

MAST30022 Decision Making

| Credit Points: | 12.5 | | | | | | | | | | | | | | | | | |
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| Level: | 3 (Undergraduate) | | | | | | | | | | | | | | | | | |
| Dates & Locations: | 2016, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus. | | | | | | | | | | | | | | | | | |
| Time Commitment: | Contact Hours: 3 x one hour lectures per week, 1 x one hour practice class per week Total Time Commitment: Estimated total time commitment of 170 hours | | | | | | | | | | | | | | | | | |
| Prerequisites: | <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>MAST20018 Discrete Maths and Operations Research</td> <td>Semester 2</td> <td>12.50</td> </tr> </tbody> </table> <p>and one of</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>MAST20004 Probability</td> <td>Semester 1</td> <td>12.50</td> </tr> <tr> <td>MAST20006 Probability for Statistics</td> <td>Semester 1</td> <td>12.50</td> </tr> </tbody> </table> | | | Subject | Study Period Commencement: | Credit Points: | MAST20018 Discrete Maths and Operations Research | Semester 2 | 12.50 | Subject | Study Period Commencement: | Credit Points: | MAST20004 Probability | Semester 1 | 12.50 | MAST20006 Probability for Statistics | Semester 1 | 12.50 |
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| MAST20018 Discrete Maths and Operations Research | Semester 2 | 12.50 | | | | | | | | | | | | | | | | |
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| MAST20006 Probability for Statistics | Semester 1 | 12.50 | | | | | | | | | | | | | | | | |
| Corequisites: | None | | | | | | | | | | | | | | | | | |
| Recommended Background Knowledge: | None | | | | | | | | | | | | | | | | | |
| Non Allowed Subjects: | None | | | | | | | | | | | | | | | | | |
| Core Participation Requirements: | <p><p>For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry.</p> <p>It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability</p></p> | | | | | | | | | | | | | | | | | |
| Coordinator: | Assoc Prof Sanming Zhou | | | | | | | | | | | | | | | | | |
| Contact: | Third Year Coordinator Email: tycoord@ms.unimelb.edu.au (mailto:tycoord@ms.unimelb.edu.au) | | | | | | | | | | | | | | | | | |
| Subject Overview: | This subject introduces the essential features of decision-making techniques encountered in operations research, management, industry, business and economics. It shows how to construct formal mathematical models for practical decision-making as encountered in two-person games, multi-objective optimisation problems, stochastic decision problems, group decision and social choice, and decision-making under uncertainty. It shows students further uses of linear programming and introduces dynamic programming techniques. | | | | | | | | | | | | | | | | | |
| Learning Outcomes: | <p>On completion of this subject, students should be able to</p> <ul style="list-style-type: none"> # construct mathematical models for practical decision-making problems; # solve two-person games by using linear programming, including zero-sum and non-zero-sum games, cooperative and non-cooperative games; | | | | | | | | | | | | | | | | | |

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| | <ul style="list-style-type: none"> # use decision tree and dynamic programming techniques in solving multi-objective optimisation problems; # solve decision-making problems using utility theory; # understand the complexity of group decision and social choice problems together with possible approaches; # solve stochastic decision problems using techniques from probabilistic dynamic programming and Markov decision processes. |
| Assessment: | Three or four written assignments due at regular intervals during semester amounting to a total of up to 50 pages (20%), and a 3-hour written examination in the examination period (80%). |
| Prescribed Texts: | None |
| Breadth Options: | <p>This subject potentially can be taken as a breadth subject component for the following courses:</p> <ul style="list-style-type: none"> # Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2016/B-COM) # Bachelor of Environments (https://handbook.unimelb.edu.au/view/2016/B-ENVS) # Bachelor of Music (https://handbook.unimelb.edu.au/view/2016/B-MUS) <p>You should visit learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html) and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.</p> |
| Fees Information: | Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees |
| Generic Skills: | <p>In addition to learning specific skills that will assist students in their future careers in science, they will have the opportunity to develop generic skills that will assist them in any future career path. These include:</p> <ul style="list-style-type: none"> # problem-solving skills: the ability to engage with unfamiliar problems and identify relevant solution strategies; # analytical skills: the ability to construct and express logical arguments and to work in abstract or general terms to increase the clarity and efficiency of analysis; # collaborative skills: the ability to work in a team; # time-management skills: the ability to meet regular deadlines while balancing competing commitments. |
| Notes: | This subject is available for science credit to students enrolled in the BSc (both pre-2008 and new degrees), BAsC or a combined BSc course. |
| Related Majors/Minors/Specialisations: | <p>Discrete Mathematics and Operations Research (specialisation of Mathematics and Statistics major)</p> <p>Science-credited subjects - new generation B-SCI and B-ENG.</p> <p>Selective subjects for B-BMED</p> |