Musings on Analysis
Calendar description

Introduction to developing large-scale, quality software, from analysis of requirements, through design, implementation, and testing. Introduction to design for non-functional properties of software. Emphasis on individual skills.
Problem solving

Understanding the problem

Devising a plan

Carrying out the plan

Look back

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\begin{array}{ccc}
5 & 3 & 7 \\
6 & 1 & 9 \\
9 & 3 & \ \\
8 & 5 & 9 \\
7 & 8 & 3 \\
4 & 2 & 6 \\
6 & 1 & 3 \\
2 & 4 & 1 \\
3 & 2 & 8 \\
\end{array}
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Analysis

A systematic approach to problem solving. Complex problems are made simpler by separating them into more understandable elements.

Design

The act of working out the form of something.
Steps to analysis

What do I need to know?
How do I get that information?
How do I use that information?
Repeat
"I growl when I'm pleased, and wag my tail when I'm angry."
Let’s build a Mac application to allow people to keep track of their movies, books and video games.

**Goal:** Create the “The greatest media cataloging software in the world”
Analysis
Answering: what should the system do?

Design
Answering: how should it do it?

We can talk about analysis and design of a system or of some aspect of a system.
$5400 first day
$250,000 first month
Exploring alternatives
Build prototypes/proof of concepts
Making judgments
Challenging assumptions
Clarifying discrepancies
Making decisions/pruning alternatives
Deliberately delaying decisions
Revisiting decisions
Defending decisions
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Requirements analysis

What does the customer want or need?

What is most important to the customer?

Requirements are often vague and the goal of requirements analysis is to remove the ambiguity or vagueness of the requirements.
Biggest challenges?

"Gathering requirements and dealing when requirements change... The technical things can always be figured out."

[Software engineer]
**Requirements analysis**

What does the customer want or need? Requirements are often vague and the goal of requirements analysis is to remove the ambiguity or vagueness of the requirements.

**The customer is always right.** True or false?
Requirements analysis

What does the customer want or need? Requirements are often vague and the goal of requirements analysis is to remove the ambiguity or vagueness of the requirements.

The customer is always right. True or false?

Sometimes simply asking isn’t sufficient. Might need a mix of: discussions around use cases/scenarios, prototypes, paper mockups, research activities targeting the user community, or judgment that comes from experience.
In a formal development process the output from analysis activities might be:

Well understood and prioritized requirements.
A high-level understanding of the system.
Initial estimates for the effort required to implement the requirements.
Possibly the design of the user interface.
Domain models
A conceptual model of the domain including the key concepts and the vocabulary of the system. Includes main entities and relationships giving a **structural view** of the problem space.

Use cases and alternatives
Formally capture the functional requirements of a system. This provides a **dynamic view** of the problem space (i.e., it is about the behavior).
Warnings

Vague requirements

Inadequate customer involvement

Requirements without priorities

Analysis paralysis

Scope creep

Features nobody uses

Looking for the perfect implementation*

* Antidote: tests tied to requirements

http://www.processimpact.com/articles/reqtraps.html