students with other relevant or different progression routes will also be considered.

Sijil Tinggi Persekolahan Malaysia (STPM) with minimum Principal Passes in Two (2) subjects (preferably including Mathematics) and credit in SPM Mathematics.

Or “A” Levels with minimum passes in Two (2) of the relevant subjects (including Mathematics) and credit in SPM Mathematics.

Or South Australian Matriculation (SAM) with TER (*Tertiary Entrance Rank*) 70, and Grade B in two (2) of the relevant subjects (including Mathematics).

Or Canadian Pre-University (CPU) with an average of 70% in two (2) of the relevant subjects, (including Mathematics).

Or Unified Examination Certificate (UEC) with an average of Grade B in six (6) of the relevant subjects (including Mathematics).

Or Matriculation Certificate, Ministry of Education, Malaysia with CGPA 2.5 or above.

Or Foundation in Science, Universiti Tunku Abdul Rahman (UTAR) with minimum CGPA 2.00.

Or Diploma qualification, Tunku Abdul Rahman College (KTAR) with minimum CGPA 2.00.

Or Foundation qualification from other Institutions of Higher Learning with minimum CGPA 2.00.

Or Diploma qualification from other Institutions of Higher Learning with minimum CGPA 2.

Or Other equivalent qualifications recognized by the Malaysian Government.

11.0 Comments by External Examiners / Industry Advisors / Collaborators / Visitors on the Programme

Name: Prof. Howell Tong

Job: Emeritus Professor

Company: London School of Economics, United Kingdom

Do you use statistics (or operations research) in your job? How are they important?

Although I am retired now, I still use statistics both professional and in my daily life. Professionally, I still do original research in statistics. In my daily life, I find that statistics is indispensable even in understanding data, reports in the newspaper – so often misrepresented! Living in a world full of uncertainties, statistics is essential for everybody.

What is your opinion for the future prospect of statistics (or operations research) in the world (or Malaysia)?

As we collect more and more data, we need tools to analyze them and statistics is the science to handle data anywhere in the world.

Do you think the knowledge of statistics (or operations research) is important for students nowadays?

Yes, very much so. Numeracy is of paramount importance in most occupations and personal finance. Statistics is the science to handle risk and uncertainties.

Do you recommend students to major in statistics (or operations research)?

Of course, if he or she is intelligent.

12.0 Student's Testimonial / Success Story to Share

"I am very much into mathematics and I am more attracted to SCOR because it encompasses more areas of applied mathematics." [Teo Xuan Shong](#)

"SCOR is interesting and provides good job prospects in a wide range of industries such as banking, insurance, manufacturing, marketing and logistics." [Chen Woon Bing](#)

(Star special, Higher Education. Wednesday, 22 August 2012.)