***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.

|  |  |  |
| --- | --- | --- |
| **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 Change  Applying Biotechnology  Core Skills for Biotechnology  Raw Materials for Biotechnology:  DNA and Proteins  Biotechnology as Engineering Science  Product Development  Bioprocessing  Agricultural Biotechnology  Medicine and Biotechnology  Electronics and Biotechnology  The Future of Biotechnology  Careers in Related Fields  **Module B – Chemical Technology**  Defining Chemical Technology  Commodities, Polymers, and Feedstock Chemicals  Specialty, Fine Chemicals, and Pharmaceuticals  Current and Future Chemical Energy Sources  Careers in Related Fields  **Module C – Agricultural Technology**  From the Green Revolution to the Gene Revolution  Agricultural Engineering Problems and Solutions  Food Processing and Preservation  Careers in Related Fields  **Module D – Medical Technology**  History of Medical Technology  Diagnosis, Therapeutics, Rehabilitation  Scientific and Technological Medical Research  Technological Advances Applied to Medical Technology  Careers in Related Fields | **Module A – Properties and Processing Materials**  Types of Materials  Properties of Materials  Strength of Materials  Materials Science and Engineering  Processing Materials  Factors in Selecting Materials  Careers in Related Fields  **Module B – Manufacturing Systems**  Manufacturing as a System  Custom and Mass Production  Quality and Quality Systems  Automated Manufacturing  Nanotechnology Manufacturing – Top Down, Bottom Up  Safety and Ergonomics  Careers in Related Fields  **Module C – Automation and Control Systems**  Human-Machine Interfaces  CAD-CAM  Robotics and CIM Systems  Solid Modeling  Statistical Process Control  Next Generation Manufacturing  Careers in Related Fields  **Module D – Design for Manufacture**  Design for Manufacturability  Design for Sustainability  Changes in Manufacturing Methods and Processes  Supervisory and Managerial Procedures Used in Industry  Manufacturing **–** A Global Enterprise  Disposability, Environmental Impact  Careers in Related Fields | **Module A – Electronic and Computer-Based Communication**  Understanding Communication and Computer Systems  Digital Logic, Memory, Architecture  Digital Game Technology  Cellular Technology/Telecom  Satellite Communication and GPS  Society and ICT  Careers in Related Fields  **Module B – Data Networking and Communication**  Networking Technologies and Cloud Computing  LANs, WANs, Networking Devices  IP Addressing  P to P and Client/Server Networking  Network Operating System Software  File Sharing  Copyright Law  Careers in Related Fields  **Module C – System Connectivity**  TCP/IP  OSI Model  Address Resolution Protocol  Server Performance Considerations  Network Architecture and Topology  Careers in Related Fields  **Module D – Behind the Internet Connection**  User Needs, Requirements, Expectations  Wireless Technologies  Mobile Computing Devices  Social Networking Tools and Networks  VoIP (video and image) as “game changers”  Firewalls  Securing the Network  Emerging Technologies in ICT  Careers in Related Fields |