UNIVERSITI MALAYA

MAKLUMAT KURSUS UNTUK SEMESTER/PENGGAL SEMASA
COURSE INFORMATION FOR CURRENT SEMESTER/TERM

Sesi Akademik *Academic Session*	2020/2021
Semester/Penggal *Semester/Term*	2
Kod Kursus *Course Code*	KIE4024
Tajuk Kursus *Course Title*	Kaedah Pengoptimuman *Optimization Methods*
Bahasa Pengantar *Medium of Instruction*	Bahasa Inggeris *English*
Rujukan Utama *Main Reference*	1. Brian D. O. Anderson,Optimal Control: Linear Quadratic Methods. New York, NY: Dover, 2007. ISBN: 9780486457666. 2. Bryson, Arthur, and Yu-Chi Ho. *Applied Optimal Control: Optimization, Estimation, and Control*. Abingdon, UK: Taylor & Francis, 1975. ISBN: 9780891162285. 3. Vincent, Thomas, and Walter Grantham. *Nonlinear and Optimal Control Systems*. New York, NY: Wiley, 1997. ISBN: 9780471042358. 4. Kwakernaak, Huibert, and Raphael Sivan. *Linear Optimal Control Systems*. New York, NY: Wiley, 1972. ISBN: 9780471511106. 5. Kirk, Donald. *Optimal Control Theory: An Introduction*. New York, NY: Dover, 2004. ISBN: 9780486434841. 6. Stengel, Robert. *Stochastic Optimal Control*. New York, NY: Wiley, 1986. ISBN: 9780471864622. 7. D.T. Pha and D. Karaboga, Intelligent Optimization Technique,2012, Springer Science & Business Media, ISBN:9781447107217
Strategi Pembelajaran *Learning Strategies*	Kuliah, Seminar, dan Perbincangan Kumpulan *Lectures, Seminar and Group Discussion*
Masa Pembelajaran Pelajar *Student Learning Time*	Bersemuka / *Face to face* : 31 jam/*hours* Tidak Bersemuka / *Non Face to face*: 0 jam/*hour* Masa Persediaan Pelajar / *Student Preparation Time*: 49 jam/*hours*
Kemahiran Boleh Pindah Transferable Skills	Programming
Pensyarah / *Lecturer* Bilik / *Room* Telefon/e-mel *Telephone/e-mail*	Dr. Jeevan Kanesan Tingkat 2 79675388 jievan@um.edu.my
Sesi Kuliah / *Lecture Session:* Hari/Masa / *Day/Time* Tempat / *Venue*	Rujuk kepada myum.um.edu.my. *Refer to* myum.um.edu.my.
Sesi Tutorial/Amali: *Tutorial/Practical Session:* Hari/Masa / *Day/Time*	Tiada *No*

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Tempat / *Venue*	
Perincian Pemberatan Penilaian *Detail of Assessment Weightage*	Penilaian Berterusan / *Continuous Assessment* : 40% Peperiksaan Akhir / *Final Examination* : 60%

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Jadual Pengajaran / *Teaching Schedule*

Week	Lecture/Tutorial/Assignment Topic	References/Teaching Materials/Equipment
1	Pengaturcaraan linear *Linear programming*	*See Main Reference*
2	Pengoptimunan tidak-linear: pengoptimuman tidak-linear tak terkekang/terkekang, kaedah pencarian garisan, pendarab Lagrange *Nonlinear optimization: unconstrained/ constrained nonlinear optimization, line search methods, Lagrange multipliers*	*See Main Reference*
3	Pengaturcaraan dinamik: prinsip optimaliti, pengaturcaraan dinamik, LQR diskrit *Dynamic programming: principle of optimality, dynamic programming, discrete LQR*	*As the above*
4	Model HJB: persamaan HJB, LQR selanjar *HJB models: HJB equation, continuous LQR*	*As the above*
5	Kalkulus variasi dan aplikasinya untuk kawalan optimum *Calculus of variations and its application to optimal control*	*Most books cover this material well, but Kirk (chapter 4) does a particularly nice job*
6	Sifat-sifat penyelesaian kawalan optimum: arka singular *Properties of optimal control solution:singular arcs*	*Bryson and Ho, Section 3.5 and Kirk, Section 4.4*
7	Penyelesaian masalah pengoptimunan kompleks 1 *Complex Optimization Solving problem 1*	*All references*
8	Penyelesaian masalah pengoptimunan kompleks 1 *Complex Optimization Solving problem 1*	*All references*
9	Penganggar/pemerhati, kawalan optimum Stochastic *Estimators/Observers ,Stochastic optimal control*	*Same as the above* *Bryson and Ho, section 3.x and Kirk, section 5.3*
10	Keteguhan LQG *LQG robustness*	*As the above* *Bryson, chapter 8 and Kirk, section 5.6*
11	Kaedah pengoptimunan Stochastic (a) algoritma Metropolis-Hastings dan pensampelan Gibbs (b) penyepuhlindapan terangsang *Stochastic optimization methods; (a) Metropolis-Hastings algorithm and Gibbs sampling; (b) Stimulated annealing;*	*D.T. Pha and D. Karaboga,.*
12	Kaedah pengoptimunan Stochastic (c) algoritma evolusi (d) pencarian Tabu (d) algoritma berasaskan Swarm *Stochastic optimization methods; (c) Evolutionary algorithms; (d) Tabu search; (e) Swarm based algorithms*	*D.T. Pha and D. Karaboga*
13	Penyelesaian masalah pengoptimunan kompleks 2 *Complex Optimization Solving problem 2*	*All references*

14	Penyelesaian masalah pengoptimunan kompleks 2 *Complex Optimization Solving problem 2*	*All references*