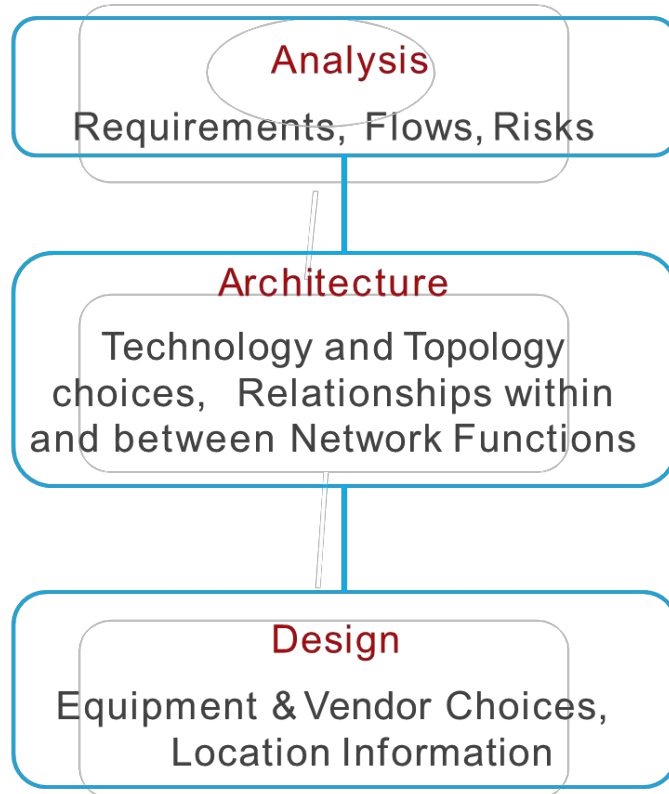


Week 1

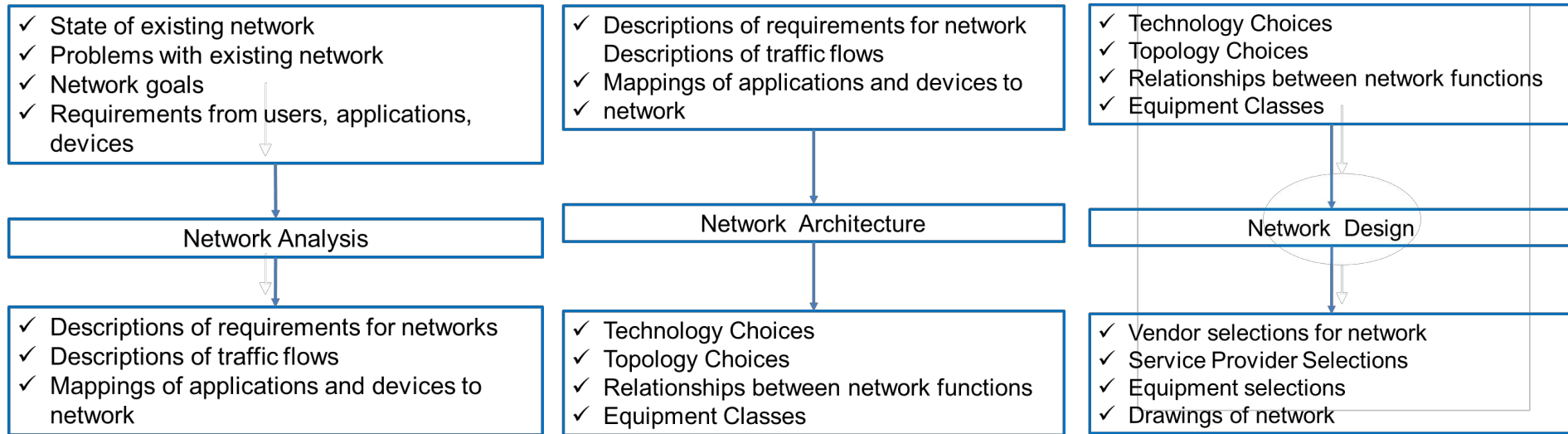
❖ Introduction

- Subject Overview
- Overview of Strategic Network Design

Week 1



Week 1



Week 2 – Fundamentals of Network

- ❖ Network Elements
- ❖ Network Categories
- ❖ Network Protocols
- ❖ Network Topology
- ❖ Network Addressing
- ❖ Network Performance

Week 2 – Fundamentals of Network

- Types of networking devices: hub, switch, router, bridge, gateway, modem, repeater, or access point.
- Transmission Media
- Computer network models
- Network categories, LAN, MAN, WAN
- Network Performance Metrics

Week 3 – Network Design Methodology

- ❖ Network Design Methodology

- Hierarchical model
- PPDIOO
- Eight Steps Design Method

- ❖ Network Design Process

- ❖ Strategic Network Plan

- ❖ Six Tips for Strategic Planning

- ❖ Ten Pitfalls of Strategic Planning

- ❖ Factors in Selecting Strategies

- ❖ Planning team

- Who should be involved in planning?

Week 4 – Requirement Analysis

- ❖ Gathering and Listing Requirements
- ❖ Gathering Initial Conditions
- ❖ User Requirements and Performance
- ❖ Service metrics
- ❖ Characterizing Behavior
- ❖ RMA Requirements
- ❖ Application Characteristics and Additional Requirements
- ❖ Procedures and Documentation

Week 5a – Requirements Analysis: Recap

- ❖ Requirements Mapping
- ❖ Requirements Specification
- ❖ Best effort Predictable and Guaranteed Performance
- ❖ Flow specification

Week 5b – Network Architecture

- ❖ Architecture and Design
- ❖ Component Architectures
- ❖ Reference Architectures
- ❖ Architectural models
 - Topological
 - Flow-based
 - Functional

Week 6 – Addressing and Forwarding Techniques - introduction

- ❖ Definitions
- ❖ Addressing Fundamentals
- ❖ Routing Fundamentals

Week 7a – Network Addressing

- ❖ Addressing Fundamentals
- ❖ IPv4 address types
- ❖ Subnetting an IPv4 Network

Week 7b – Network Routing

- ❖ Routing Fundamentals
- ❖ Routing Mechanism
- ❖ Routing Strategies
- ❖ Evaluating Routing Protocols
- ❖ Choosing and Applying Routing Protocols
- ❖ Architectural Considerations

Week 8 – Security and Privacy Architecture

- ❖ Basic Concepts and Mechanisms of Security
- ❖ Three classic security considerations
- ❖ What does it cover?
- ❖ Developing a Security and Privacy Plan
- ❖ Security and Privacy Administration
- ❖ Policies and Procedures
- ❖ Policies Areas
- ❖ Security and Privacy Mechanisms
- ❖ Architectural Considerations

Week 9a – Network Design

- ❖ Design Process
- ❖ Vendor, Equipment, and service-provider evaluations
 - Developing goals
 - Developing criteria for technology evaluations
 - An architectural approach to network design
 - Network architecture design elements
 - Guidelines and constraints
 - Making technology choices for the design
- ❖ Network layout
- ❖ Design traceability
- ❖ Design metrics

Week 9b – Network Design

- ❖ Four Guiding Principles
- ❖ Creating Design Team

Week 10 – Performance Architecture

- ❖ Background
- ❖ Definition
- ❖ Developing Goals for Performance
- ❖ Performance Mechanisms
 - Quality of Service
 - Resource control
 - Service Level Agreements
 - Policies
- ❖ Architectural Considerations

Week 11 – Network Management Architecture

❖ Network Management Architectures

❖ Network Devices and Characteristics

❖ Network Management Mechanisms

- Monitoring Mechanisms
- Instrumentation mechanisms
- Configuration mechanisms

❖ Architectural Considerations

- In-band and Out-of-band management
- Centralized, distributed, and hierarchical management
- Scaling network management traffic
- Checks and balances
- Management of Network Management Data
- MIB selection
- Internal relationships
- External relationships

Week 12 – Advanced Networking Technologies

- ❖ SDN
- ❖ SDN and Big Data
- ❖ NFV
- ❖ Machine Learning

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Thank you
Q&A ?

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