**Self-Assessment Form**

**Instructions for Applicants**

**General:**

1. You must use your WES course-by-course (CxC) assessment to complete this form.
   1. When completing the self-assessment form, use the Bachelor’s degree courses.
   2. Only use your Master’s or Ph.D. in engineering **if they are necessary**. If you use too many graduate courses, the degree will **not be** eligible to use for waiving confirmatory exams.
2. Only complete column C2. Do not enter any information in column C3 or C4. If you do, it will be deleted.
   1. Enter the year, course name, credits and grade from the WES assessment Course-by-Course Analysis.
   2. Both the Basic Studies and Discipline Specific Syllabus Tables contain compulsory subjects and elective subjects. Include courses that cover any part of the syllabus even if you have more than the minimum number in the elective sections.
   3. Colour code the content in column C1 by highlighting it the same colour as the corresponding course you entered in column C2.

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| --- | --- | --- | --- | --- |
| **C1**  **APEGS Syllabus** | **C2**  **Self-Assessment (by applicant)** | | **C3**  **for Staff only** | **C4**  **for ARC only** |
| **COMPULSORY SUBJECTS**  **(all required)** | **WES assessment: year, course name, credits and grade.** | **Program Syllabus: page number, course name** | **Preliminary Review** | **Final Review** |
| **20-BS-A1 Mathematics:** Vector and Linear Algebra: Applications involving matrix algebra, determinants, eigenvalues and eigenvectors, vector functions and operations, orthogonal curvilinear coordinates. Calculus: first and second order linear ordinary differential equations, series solutions of ordinary differential equations, applications of partial derivatives, Lagrange multipliers, multiple integrals, line and surface integrals, integral theorems (Gauss, Green, Stokes). Power series. | 2004-2005: Applied Mathematics I, 2 credits. Grade: B  2004-2005: Applied Mathematics II, 2 credits. Grade: B  2005-2006: Applied Mathematics III,2 credits. Grade: B |  |  |  |

1. Once you have completed column C2, submit the **Word document** to [documents-academicreview@apegs.ca](mailto:documents-academicreview@apegs.ca).

**Program Syllabus (only required if requested by APEGS):**

1. Provide the program syllabus in a PDF document through the Contact Us page on the APEGS website.
2. If the course names in the program syllabus are different than those in your WES assessment you must provide an explanation of how they correlate in the program syllabus column of the form.
3. Use the page number of the PDF document of the program syllabus (not the original page number).

***By submitting this self-assessment, I declare that I have read and followed the instructions and that this self-assessment is accurate and complete, to the best of my knowledge and ability, and that I have provided all the relevant information that I have available to me. I understand that if information is incorrect or missing, that it may delay my application and may result in the assignment of academic deficiencies.***

**Self-Assessment Form – Electrical Engineering**

Use the information provided on the WES assessment to complete this information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Applicant Information:** | **Last Name, First Name** | | | |
|  | | | |
| **APEGS File #** |  | | | |
| **Institution Information** | | | | |
| **Credential** | **Awarded By** | **Major/Specialization** | **Year** | **Country** |
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**SELF-ASSESSMENT – FOR APPLICANT TO COMPLETE**

**BASIC STUDIES SYLLABUS TABLE**

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| --- | --- | --- | --- | --- |
| **C1**  **APEGS Syllabus** | **C2**  **Self-Assessment (by applicant)** | | **C3**  **for Staff only** | **C4**  **for ARC only** |
| **COMPULSORY SUBJECTS**  **(all required)** | **WES assessment: year, course name, credits and grade.** | **Program Syllabus: page number, course name** | **Preliminary Review** | **Final Review** |
| **20-BS-A1 Mathematics:** Vector and Linear Algebra: Applications involving matrix algebra, determinants, eigenvalues and eigenvectors, vector functions and operations, orthogonal curvilinear coordinates. Calculus: first and second order linear ordinary differential equations, series solutions of ordinary differential equations, applications of partial derivatives, Lagrange multipliers, multiple integrals, line and surface integrals, integral theorems (Gauss, Green, Stokes). Power series. |  |  |  |  |
| **20-BS-A2 Probability and Statistics:** Concepts of probability, events and populations, probability theorems, concept of a random variable, continuous and discrete random variables, probability distributions, distributions of functions of a random variable, sampling and statistical estimation theory, hypothesis testing, simple regression analysis. |  |  |  |  |
| **20-BS-A3 Computation Methods:** Use of computers for numerical solution of engineering problems, including techniques involving high-level languages and other computational tools (e.g., spreadsheets). Data representation, approximations and errors. |  |  |  |  |
| **20-BS-A4 Engineering Design Process:** Design process and methods. Project management & teamwork. Requirements and function analysis in design. Conceptual design and testing. Concept evaluation design factors such as: cost, quality, manufacturability, safety, etc. Systems modelling & design detail. |  |  |  |  |
| **20-BS-B1 Statics and Dynamics:** Force vectors in two- and three-dimensions, equilibrium of a particle in two- and three-dimensions; moments and couples; equilibrium of rigid bodies in two- and three-dimensions; centroids, centres of gravity; second moment of area, moment of inertia; truss, frame and cable static analysis; friction. Planar kinematics of particles and rigid bodies; planar kinetics of particles and rigid bodies; work and energy, impulse, and momentum of particles and rigid bodies. |  |  |  |  |
| **20-BS-B2 Electric Circuits and Power:** Current, voltage, Ohm’s law, Kirchoff’s voltage and current laws, power; DC circuits, network theorems, network analysis; simple transients, AC circuits. Impedance concept, resonance; application of phasors and complex algebra in steady-state response; application of Laplace transforms; simple magnetic circuits; basic concepts and performance characteristics of transformers; an introduction to diodes and transistors; rectification and filtering; simple logic circuits. |  |  |  |  |
| **20-BS-B5 Digital Logic Circuits:** Boolean algebra, truth tables and minimization techniques. Logic devices, combinational logic, encoders, decoders and shift registers. Design of asynchronous circuits and synchronous circuits, arithmetic circuits and finite state machines together with clock and timing considerations. Introduction to programmable logic and computer-aided design and simulation tools for digital system design. |  |  |  |  |
| **20-BS-B13 Advanced Mathematics:** Solutions of differential equations, boundary value problems and orthogonal functions, Fourier series, complex variable analysis. |  |  |  |  |
| **C1**  **APEGS Syllabus** | **C2**  **Self-Assessment (by applicant)** | | **C3**  **for Staff only** | **C4**  **for ARC only** |
| **ELECTIVE SUBJECTS**  (minimum of two required) | **WES assessment: year, course name, credits and grade.** | **Program Syllabus: page number, course name** | **Preliminary Review** | **Final Review** |
| **20-BS-B3 Mechanics of Materials:** Definitions of normal stress, shearing stress, normal strain, shearing strain; shear force and bending moment diagrams; members subjected to axial loading; members subjected to torsional loading; compound stresses, Mohr's circle; deformation of flexural and torsional members; failure theories; elastic and inelastic strength criteria; columns. |  |  |  |  |
| **20-BS-B4 Mechanics of Fluids:** Fluid characteristics, dimensions and units, flow properties, and fluid properties; the fundamentals of fluid statics, engineering applications of fluid statics; the one-dimensional equations of continuity, momentum, and energy; laminar and turbulent flow, flow separation, drag and lift on immersed objects; wall friction and minor losses in closed conduit flow; flow of incompressible and compressible fluids in pipes; dimensional analysis and similitude; flow measurement methods. |  |  |  |  |
| **20-BS-B6 Basic Electromagnetics:** Introduction to the fundamental electromagnetic fields and forces used in engineering, including fundamental laws, principles, and equations developed by Gauss, Faraday, Ampere, Kirchoff, Maxwell, leading to electromagnetic design and applications in engineering, such as for capacitors, dielectrics, and magnetic devices. |  |  |  |  |
| **20-BS-B7 Thermodynamics :** Basic concepts and definitions, energy concepts and the first law of thermodynamics, properties of pure substances, closed systems, open systems, the second law of thermodynamics, enthalpy, entropy, exergy, gas power cycles, vapor and combined power cycles, refrigeration cycles. |  |  |  |  |
| **20-BS-B8 Properties of Materials:** Properties of materials for mechanical, thermal and electrical applications. Atomic bonding, solid solutions, crystallisation. Equilibrium phase diagrams, applications to steel and aluminium alloys, heat treatments. Structure and special properties of polymers and ceramic materials. General characteristics of metallic composites, polymeric composites and concrete. Introduction to materials in hostile environments: corrosion, creep at high temperature, refractory materials, subnormal temperature brittle fracture. |  |  |  |  |
| **20-BS-B12 Engineering Graphics:** Engineering drawing: Orthographic sketching. Standard orthographic projection. Principal views, selection and positioning of views. Visualization. Conventions and practices. First and second auxiliary views. Basic descriptive geometry. Section views, types, hatching conventions. Basic dimensioning requirements. Tolerance for fits and geometry control. Detail drawings and assembly drawings, other drawings and documents used in an engineering organization. Bill of materials. Fasteners and welds. |  |  |  |  |

**DISCIPINE SPECIFIC SYLLABUS TABLE**

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| **C1**  **APEGS Syllabus** | **C2**  **Self-Assessment (by applicant)** | | | **C3**  **for Staff only** | **C4**  **for ARC only** |
| **COMPULSORY SUBJECTS**  **(all required)** | **WES assessment: year, course name, credits and grade.** | | **Program Syllabus: page number, course name** | **Preliminary Review** | **Final Review** |
| **16-Elec-A1 Circuits:** Electric circuit components: lumped parameter models. Nodal and mesh analysis of linear, passive circuits; equivalent networks. Steady state analysis of lumped parameter, time- invariant circuits: differential equation formulation, sinusoidal inputs, frequency response, impulse response, and transfer functions. Laplace transform analysis and circuit transient response. Two-port circuit models and analysis. | |  |  |  |  |
| **16-Elec-A2 Systems and Control:** System models, impulse response functions, and transfer functions. System input-output and convolution. Root locus analysis and design. Feedback and stability: Bode diagrams.  Nyquist criterion, frequency domain design. State variable representation. Simple PID control systems. Systems with delay. | |  |  |  |  |
| **16-Elec-A3 Signals and Communications:** Analysis of continuous-time signals: Fourier series and Fourier transform; magnitude, phase, and power spectra. Analysis of discrete-time signals: Nyquist sampling theorem; the Z- transform. Analog communication systems: amplitude and angle modulation and demodulation. Digital communication systems: digital modulation; and demodulation techniques. | |  |  |  |  |
| **16-Elec-A4 Digital Systems and Computers:** Combinational, sequential, and synchronous logic circuits. Register level design of digital systems. Computer arithmetic, central processing unit, memory systems and peripherals. Embedded and higher-level (e.g. C) programming, interrupts, and interfacing and communication. Computer architecture. | |  |  |  |  |
| **16-Elec-A5 Electronics:** Semiconductor devices; diodes and thyristors. Bipolar and field effect transistors as linear devices and switches. Bias circuits, basic amplifiers, small-signal equivalent circuits, transfer functions, and frequency response. Operational amplifiers and comparators. Digital integrated circuits and logic families: CMOS. | |  |  |  |  |
| **16-Elec-A6 Power Systems and Machines:** Magnetic circuits and transformers. Wye and delta connected three-phase systems. Generation, transmission, and distribution of electric power. Three-phase transformers. AC and DC machines. Three-phase synchronous machines and three phase induction motors. | |  |  |  |  |
| **16-Elec-A7 Electromagnetics:** Field concepts. Maxwell's equations, integral and differential forms. Free space and guided wave propagation, transmission lines. Radiation from current elements. | |  |  |  |  |
| **C1**  **APEGS Syllabus** | **C2**  **Self-Assessment (by applicant)** | | | **C3**  **for Staff only** | **C4**  **for ARC only** |
| **ELECTIVE SUBJECTS**  (minimum of two required) | **WES assessment: year, course name, credits and grade.** | | **Program Syllabus: page number, course name** | **Preliminary Review** | **Final Review** |
| **16-Elec-B1 Digital Signal Processing:** Discrete-time signals and systems: system input-output and convolution, Z-transform and transfer functions. Discrete-time Fourier transform (DFT) and Fast Fourier transform (FFT). Design of finite impulse response (FIR) and infinite impulse response (IIR) filters. DSP implementation considerations. | |  |  |  |  |
| **16-Elec-B2 Advanced Control Systems:** Modelling of engineering systems; state variables and transfer function representations. Analytical and numerical solutions of state variable equations. Observability, controllability, stability; classical design, stabilization by pole assignment. Systems with noise. Computer control, discrete systems. System identification; least squares. | |  |  |  |  |
| **16-Elec-B3 Digital Communications Systems:** A/D conversion, source coding; signal sets, line codes, modulation, optimal reception, demodulation, performance in noisy channels, error detecting and correcting codes. Radio communications; link analysis and performance, terrestrial and satellite communications. | |  |  |  |  |
| **16-Elec-B4 Information Technology Networks:** Layered architecture, circuit-switching networks, peer-to-peer protocols and data link layer, medium access control protocols, local area networks, packet-switching networks, cellular networks, and wireless networks. | |  |  |  |  |
| **16-Elec-B5 Advanced Electronics:** Device models: circuit behaviour, high frequency, and feedback. Multi-stage amplifiers, oscillators, current mode op-amps, non-linear circuits. Power amplifiers and linear regulators. Instrumentation: differential amps, optical isolators, and analog-digital and digital-analog converters. | |  |  |  |  |
| **16-Elec-B6 Integrated Circuit Engineering:** Integrated Circuit Design: MOS circuit design methods; specification; use of CAD design tools. Non-ideal effects. Mask level layout. Integrated Circuit Fabrication: basic knowledge of IC processing techniques. Digital and analog IC's: basic building blocks. Design considerations for submicron CMOS and bipolar devices. | |  |  |  |  |
| **16-Elec-B7 Power Systems Engineering:** Power system representation and analysis. Components: power transmission lines, transformers, synchronous machines. Distribution: power flow, operations, and control. Fault analysis and power system protection. System stability. | |  |  |  |  |
| **16-Elec-B8 Power Electronics and Drives:** Principles and modelling of electric machines: dc machines, induction machines, and synchronous machines. Power electronic devices and converters: choppers, inverters, cycloconverters, and switched power supplies. Electric drives: torque and speed control, and field and vector oriented control techniques. | |  |  |  |  |
| **16-Elec-B9 Electromagnetic Field, Transmission Lines, Antennas, and Radiation:** Field radiation equations. Distributed circuits: steady-state transmission line equations; impedance transformation, Smith charts, matching. Transients. Coaxial lines, waveguides. Antennas: infinitesimal elements, linear antennas, radiation resistance, antenna patterns, gain. | |  |  |  |  |
| **16-Elec-B10 Electro-Optical Engineering:** Optical transmission: waveguide modes, fibre optic propagation characteristics. Optoelectronics: lasers, sources and detectors, couplers, modulators, guided wave devices. Applications. | |  |  |  |  |