RA-EE201: RUBRIC FOR EVALUATING PROGRAM OUTCOME A
"*APPLY KNOWLEDGE OF MATHEMATICS, SCIENCE, AND ENGINEERING*"

Performance Indicator	Exemplary 4	Satisfactory 3	Developing 2	Unsatisfactory 1
Application of Mathematics in Electric Circuit Analysis	Fully able to mathematically analyze electric circuits; always utilizes correct math expressions; excellent ability to utilize calculus and complex variables in circuit analysis.	Reasonably able to mathematically analyze electric circuits; utilizes correct math expressions most of the time; reasonably able to utilize calculus and complex variables in circuit analysis.	Not quite able to mathematically analyze electric circuits; occasionally utilizes incorrect math expressions; to some degree able to utilize calculus and complex variables in circuit analysis.	Poor ability to mathematically analyze electric circuits; utilizes incorrect math expressions much of the time; barely able to utilize calculus and complex variables in circuit analysis.
Application of Scientific and Engineering Principles	Quite able to combine scientific and engineering principles to formulate a circuit model; Quite able to formulate DC, transients, and steady-state circuit models.	Reasonably able to combine scientific and engineering principles to formulate a circuit model; reasonably able to formulate DC, transients, and steady-state circuit models.	Can, to some degree, combine scientific and engineering principles to formulate a circuit model; to some degree able to formulate DC, transients, and steady-state circuit models.	Poor ability to combine scientific and engineering principles to formulate a circuit model; has poor ability to formulate/distinguish between DC, transients, and steady-state circuit models.
Subject Knowledge	Has full command of the course; understands all fundamental circuit laws and their implications; quite able to analyze DC; transient and AC steady-state circuits; utilizes efficient approaches; circuit diagrams are always clearly drawn.	Has reasonable command of the course; understands all fundamental circuit laws and their implications; generally able to analyze DC; transient and AC steady-state circuits; draws reasonably clear circuit diagrams.	Has some command of the course; generally understands fundamental circuit laws; able to analyze DC circuits; but has some problems with analysis of transient and/or AC steady-state circuits; occasionally draws incomplete/erroneous circuit diagrams.	Command of the course is generally poor; unable to analyze electric circuits most of the time; draws incorrect/unclear circuit diagrams most of the time.

Notes:
1) This rubric, RA-EE201, is to be used for program outcome (a) assessment for EE201 *lectures* only.
2) Evaluation of students' performance using this rubric is to be reported using the corresponding excel file **RA-EE201-Section (xxx)-yyy.xls**.
3) Before sending the filled excel file, please rename it using the following naming codes: **xxx** = section number and **yyy** = current semester code.
Example: **RA-EE201 Section (01)-081.xls**.

RA-EE303: RUBRIC FOR EVALUATING PROGRAM OUTCOME A
"APPLY KNOWLEDGE OF MATHEMATICS, SCIENCE, AND ENGINEERING"

Performance Indicator	Exemplary 4	Satisfactory 3	Developing 2	Unsatisfactory 1
Application of Mathematics in Electronics Circuit Analysis	Fully able to mathematically analyze electric circuits; always utilizes correct math expressions; excellent ability to utilize calculus and laplace transform in circuit analysis.	Reasonably able to mathematically analyze electric circuits; utilizes correct math expressions most of the time; reasonably able to utilize calculus and laplace transform in circuit analysis	Not quite able to mathematically analyze electric circuits; occasionally utilizes incorrect math expressions; to some degree able to utilize calculus and laplace transform in circuit analysis	Poor ability to mathematically analyze electric circuits; utilizes incorrect math expressions much of the time; barely able to utilize calculus and laplace transform in circuit analysis
Application of Scientific and Engineering Principles	Quite able to combine scientific and engineering principles to formulate a circuit model; Quite able to formulate DC and small signal circuit models.	Reasonably able to combine scientific and engineering principles to formulate a circuit model; reasonably able to formulate DC and small signal circuit models.	Can, to some degree, combine scientific and engineering principles to formulate a circuit model; to some degree able to formulate DC and small signal circuit models.	Poor ability to combine scientific and engineering principles to formulate a circuit model; has poor ability to formulate/distinguish between DC and small signal circuit models.
Subject Knowledge	Has full command of the course; understands all fundamental circuit laws and their implications; quite able to analyze op-Amp, filter and oscillator circuits; utilizes efficient approaches; circuit diagrams are always clearly drawn.	Has reasonable command of the course; understands all fundamental circuit laws and their implications; generally able to analyze op-Amp, filter and oscillator circuits; draws reasonably clear circuit diagrams.	Has some command of the course; generally understands fundamental circuit laws; but has some problems with analysis of op-Amp, filter or oscillator circuits; occasionally draws incomplete/erroneous circuit diagrams.	Command of the course is generally poor; unable to analyze electric circuits most of the time; draws incorrect/unclear circuit diagrams most of the time.

Notes:
1) This rubric, RA-EE303, is to be used for program outcome (a) assessment for EE303 *lectures* only.
2) Evaluation of students' performance using this rubric is to be reported using the corresponding excel file **RA-EE303-Section (xxx)-yyy.xls**.
3) Before sending the filled excel file, please rename it using the following naming codes: **xxx** = section number and **yyy** = current semester code.
Example: **RA-EE303 Section (01)-081.xls**.

RA-EE340: RUBRIC FOR EVALUATING PROGRAM OUTCOME A
"*APPLY KNOWLEDGE OF MATHEMATICS, SCIENCE, AND ENGINEERING*"

Performance Indicator	Exemplary 4	Satisfactory 3	Developing 2	Unsatisfactory 1
Applying Knowledge of Mathematics in the Analysis of Electric and Magnetic Fields	Fully able to mathematically analyze electric and magnetic fields; always utilizes correct math expressions; excellent ability to utilize calculus, vector analysis and complex variables in electric and magnetic field analysis.	Reasonably able to mathematically analyze electric and magnetic fields; utilizes correct math expressions most of the time; reasonably able to utilize calculus, vector analysis and complex variables in electric and magnetic field analysis.	Not quite able to mathematically analyze electric and magnetic fields; occasionally utilizes incorrect math expressions; to some degree able to utilize calculus, vector analysis and complex variables in electric and magnetic field analysis.	Poor ability to mathematically analyze electric and magnetic fields; utilizes incorrect math expressions much of the time; barely able to utilize calculus, vector analysis and complex variables in electric and magnetic field analysis.
Application of Scientific and Engineering Principles	Fully able to use scientific principles to formulate a model for engineering problems related to the electric and magnetic fields and EM waves.	Reasonably able to use scientific principles to formulate a model for engineering problems related to the electric and magnetic fields and EM waves.	Can, to some degree, use scientific principles to formulate a model for engineering problems related to the electric and magnetic fields and EM waves.	Poor ability to use scientific principles to formulate a model for engineering problems related to the electric and magnetic fields and electromagnetic waves.
Subject Knowledge	Full comprehension of: all theories and fundamental EM laws; boundary conditions and their implications; electric, magnetic and EM fields and waves and their potential engineering applications.	Reasonable comprehension of: all theories and fundamental EM laws; boundary conditions and their implications; electric, magnetic and EM fields and waves and their potential engineering applications.	Partial comprehension of: all theories and fundamental EM laws; boundary conditions and their implications; electric, magnetic and EM fields and waves and their potential engineering applications.	Poor comprehension of: all theories and fundamental EM laws; boundary conditions and their implications; electric, magnetic and EM fields and waves and their potential engineering applications.

Notes:
1) This rubric, RA-EE340, is to be used for program outcome (a) assessment for EE340 *lectures* only.
2) Evaluation of students' performance using this rubric is to be reported using the corresponding excel file **RA-EE340-Section (xxx)-yyy.xls**.
3) Before sending the filled excel file, please rename it using the following naming codes: **xxx** = section number and **yyy** = current semester code.
Example: **RA-EE340-Section (01)-081.xls**.
4) Evaluation of students' performance using this rubric is based generally on: H.W. assignments, quizzes, major exams, design project, and *especially* the final exam.