0UNIVERSITAS INDONESIA

FAKULTAS EKONOMI & BISNIS

DEPARTEMEN AKUNTANSI

PROGRAM STUDI S1

SYLLABUS
MATEMATIKA KEUANGAN (FINANCIAL MATHEMATICS)
ECAU 601001
EVEN SEMESTER 2020/2021

No.	Name of Lecturers	E-mail
1	Prof. Dr. Budi Frensidy, S.E., M.Com.	budi.frensidy@office.ui.ac.id
2	Dr. Darminto, S.E., MBA	darminto.mba@ui.ac.id
3	Catur Sasongko, S.E., M.P.P.	catur_sasongko76@yahoo.com
4	Reynardo Nainggolan, S.E., MBA	reynardo.nainggolan@gmail.com
5	Edward Tanujaya, S.E., M.Sc., CA, CGMA	edward_tanujaya@yahoo.com
6	Rachman Untung Budiman, S.E., MBA, CFA	rachman.untung@gmail.com

Subject Code	ECAU 601001
Subject Title	Financial Mathematics
Credit Value	2
Level	First Year
Pre-requisite/ Co-requisite/ Exclusion	-
Role and Purposes	This subject is aimed to give students the financial intelligence and mathematical shrewdness using financial calculator and spreadsheet that are needed to study accounting, finance, and investment. The subject enables students to understand the role of interest rate, discount rate, yield, and return in the financial market as they are used in asset valuation (stocks, bonds, real assets, and other assets), financial planning, and bank products (savings and loans). To achieve asset valuation and financial planning skills and being canny, students will be given the concepts and logics of interest rate vs discount rate, discrete rate vs continuous rate, nominal rate vs effective rate, flat rate vs effective rate, present value vs future value, loan amortization schedule vs sinking fund schedule, and various forms of annuities and perpetuities and their applications in money market and capital market in Indonesia.
Subject Learning Outcomes	Upon completion of the subject, students will be able to: a. Calculate the present value, future value, annuity, period, and the effective interest rate or yield of any loans, savings, and other attractive money-related products offered in the market given the other relevant variables. b. Apply the discounted cash flows and various forms (ordinary, due, deferred, and growing) of annuity and perpetuity equations for asset valuation (stocks, bonds, real assets, and other assets). c. Apply the various forms (ordinary, due, deferred, and growing) of annuity and perpetuity equations for financial planning. d. Construct the schedule related to time value of money namely loan amortization, sinking fund, and bond discount/premium amortization.

	e. Understand the computation of time vs money-weighted return (internal rate of return), stock indices, and margin trading. f. Understand the approaches to determine the exchange rate and the computation of net return of investment in foreign-currency denominated assets.
Subject Synopsis/ Indicative Syllabus	

Week #	Topic	LO	Reading Materials
1	Bunga Sederhana • Nilai Waktu dari Uang • Manipulasi Persamaan Bunga Sederhana • Menghitung Jumlah Hari (akuntansi, tabel nomor urut hari, kalkulator finansial, dan Excel) Tingkat Diskon dan Diskon Tunai • Diskon dan Tingkat Diskon • Manipulasi Persamaan Diskon Sederhana dan Diskon Majemuk • Wesel • Diskon Tunai Bunga Majemuk • Bunga Efektif dan Bunga Nominal • Menghitung Nilai Sekarang • Menghitung Tingkat Bunga dan Jumlah Periode • Aturan 72 • *Continuous Compounding*	a	BF Bab 1, 2, dan 3
2	Anuitas Biasa • Persamaan Anuitas Nilai Sekarang • Menghitung Besar Cicilan • Menghitung Jumlah Periode • Menghitung Tingkat Bunga • Perpetuitas • Persamaan Anuitas Nilai Akan Datang • Menghitung Besar Tabungan Periodik • Menghitung Jumlah Periode Tabungan • Tingkat Bunga *Flat* vs Tingkat Bunga Efektif	a, c	BF Bab 4
3	• Anuitas di Muka untuk Nilai Sekarang • Anuitas di Muka untuk Nilai Akan Datang • Anuitas Ditunda • Anuitas Bertumbuh • Perpetuitas Bertumbuh • Anuitas Variabel • Penurunan Persamaan Perpetuitas • Penurunan Persamaan Anuitas • Penurunan Persamaan Perpetuitas Bertumbuh • Penurunan Persamaan Anuitas Bertumbuh	a, b	BF Bab 5, 6, dan 7

	4	• Amortisasi Utang dengan Anuitas Biasa • Amortisasi Utang dengan Anuitas di Muka • Membuat Tabel Amortisasi Utang dengan Excel • Pembiayaan Kembali Pinjaman • Perencanaan Keuangan untuk Dana Pelunasan • Dana Pelunasan untuk Pelunasan Utang • Perbandingan Metode Amortisasi Utang dan Dana Pelunasan	c, d	BF Bab 8
	5	• Obligasi Berbunga • Penentuan Harga Wajar • Obligasi Tak Berbunga • *Yield* vs Kupon • Obligasi Dapat Ditebus • *Current Yield, Yield to Maturity,* dan *Yield to Call* • Amortisasi Premium dan Diskon Obligasi • Harga Obligasi di Antara Dua Tanggal Pembayaran Bunga • Pencarian *Yield* • Penggunaan Excel dan Kalkulator Finansial untuk Menentukan Harga Wajar Obligasi • Penggunaan Excel dan Kalkulator Finansial untuk Menentukan *Yield* Obligasi	b	BF Bab 10
	Group Assignment (2-3 students)	Kasus Perencanaan Keuangan		
		MID – TERM EXAM		
	6	Saham • Saham yang Tidak Membagikan Dividen • Saham dengan Dividen Tak Berpola • Saham dengan Dividen Konstan • Saham dengan Pertumbuhan Konstan • Saham dengan Pertumbuhan Supernormal • Tingkat Diskonto • Metode Kelipatan Harga *Yield & Return* • *Return* Nominal vs *Return* Riil • *Yield* dalam Pasar Uang • *Return* Berdasarkan Waktu • *Return* Berdasarkan Uang • Aplikasi Pemilihan Ukuran *Return* • Indeks Pasar Saham • Indeks Harga Saham Gabungan (IHSG)	b, e	BF Bab 11 dan 12

UNIVERSITAS INDONESIA
FAKULTAS EKONOMI DAN BISNIS
PROGRAM STUDI S1 AKUNTANSI

	7	NPV vs IRR • *Net Present Value (NPV)* • *Internal Rate of Return (IRR)* • Proyek *Mutually Exclusive* • Nilai Tahunan Ekuivalen • Biaya Tahunan Ekuivalen Kriteria Investasi Lainnya • Periode *Payback* • Periode *Discounted Payback* • Indeks Profitabilitas • *Modified Internal Rate of Return (MIRR)* • *Return* Rata-rata Akuntansi • Kriteria Investasi dalam Praktik	b, e	BF Bab 13 dan 14
	8	Perdagangan Margin • Margin *Call* • Penarikan Dana • *Return* dan Risiko Fasilitas Margin • *Short Selling* • Harga Margin *Call* untuk *Short*	e	BF Bab 15

	9	Valuta Asing
		• Kuotasi Langsung dan Tidak Langsung
		• Kuotasi Amerika dan Eropa
		• Penentuan Nilai Tukar
		  ○ Hukum Satu Harga
		  ○ Paritas Daya Beli
		  ○ Paritas Suku Bunga
		• Apresiasi dan Depresiasi
		• *Spread* Nilai Tukar
		• Investasi dalam Valuta Asing
			f	BF Bab 16

	10	Latihan dengan Excel untuk topik Saham, *Yield & Return, NPV vs IRR,* dan *Regression Analysis*	b, e, f	
		FINAL – TERM EXAM		
Teaching/Learning Methodology	Lectures cover core principles and concepts of the subject syllabus. To enhance students' understanding of relevant concepts, the learning process will be done by: 1. Online Lecturing with Video On 2. Small Group Discussion The students will participate in small group discussion. Each group consists of 2-3 students. The discussion is designed to raise their curiosity as well as to solve some assignments. 3. Individual Exercise After lecturing, students are required to participate actively to solve some questions given by lecturer individually.			

Assessment Method in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weight	a	b	c	d	e	f
Continuous Assessment	**100**						
1. GROUP	**10**						
Individual and Group Assignment (10%)		√		√			
2. INDIVIDUAL	**90**						
Quiz & Homework – Pre Mid Exam (10%)		√	√	√	√		
Quiz & Homework – Post Mid Exam (10%)			√			√	√
Participation (10%)		√	√	√	√	√	√
Mid-Term Exam (30%)		√	√	√	√		
Final Exam (30%)			√			√	√

Student Study Effort Expected

Class contacts	
Lectures	25 Hours
Presentation	5 Hours
Subtotal	**30 hours**
Other student study effort	
Preparation for discussion	5 Hours
Preparation for project/assignment/tests	10 Hours
Tutor	20 Hours
TOTAL	**65 Hours**

Reading List and References

Required Readings:

1. Frensidy, Budi. 2018. Matematika Keuangan edisi 4. Salemba Empat. (BF)

Supplementary Textbook:

1. Kellison, Stephen G. 2008. The Theory of Interest 3rd edition. McGraw-Hill.

UNIVERSITAS INDONESIA
FAKULTAS EKONOMI DAN BISNIS
PROGRAM STUDI S1 AKUNTANSI