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P97. Science Convergence Approach towards Education for Advanced Electronic Materials

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Modern materials science and electronic technologies no longer have a sharp boundary. As an example, microelectronics/nanoelectronics device structure is made because of 3D functionalization and assembling of different materials. The properties of the materials/devices are achieved because of its constituent inorganic, organic, and biological components. Therefore convergence of sciences disciplines, as proposed by the Institute of Advanced Sciences Convergence, could be employed to design and fabricate electronic circuits.

Following Moore's law, rate of electronics advancement occurs every 18 months [1]. The process of designing and delivering curriculum takes much longer ranging from 5-10 years; thus education lags technological progress in advanced electronics. As a result, educators are challenged to anticipate and allocate Research and Design aspects of the curriculum to ensure that a student in engineering and scientific disciplines graduates with relevant skills and knowledge. There is a need for an education paradigm shift in such a way that undergraduates are prepared allowing for a better transition to an advanced electronic materials curriculum. Two-pronged approaches for electronic materials curriculum re-design are suggested. First - to eliminate bureaucratic barriers to curriculum design and acceptance/accreditation processes. Second - to shift fundamental physics, chemistry, and calculus courses from the first-year undergraduate curriculum to the last-year secondary school curriculum. This allows the first year university student to rapidly advance into an undergraduate curriculum that integrates advanced sciences convergence. The possibilities and logistics of these approaches, along with other issues will be discussed.

Keywords: materials for electronics, education, science convergence.

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