Erciyes University, Faculty of Engineering,

Department of Electrical and Electronics Engineering

Course Contents

3. Semester

Term	Autumn				
Code	**Course Title**	**T**	**P**	**K**	**ECTS-Cr**
EM 201	Circuit Analysis I	3	0	3	3
Course Description:					
RC and RL circuits. RLC circuits. Sinusoids and Phasors. Sinusoidal Steady-State. Sinusoidal Steady-State Power. Polyphase Circuits.					

Term	Autumn				
Code	**Course Title**	**T**	**P**	**K**	**ECTS-Cr**
EM 203	Electronic Devices	3	0	3	3
Course Description:					
Semi-conductor materials and conduction mechanism. p and n-type semiconductors. p-n junction. Semiconductor diodes. Diode applications. Bipolar junction. Bipolar transistor characteristics. DC biasing of BJT. JFET operation and biasing. MOSFET operation and biasing. Multi-junction devices and their characteristics: Shocley diode, SCR, Diac,Triac and UJT.					

Term	Autumn				
Code	**Course Title**	**T**	**P**	**K**	**ECTS-Cr**
EM 205	Engineering Mathematics I	3	0	5	5
Course Description:					
Vector analysis. Coordinate systems. Gradient, divergence, rotational divergence and Stokes theorems. Zero identities. Helmholtz theorem.					

Term	Autumn				
Code	**Course Title**	**T**	**P**	**K**	**ECTS-Cr**
EM 209	Introduction to Logic Circuits	3	0	3	3
Course Description:					
Binary number system. Boolean algebra and logic gates. Simplification of Boolean functions.Combinational logic. Adders, decoder and converter circuits. Decoder, encoder, multiplexer, demultiplexer. Sequential logic circuits. Flip-flops, registers, counters and memory units.					

Term	Autumn			
Code	**Course Title**	**T**	**P**	**K**	**ECTS-Cr**
EM 211	Measurement and Analysis Laboratory	0	2	2	2
Course Description:					
Ohm and Kirchoff's Laws and applications. Superposition applications. Thevenin's theorem and applications. Maximum power transfer. Fundamentals of Inductor and capacitor circuits. Passive low-pass filters. Passive high-pass filters. Passive band-pass filters. RLC circuits, resonance. Derivative and integral circuits.					

Term	Autumn			
Code	**Course Title**	**T**	**P**	**K**	**ECTS-Cr**
EM 213	Probability Theory for Engineering	3	0	6	6
Course Description:					
Historical background of probability Set theory, events, sample space, definition and axioms of probability. Compound and conditional probability, independence of events, Bayes theorem, Random variables, probability distribution functions, probability density functions, cumulative distribution functions, mean and variance. Multivariate random variables, correlation, regression. Discrete densities. Laws of Large Numbers, Gaussian probability density and the Central Limit Theorem. Moment function, z transform. Characteristic function, Markoff chains.					

Term	Autumn			
Code	**Course Title**	**T**	**P**	**K**	**ECTS-Cr**
EM 215	Differantial Equations for Engineers	4	0	6	6
Course Description:					
Definition of differential equations. Solution methods of first order differential equations. Full differential equations. Integral multiplier method. Linear systems. Riccati, Bernolli equations. Nonlinear High degree differential Equations. High order linear differential equations.					

4. Semester

Term	Spring			
Code	**Course Title**	**T**	**P**	**K**	**ECTS-Cr**
EM 202	Circuit Analysis II	3	0	6	6
Course Description:					
Magnetically coupled networks: Transformers, auto-transformers, three-phase transformers. Frequency response of electric circuits: Bode plots, resonant circuits, filters. Two-port networks. Application of Laplace transform to circuit analysis					

Term	Spring			
Code	**Course Title**	**T**	**P**	**K**	**ECTS-Cr**
EM 204	Electronic Circuits I	3	0	6	6
Course Description:					
Signal parameters of BJT, re, rp and hybrid circuits, common-emitter (CE). CB and CC amplifiers. Cascade, cascode and Darlington circuits. High frequency response of BJTs. Electrical characteristics of JFET and MOSFET and their applications. Common-source (CS) and CD in low-high frequencies. Frequency response of an amplifier, feedback concept. Stability and oscillations. Sinusoidal oscillators. Feedback amplifier circuits. Large signal amplifiers. A, B and C class and their performance.					

Term	Spring				
Code	**Course Title**	**T**	**P**	**K**	**ECTS-Cr**
EM 212	Numerical Methods	2	0	4	4
Course Description:					

Equation analysis methods (graphic methods, power series,…e.g.). Iteration methods (bisection, Newton, secant, regula-false, fixed point,…e.g.). Polynomials roots (newton, müller). Lineer equations (cramer, gauss Jordan, LU method. Iterations methods…e.g.). Numerical Integral (Newton-cotes formulas). Numerical differential. Interpolation (lagrange interpolation algorithm, Newton algorithm,….e.g.). Curve fitting.

Term	Spring				
Code	**Course Title**	**T**	**P**	**K**	**ECTS-Cr**
EEM 214	Electronic Circuits Laboratory I	0	2	2	2
Course Description:					

Signal parameters of BJT, re, rp and hybrid circuits, common-emitter (CE). CB and CC amplifiers. Cascade, cascode and Darlington circuits. High frequency response of BJTs. Electrical characteristics of JFET and MOSFET and their applications. Common-source (CS) and CD in low-high frequencies. Frequency response of an amplifier, feedback concept. Stability and oscillations. Sinusoidal oscillators. Feedback amplifier circuits. Large signal amplifiers. A, B and C class and their performance.

Term	Spring				
Code	**Course Title**	**T**	**P**	**K**	**ECTS-Cr**
EM 218	Logic Curcuit Design	2	0	4	4
Course Description:					

Register transfer logic; Interregister transfer, Aritmetic logic and shift micro-operations, processor logic design; processor organization, aritmetic logic uniti design of aritmetic logic unit, status register, design of shifter, Control logic design; control organization and design methods, inroduction to microprocomputer.