***COURSE AND MODULE OUTLINES***

The following table illustrates course and module outlines for all three courses, to be refined in Year I. Although tentative course titles have been identified as examples, actual instructional content will be determined by the writing teams and developed according to the Wiggins and McTighe Understanding by Design methodology.

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| **Table 2. Draft ATEP Course Topical Outlines (to be refined by development teams)****HS modules can be used as replacement curriculum in science, engineering and technology education, and CTE** |
| **Biotechnology** | **Materials and Manufacturing** | **Information and Communication (ICT)** |
| **Module A – The World of Biotechnology**Biotechnological ChangeApplying BiotechnologyCore Skills for BiotechnologyRaw Materials for Biotechnology: DNA and ProteinsBiotechnology as Engineering ScienceProduct DevelopmentBioprocessingAgricultural BiotechnologyMedicine and BiotechnologyElectronics and BiotechnologyThe Future of BiotechnologyCareers in Related Fields**Module B – Chemical Technology**Defining Chemical TechnologyCommodities, Polymers, and Feedstock ChemicalsSpecialty, Fine Chemicals, and PharmaceuticalsCurrent and Future Chemical Energy SourcesCareers in Related Fields**Module C – Agricultural Technology**From the Green Revolution to the Gene RevolutionAgricultural Engineering Problems and SolutionsFood Processing and PreservationCareers in Related Fields**Module D – Medical Technology**History of Medical TechnologyDiagnosis, Therapeutics, RehabilitationScientific and Technological Medical ResearchTechnological Advances Applied to Medical TechnologyCareers in Related Fields | **Module A – Properties and Processing Materials**Types of MaterialsProperties of MaterialsStrength of MaterialsMaterials Science and EngineeringProcessing MaterialsFactors in Selecting MaterialsCareers in Related Fields**Module B – Manufacturing Systems**Manufacturing as a SystemCustom and Mass ProductionQuality and Quality SystemsAutomated ManufacturingNanotechnology Manufacturing – Top Down, Bottom UpSafety and ErgonomicsCareers in Related Fields**Module C – Automation and Control Systems**Human-Machine InterfacesCAD-CAMRobotics and CIM SystemsSolid ModelingStatistical Process ControlNext Generation ManufacturingCareers in Related Fields**Module D – Design for Manufacture**Design for ManufacturabilityDesign for SustainabilityChanges in Manufacturing Methods and ProcessesSupervisory and Managerial Procedures Used in IndustryManufacturing **–** A Global EnterpriseDisposability, Environmental ImpactCareers in Related Fields | **Module A – Electronic and Computer-Based Communication**Understanding Communication and Computer SystemsDigital Logic, Memory, ArchitectureDigital Game TechnologyCellular Technology/TelecomSatellite Communication and GPSSociety and ICTCareers in Related Fields**Module B – Data Networking and Communication**Networking Technologies and Cloud Computing LANs, WANs, Networking DevicesIP AddressingP to P and Client/Server NetworkingNetwork Operating System SoftwareFile SharingCopyright LawCareers in Related Fields**Module C – System Connectivity**TCP/IP OSI ModelAddress Resolution ProtocolServer Performance ConsiderationsNetwork Architecture and TopologyCareers in Related Fields**Module D – Behind the Internet Connection**User Needs, Requirements, ExpectationsWireless TechnologiesMobile Computing DevicesSocial Networking Tools and NetworksVoIP (video and image) as “game changers”FirewallsSecuring the NetworkEmerging Technologies in ICTCareers in Related Fields |