8.6 Digital filter: Implementation of digital filter, Applications of FFT algorithms. (AExE0806)

9. Wireless and Telecommunication System (AExE09)

9.1 Telecommunication and its evolution: History of telecommunication. Generations and future trends. Telecommunication transmission media. (AExE0901)

9.2 Cellular network: Free space propagation model, Reflection, diffraction and scattering; small scale multipath propagation and fading model, Rayleigh fading model, cellular concept frequency reuse Strategies Channel assignment and handover process, coverage and capacity in cellular system, cell splitting and cell sectoring concept. (AExE0902)

9.3 Signal and system: Equalization and diversity techniques, Spread Spectrum modulation, Multiple Access techniques. (AExE0903)

9.4 Switching systems: Digital and analog switching, soft switching, Routing and Signaling. (AExE0904)

9.5 Traffic engineering: Tele traffic parameters (busy hour, grade of service, service levels, and traffic intensity). Traffic routing in wireless networks, common channel signaling, integrated services digital networks. Packet vs circuit switching for PCN, protocol for network access. (AExE0905)

9.6 Rules and regulations: International Telecommunication Union (ITU), Nepal Telecommunication Authority (NTA), Ministry of Communication and Information, National frequency allocation plan, Radio act. (AExE0906)

10. Project Planning, Design and Implementation (AALL10)

10.1 Engineering drawings and its concepts: Fundamentals of standard drawing sheets, dimensions, scale, line diagram, orthographic projection, isometric projection/view, pictorial views, and sectional drawing. (AALL1001)

10.2 Engineering Economics: understanding of project cash flow; discount rate, interest and time value of money; basic methodologies for engineering economics analysis (Discounted Payback Period, NPV, IRR & MARR); comparison of alternatives, depreciation system and taxation system in Nepal. (AALL1002)

10.3 Project planning and scheduling: project classifications; project life cycle phases; project planning process; project scheduling (bar chart, CPM, PERT); resources levelling and smoothing; monitoring/evaluation/controlling. (AALL1003)

10.4 Project management: Information system; project risk analysis and management; project financing, tender and its process, and contract management. (AALL1004)

10.5 Engineering professional practice: Environment and society; professional ethics; regulatory environment; contemporary issues/problems in engineering; occupational health and safety; roles/responsibilities of Nepal Engineers Association (NEA). (AALL1005)

10.6 Engineering Regulatory Body: Nepal Engineering Council (Acts & Regulations). (AALL1006)

3. Programming Language and Its Applications (ACtE03)

3.1 Introduction to C programming: C Tokens, Operators, Formatted/Unformatted Input/output, Control Statements, Looping, User-defined functions, Recursive functions, Array (1-D, 2-D, Multi-dimensional), and String manipulations. (ACtE0301)

3.2 Pointers, structure and data files in C programming: Pointer Arithmetic, Pointer and array, passing pointer to function, Structure vs Union, array of structure, passing structure to function, structure and pointer, Input/output operations on files, and Sequential and Random Access to File. (ACtE0302)

3.3 C++ language constructs with objects and classes: Namespace, Function Overloading, Inline functions, Default Argument, Pass/Return by reference, introduction to Class and object, Access Specifiers, Objects and the Member Access, Defining Member Function, Constructor and its type, and Destructor, Dynamic memory allocation for objects and object array, this Pointer, static Data Member and static Function, Constant Member Functions and Constant Objects, Friend Function and Friend Classes. (ACtE0303)

3.4 Features of object-oriented programming: Operator overloading (unary, binary), data conversion, Inheritance (single, multiple, multilevel, hybrid, multipath), constructor/destructor in single/multilevel inheritances. (ACtE0304)

3.5 Pure virtual function and file handling: Virtual function, dynamic binding, defining opening and closing a file, Input / Output operations on files, Error handling during input/output operations, Stream Class Hierarchy for Console Input /Output, Unformatted Input /Output Formatted Input /Output with ios Member functions and Flags, Formatting with Manipulators. (ACtE0305)

3.6 Generic programming and exception handling: Function Template, Overloading Function Template, Class Template, Function Definition of Class Template, Standard Template Library (Containers, Algorithms, Iterators), Exception Handling Constructs (try, catch, throw), Multiple Exception Handling, Rethrowing Exception, Catching All Exceptions, Exception with Arguments, Exceptions Specification for Function, Handling Uncaught and Unexpected Exceptions. (ACtE0306)

4. Computer Organization and Embedded System (ACtE04)

4.1 Control and central processing units: Control Memory, addressing sequencing, Computer configuration, Microinstruction Format, Design of control unit, CPU Structure and Function, Arithmetic and logic Unit, Instruction formats, addressing modes, Data transfer and manipulation, RISC and CISC Pipelining parallel processing. (ACtE0401)

4.2 Computer arithmetic and memory system: Arithmetic and Logical operation, The Memory Hierarchy, Internal and External memory, Cache memory principles, Elements of Cache design - Cache size, Mapping function, Replacement algorithm, write policy, Number of caches, Memory Write Ability and Storage Permanence, Composing Memory. (ACtE0402)

4.3 Input-Output organization and multiprocessor: Peripheral devices, I/O modules Input-output interface, Modes of transfer Direct Memory access, Characteristics of multiprocessors, Interconnection Structure, Inter-processor Communication and synchronization. (ACtE0403)

4.4 Hardware-Software design issues on embedded system: Embedded Systems overview, Classification of Embedded Systems. Custom Single-Purpose Processor Design, Optimizing Custom Single-Purpose Processors, Basic Architecture, Operation and Programmer's View, Development Environment. Application-Specific Instruction-Set Processors. (ACtE0404)

4.5 Real-Time operating and control system: Operating System Basics, Task, Process, and Threads, Multiprocessing and Multitasking, Task Scheduling, Task Synchronization, Device Drivers, Open-loop and Close-Loop control System overview, Control. (ACtE0405)

4.6 Hardware descripts language and IC technology: VHDL Overview, Overflow and data

8.6 Digital filter: Implementation of digital filter, Applications of FFT algorithms. (AExE0806)

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