EEEN19680 Supplementary Maths (nee Engineering Mathematics)

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Time slots

First semester 27/Sep-13/Dec except 1/Nov

Day	Building	Room	Time
Monday	Renold	C16	13:00-15:00

Second semester 7/Feb -16/May except 4-24/Apr

Day	Building	Room	Time
Monday	SSB	F47	13:00-15:00

The content of each session is different.

Comparison between lectures from Math and ones from EEE

Contents for the first semester

topic	EEEN19680	MATH19681
Vector	6 sessions	5 sessions
Coordinate	4 sessions	5 sessions
Complex numbers	6 sessions	6 sessions
Differentiation	4 sessions	3 sessions
Integral	4 sessions	4 sessions

Focus in EEEN19680

- ▶ **Acquire the techniques/skills to solve problems**
- ▶ **Get used to a variety of problems**
- ▶ **Learn how to write answers**

$\Longrightarrow$ **Each session is the practice of the exams!**

Quality and Quantity of materials

Level of the questions

1. **Supposed to be about 1-2 sessions ahead of MATH19681**
2. **From the fundamental level to 1st Class level and beyond (Fundamental theory by MATH19681. Exam practice by EEEN19680.)**
3. **Explained well enough for the prerequisite level to understand**

Volume of the questions

1. **Too much to solve all in one session**
2. **Useful to take a look at even when not dealt with in the lecture**

The handout

Online

- **The prerequisite information, the key notes, and questions for Year 1 mathematics**
- **A set of slides for each week**
- **Answers of questions of each week**

are placed at EEEN19680EngMath/Pre-recorded.../ in BlackBoard(BB)

The structure of each week

Before the live lecture

5 mins **Watch a pre-recorded video on explanation of key points of the week and demonstration to solve some questions**

3 mins **Test your understanding of the video by trying out specified math quizzes which are accessible from BlackBoard**

During the live lecture

10 mins **We go through key points of the week**

100 mins **Try out some practical questions**

The structure of each lecture

After the lecture

1. **Solve the rest of "today's questions"**
   1. Plan the procedure to solve the question for *3 minutes*
   2. Write down the procedure you produced. Only if you are confident on your procedure, keep solving the question.
   3. Read worked-out answers provided, comparing with your procedure
2. **Identify the problems you faced in the answers**
3. **List them up to take with you and ask us at the next session**
4. **Repeat "plan the procedure" and "read answers" till you can build the correct plan**

Contents for the first semester

Week 1 27/Sep/2021

Content (vectorDAY1,vectorDAY2) **vector addition, position vector, column notation, magnitude of vector, scalar product, vector product, angle of two vectors, unit vector**

Contents for the first semester

Week 2 4/Oct/2021

Content (vectorDAY3,vectorDAY4) **vector equation, intersection of 2 lines, demonstration of a problem**

Contents for the first semester

Week 3 11/Oct/2021

Content (vectorDAY5,vectorDAY6) **demonstration of a problem based on the knowledge from last 2 weeks**

Contents for the first semester

Week 4 18/Oct/2021

Content (coordinateDAY1,coordinateDAY2) **polar coordinate (conversion, sketching), demonstration of a problem**

Contents for the first semester

Week 5 25/Oct/2021

Content (coordinateDAY3,coordinateDAY4) **3D Cylindrical coordinates 3D Spherical coordinates, demonstration of a problem**

Contents for the first semester

Week 7 8/Nov/2021

Content (complexnumberDAY1-complexnumberDAY4)
standard form of complex numbers argand diagram modulus form of complex numbers complex conjugate

Contents for the first semester

Week 8 15/Nov/2021

Content (complexnumberDAY5,complexnumberDAY6)
hyperbolic function(cosh,sinh), demonstration of a problem

Contents for the first semester

Week 9 22/Nov/2021

Content (diffsem1DAY1,diffsem1DAY2) **yellow card introduction** `http://staff.cs.manchester.ac.uk/~fumie/Maths/yellowcard.pdf` **, product rule , chain rule, parametric function, second differentiation**

Contents for the first semester

Week 10 29/Nov/2021

Content (diffsem1DAY3,diffsem1DAY4) **partial differentiation of multi-variable function, newton-raphson method, limit (L'Hopital's rule)**

Contents for the first semester

Week 11 6/Dec/2021

Content (integralsem1DAY1,integralsem1DAY2) **yellow card introduction** `http://staff.cs.manchester.ac.uk/~fumie/Maths/yellowcard.pdf` , **Integral by parts, integral by substitution**

Contents for the first semester

Week 12 13/Dec/2021

Content (integralsem1DAY3,integralsem1DAY4) **integral of fraction of polynomials, special technique of integrals**

Contents for the second semester

Week 1 9(12:00Tue),11(15:00Thu)/Feb/2021

Content (integralsem2DAY1,integralsem2DAY2) **Application of integral**

Week 2 16(12:00Tue),17(15:00Wed)/Feb/2021

Content (taylorDAY1,taylorDAY2) **Series, One-dimensional Taylor**

Week 3 23(12:00Tue),24(15:00Wed)/Feb/2021

Content (diffsem2DAY1,diffsem2DAY2) **Multivariable differentiation**

Week 4 2(12:00Tue),3(15:00Wed)/Mar/2021

Content (diffsem2DAY3,integralsem2DAY3) **Gradient of multivariable function, double integral introduction**

Contents for the second semester

Week 5 9(12:00Tue),10(15:00Wed)/Mar/2021

Content (integralsem2DAY4,integralsem2DAY5)
**Multidimensional integral(integralsem2DAY4),
Line integral(integralsem2DAY5)**

Week 6 16(12:00Tue),17(15:00Wed)/Mar/2021

Content (integralsem2DAY6,integralsem2DAY7) **Line
integral(integralsem2DAY6,integralsem2DAY7)**

Week 7 23(12:00Tue),24(15:00Wed)/Mar/2021

Content (taylorDAY3,taylorDAY4) **2D Taylor series
(taylorDAY3,taylorDAY4)**

Contents for the second semester

Week 8 13(12:00Tue),14(15:00Wed)/Apr/2021

Content (diffsem2DAY4,odeDAY1) **2D local minimum and maximum (diffsem2DAY4), 1st order ODE (odeDAY1)**

Week 9 20(12:00Tue),21(15:00Wed)/Apr/2021

Content (odeDAY2,odeDAY3) **1st order ODE (odeDAY2), 2nd order ODE (odeDAY3)**

Week 10 27(12:00Tue),28(15:00Wed)/Apr/2021

Content (odeDAY4,diffsem2DAY5) **2nd order ODE, revision on gradient, directional derivative(diffsem2DAY5)**

Contents for the second semester

Week 11 4(12:00Tue),5(15:00Wed)/May/2021

Content (integralsem2DAY8,taylorDAY5) **revision on line integral (integralsem2DAY8) revision on taylor series (taylorDAY5)**

Week 12 11(12:00Tue),12d3(15:00Wed)/May/2021

Content (diffsem2DAY6,odeDAY5) **revision on 2D local min and max(diffsem2DAY6), revision on ODE(odeDAY5)**