### COURSE PROFILE

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#### Required / Elective:
- Required

#### Catalog Description:
- Node and mesh analysis, state equations.

#### Pre-requisite:
- EE 221 Circuit Theory I

#### Textbook / Required Material:

#### Course Structure / Schedule:
- (3+0+2) 4 / 7 ECTS

#### Extended Description:

#### Design content:
- Design of frequency selective circuits.
- OPAMP based active filter design.

#### Computer usage:
- Circuit analysis, simulation and design using PSPICE and MATLAB

#### Course Outcomes:

At the conclusion of the course, students will develop an ability to:

- a) Transform a circuit with a sinusoidal source into the frequency domain using phasor concepts and apply the circuit analysis techniques (node-voltages method, mesh-currents method, source transformations, Thevenin and Norton conversions, superposition etc.) to determine the sinusoidal steady state response of a linear circuit [2,6].
- b) Calculate the instantaneous power, average power, reactive power, complex power and power factor in a circuit [2,6].
- c) Calculate the loading requirements for a circuit for maximum power transfer [2,6,7].
- d) Analyze the balanced three-phase circuits [2,6].
- e) Apply the Laplace transform techniques to circuit analysis [2,6].
- f) Calculate the transfer function and impulse response of a circuit using s-domain techniques and know how to apply convolution to determine the response of the circuit[2,6].
- g) Obtain the frequency response of RL, RC and RLC circuits that act as filters [2,5,6].
- h) Design RL, RC and RLC filter circuits [2,5,6,7].
i) Design active filters with OPAMPS that behave as low-pass and high-pass filters to meet specifications of cutoff frequency and passband gain [2,5,6,7].

j) Calculate two-port parameters and analyze terminated two-port circuits [2,6].

k) Use computer programs such as Pspice and Matlab for circuit analysis, simulation and design problems [9,11]

**Level of contribution of course to program outcomes:**
- Strong: [2], [6]
- Average: [5], [7]
- Some: [9], [11]

**Recommended reading:**


**Teaching Methods:**
Pre-readings, lectures, problem sessions/discussions, homework/quiz exercises.

**Assessment Methods:** [Related to course outcomes]
- Quizzes, midterm exams, final exam [a,b,c,d,e,f,g,h,i]
- Homework, project, [g,h,j]
- Class survey (suggested)

**Student Workload:**
- e.g. Preparatory reading 50 hrs
- Lectures 40 hrs
- Problem sessions, discussions 30 hrs
- Midterm exams, Quizzes 7 hrs
- Homeworks 30 hrs
- Projects 15 hrs
- Final Exam 3 hrs
- **TOTAL ..........................** 175 hrs ........................... to match 25 x 7 ECTS

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