

TEC DE MONTERREY CAMPUS AGUASCALIENTES

ESCUELA DE INGENIERÍA Y CIENCIAS

FEBRUARY - JUNE 2020

PÁGINA 1

MA3002 Advanced Mathematics

1. GENERAL INFORMATION OF THE COURSE

Subject: **Advanced Mathematics**

Code: **MA3002**

Group: **1**

Schedule: **Monday & Wednesday 5:30 pm – 7:00 pm**

Room: **133B**

Platform: **www.advanced-math.tech**

Platform or additional site: **<https://experiencia21.tec.mx> or from *Mi Tec*.**

2. TEACHER'S INFORMATION

Teacher's name: **Dr. Juan-Manuel CAMPOS-SANDOVAL**

E-mail: **Building 2 Second Floor**

You can reach your teacher at: **4499100900 Ext. 5323 / cell 4491070807 / Whatsapp Group: [advanced-math.tech](https://www.whatsapp.com/group/advanced-math.tech)**

Time and place for tutoring: **anytime on demand.**

3. COURSE OBJECTIVE:

This is an advanced course aimed to help students to understand the mathematical concepts of complex variable, the methodologies of linear algebra and integral transforms (Laplace specially) and be able to apply these concepts to engineering problems using the appropriate information technologies to solve them. The course requires prior knowledge of calculus of several variables and basis of vector calculus. As a result of taking this course, students will solve problems involving the use of complex variable functions, systems of linear equations and Laplace Transform in Dynamic Systems. There will be activities that will be performed individually and in teams, inside and outside the classroom. Such activities will help the student to reinforce the concepts reviewed in class.

4. COURSE POLICIES:

- a) **Punctuality:** arriving time, absence leaves and turning activities in. There is no such thing as late arrivals or justified absences. Attendance will be checked in the first five minutes. The door will then be closed and no one will be allowed to come in late. In order to keep your attendance, you must remain in class throughout the whole class.
Responsibility: all activities should be turned in on time and according to given indications, otherwise they will not be taken into account. All the homework should be done individually, unless differently stated. Your homework must include your name, i.d.number, name of the course, group and subject
- b) **Conduct:** no food or drinks are allowed for intake in class; neither is the use of **tablets, mobile phones or other devices, unless specifically used for class activities**. Throughout class you must be paying attention, respectfully and in order, otherwise you will be requested to leave the room.
- c) **Homework:** All the homework will be taken into account as complete and turned in, and will be graded according to content and quality. Unless differently requested, all homework must be typed out and uploaded in Blackboard (no e-mails, or handwritten homework). The homework must be uploaded before class on the due date. Should you fail to turn it in, you will automatically lose the grade for that particular assignment.
- d) **Partial exams, quizzes and final exams.** There will be no changes on the appointed dates for exams (partials, final and quizzes). Should you be absent for any of these exams, an NP (not presented) will be reported, and you will lose your grade.

5. SCHEDULE



SCHEDULE

FJ 2020

SUBJECT:	Advanced Mathematics	CODE:	MA3002
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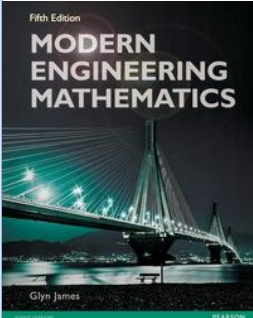
TEACHER	Dr. Juan-Manuel CAMPOS-SANDOVAL	EMAIL	juan-manuel.campos@tec.mx
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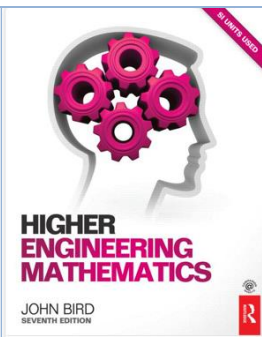
CLASS DAYS	MONDAYS & WEDNESDAY	TIME	5:30-7:00 PM	ROOM	133B
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COURSE OBJECTIVE	UPON COMPLETION OF THIS COURSE, STUDENTS WILL BE ABLE TO: 1. USE METHODOLOGIES TO ANALYZE AND SOLVE MATHEMATICS ENGINEERING-RELATED PROBLEMS (COMPLEX NUMBERS, LINEAR SYSTEMS, LAPLACE TRANSFORMS). 2. USE COMPUTER TOOLS TO SOLVE MATHEMATICS ENGINEERING-RELATED PROBLEMS (COMPLEX NUMBERS, LINEAR SYSTEMS, LAPLACE TRANSFORMS). 3. APPLY THESE MATHEMATICAL AND COMPUTER TOOLS AT LEAST TO ONE MODELLING SITUATION AND/OR TO ONE EXPERIMENTAL SITUATION.
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PARTIAL GRADE	
ACTIVITIES & SIMULATIONS	30
QUIZES	15
INTEGRATOR EXAMS	40
MINI-PROJECTS	15
ARGUMENTATIVE EXAMINATIONS	5
GRADE	105

FINAL GRADE	
PARTIAL 1	30
PARTIAL 2	30
PARTIAL 3	10
PROJECT & SIMULATION	10
FINAL EXAM	25
GRADE	105

BIBLIOGRAPHY	 MODERN ENGINEERING MATHEMATICS BY: GLYN JAMES PUBLISHER: PEARSON (INTL) PRINT ISBN: 9781292080734, 1292080736 ETEXT ISBN: 9781292080826, 1292080825 EDITION: 5TH COPYRIGHT YEAR: 2015
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HIGHER ENGINEERING MATHEMATICS

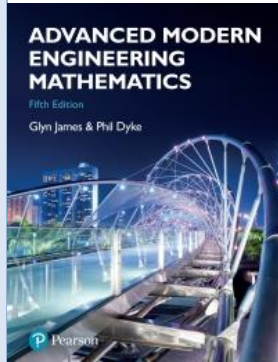
BY: JOHN BIRD

PUBLISHER: Routledge

ISBN: 978-0-415-66282-6 (pbk)

ISBN: 978-0-315-85882-1 (ebk)

EDITION: 7TH COPYRIGHT YEAR: 2014



ADVANCED MODERN ENGINEERING MATHEMATICS

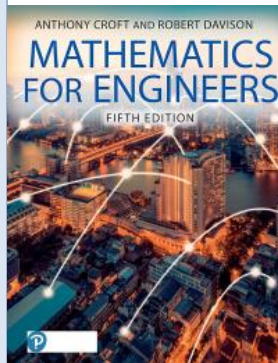
BY: GLYN JAMES; DAVID BURLEY; DICK CLEMENTS; PHIL DYKE; N. STEELE

PUBLISHER: PEARSON (INTL)

PRINT ISBN: 9781292174341, 129217434X

ETEXT ISBN: 9781292175829, 1292175826

EDITION: 5TH COPYRIGHT YEAR: 2018



MATHEMATICS FOR ENGINEERS

BY: ANTHONY CROFT; ROBERT DAVISON

PUBLISHER: PEARSON (INTL)

PRINT ISBN: 9781292253640, 1292253649

ETEXT ISBN: 9781292267661, 1292267666

EDITION: 5TH COPYRIGHT YEAR: 2019

VIDEOS	SEVERAL ON YOUTUBE
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CASES	-MODEL OF A DYNAMIC SYSTEM USING MATLAB AND/OR SIMULINK -EXPERIMENTAL MODEL OF AN AERODYNAMIC SHAPE
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COURSE TIMETABLE

DAY	DATE	TOPIC	ACTIVITIES	Notes
1	Monday	February 10	Presentation Chapter 3: Complex Numbers 3.1 Introduction 3.2 Properties I	
2	Thursday	February 13	3.2 Properties II	

3	Monday	February 17	3.3 Powers of complex numbers I	
4	Thursday	February 20	3.3 Powers of complex numbers II	
5	Monday	February 24	3.4 Loci in the complex plane I	
6	Thursday	February 27	3.4 Loci in the complex plane II 3.5 Functions of a complex variable I	
7	Monday	March 2	3.5 Functions of a complex variable II	
8	Thursday	March 5	3.6 Engineering application: alternating currents in electrical networks I	
9	Monday	March 9	3.6 Engineering application: alternating currents in electrical networks II	
10	Thursday	March 12	3.7 Review exercises I	
11	Monday	March 16	Holiday	
12	Thursday	March 19	3.7 Review exercises II	
13	Monday	March 23	First Integrator Exam	
14	Monday	March 30	Chapter 5: Matrix Algebra 5.1 Introduction 5.2 Definitions and properties	
15	Thursday	April 2	5.3 Determinants	
16	Monday	April 6	Holiday	
17	Thursday	April 9	Holiday	
18	Monday	April 13	5.4 The inverse matrix	
19	Thursday	April 16	5.5 Linear equations	
20	Monday	April 20	5.6 Rank	
21	Thursday	April 23	5.7 The eigenvalue problem	
22	Monday	April 27	5.7 The eigenvalue problem	
23	Thursday	April 30	5.8 Engineering application: spring systems	
24	Monday	may 04	5.9 Engineering application: steady heat transfer through composite materials	
25	Thursday	may 07	5.10 Review exercises	
26	Monday	may 11	Second Integrator Exam	
27	Thursday	may 14	Chapter 11: Introduction to Laplace Transforms 11.1 Introduction 11.2 The Laplace transform	
28	Monday	may 18	11.3 Solution of differential equations	
29	Thursday	may 21	11.3 Solution of differential equations	
30	Monday	may 25	11.4 Engineering applications: electrical circuits and mechanical vibrations	
31	Thursday	may 28	11.4 Engineering applications: electrical circuits and mechanical vibrations	
32	Monday	June 1	11.5 Review exercises	

Appendix 1: All dates on this timetable are subject to changes according to different unforeseen situations or events. The teacher will also be free to change or add activities or homework, according to the group's development and needs, in order to reach the objectives of the course.

Appendix 2: The activities and homework described in this TIMETABLE can be modified according to the teacher's criteria.

6. PARTIAL AND FINAL EVALUATION DATES

(All official dates and hours must be respected, therefore school calendars should be checked in advance)

Final exam: Monday 8th June