



# Course Overview: CS 577b Software Engineering II

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# Outline

- **Course objective and challenge**
- **Project schedule**
- **Course Schedule**
- **Project Status and Team Formation**
- **Project and Team Risk Management**
- **Project Planning**
- **Other course preparation**
  - **Academic integrity reminder**

# CS 577b Course Objective

- **Learn how to go**
  - From a successful LCA package
  - To a successfully delivered software system
- **Main Elements**
  - Coping with the devils in the details
  - Understanding how the stakeholders will operate and maintain the system
  - Using the MBASE project guidelines



# Challenge: IOC vs LCA Client Evaluations

Metric	USC 1996-97	USC 1997-98	USC 1998-99	Columbia U-grad. 99	Columbia Grad. 99
<b>Fall Semester: LCA Package</b>					
Teams	15	16	20	20	13
Students	86	80	102	107	59
Applications	12	15	17	10	10
Teams failing LCO review	4	4	1	10	6
Teams failing LCA review	0	0	0	0	1
Pages, LCO package	160	103	114	124	116
Pages, LCA package	230	154	167	142	142
Client Evaluation (1-5, 5 best)	4.46	4.67	4.74	-	-
<b>Spring Semester: IOC Package</b>					
Teams	6	5	6	Remained the same since projects were only one semester long	
Students	28	23	28		
Applications	8	5	6		
Teams failing IOC acceptance review	0	0	0	0	0
Applications satisfying clients	5	5	6	20*	12*
Applications not overtaken by events	6	4	4	10	9
Applications continued	3	3	TBD	-	-
Applications used	1	3	TBD	10	5
Client evaluation	-	4.15	4.3	4.44	4.21



## Software engineering education stakeholders and win conditions. - I

<b>Stakeholders</b>	<b>Win conditions</b>
<b>Students</b>	<ul style="list-style-type: none"><li>• Lifelong-value knowledge and skills</li><li>• Marketable near-term skills, experience</li><li>• Fair workload, grading</li><li>• Rewarding intellectual, social experience</li></ul>
<b>Industry</b>	<ul style="list-style-type: none"><li>• Lifelong-value knowledge and skills</li><li>• Relevant near-term skills, experience</li><li>• Full-spectrum coverage of life-cycle, discipline (people, economics, domain) skills</li><li>• High volume of graduates</li><li>• Distance learning opportunities</li></ul>



## Software engineering education stakeholders and win conditions. - II

Stakeholders	Win conditions
Class-project clients	<ul style="list-style-type: none"><li>• Well-engineered products</li><li>• Easy to transition and use</li><li>• Efficient use of client time</li><li>• Minimum operational disruption</li><li>• Client knowledge and skills developed in information technology</li></ul>
Software engineering community	<ul style="list-style-type: none"><li>• Experience-based improvements in software engineering tools and techniques</li></ul>
Instructors, teaching assistants	<ul style="list-style-type: none"><li>• Create, sustain stakeholder win-win enterprise</li><li>• Confront, resolve win-lose risks</li><li>• Contribute to software engineering and SE education state-of-art, state-of-practice</li><li>• Manageable workload</li><li>• Rewarding intellectual, social experience</li></ul>



# Project Schedule

- Jan. 16** - **Re-form teams**
- Feb. 4** - **Draft LCA-Rebaseline on Web**
- Feb. 14-15** - **LCA-Rebaseline ARB reviews**
- Mar. 18-27** - **Core Capability Demos**
- Apr. 8** - **Draft Transition Package on Web**
- Apr. 15-16** - **Transition Readiness Reviews**
- May 1** - **Product Delivery**
- May 3** - **Individual Critiques, Client Evaluations**



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# **CS 577B Client Activities Spring 2002**

**Barry Boehm, Dan Port, Winsor Brown,  
LiGuo Huang, Ahmad Alsawi**

**January 7, 2002**



# Main Challenge for Clients

- **Products are delivered on May 1**
- **By May 8, students have disappeared**



# Summary of Client Activities

**Jan 16 - Feb 13: Work with teams:**

- Rebaseline prototype, prioritized requirements
- Consider use of Easy Win Win
- Plan for CS 577b specifics, including transition strategy, key risk items

**Feb 14-15: Participate in ARB review of rebaselined Life Cycle Architecture Package**

**Feb 18- Apr 12: Nominal Weekly Meetings with Teams to:**

- Discuss status and plans
- Provide access to key transition people for strategy and readiness discussions

**Mar 18-27: Core Capability Demos**

**Apr 15-Apr 16: Project Transition Readiness Reviews**

**Apr 17: Begin Installation and Transition**

- Install Product
- Execute Transition Plan

**May 1: Release Readiness Review for Product Release**

**May 3: Client Evaluations**

# Project Selection Decisions

- **Try to staff all selected projects**
  - **Using 5-person teams, normally feasible**
- **Drop projects not reaching critical mass**
- **Continue paid summer internship program to ensure transition, supplement IOC capabilities**



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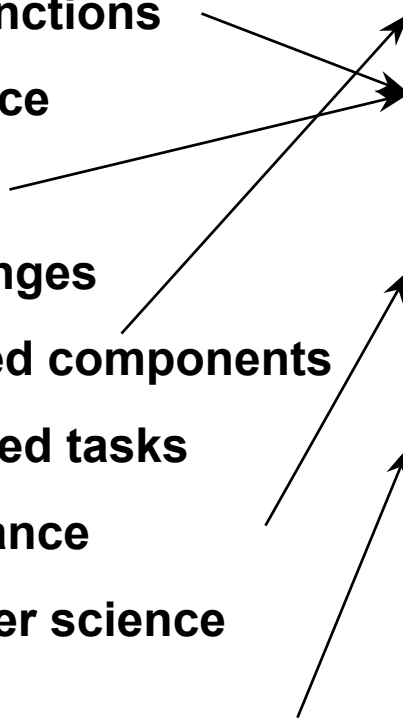
# Top 10 Risk Items: 1989 and 1995

**1989**

1. Personnel shortfalls
2. Schedules and budgets
3. Wrong software functions
4. Wrong user interface
5. Gold plating
6. Requirements changes
7. Externally-furnished components
8. Externally-performed tasks
9. Real-time performance
10. Straining computer science

**1995**

1. Personnel shortfalls
2. Schedules, budgets, process
3. COTS, external components
4. Requirements mismatch
5. User interface mismatch
6. Architecture, performance, quality
7. Requirements changes
8. Legacy software
9. Externally-performed tasks
10. Straining computer science



# Primary CS577b Risk Items

- **Personnel: commitment; compatibility; ease of communication; skills (management, Web/Java, Perl, CGI, data compression, ...)**
- **Schedule: project scope; IOC content; critical-path items (COTS, platforms, reviews, ...)**
- **COTS: see next chart; multi-COTS**
- **Rqts, UI: mismatch to Library user needs**
- **Performance: #bits; #bits/sec; overhead sources**
- **External tasks: Client/Operator preparation, commitment for transition**

# **COTS and External Component Risks**

- **COTS risks: immaturity; inexperience; COTS incompatibility with application, platform, other COTS; controllability**
- **Non-commercial off-the shelf components: reuse libraries, government, universities, etc.**
  - **Qualification testing; benchmarking; inspections; reference checking; compatibility analysis**

## **CS 577b Planning - Common LCA - LCP Problems**

- **Test and transition preparation**
  - Transition-leader's success plan (teammates, clients)
- **Core capability specifics**
  - End-to-end demonstrable capability
- **Specific team member responsibilities**
  - By artifact and increment; but flexible
- **Possible RLCA prototype, business-case iterations**
- **Too many internal-increment deliverables**

# Test Preparation

- **Test-leader's success plan**
  - Test data, drivers, tools, increments
  - Problem tracking and closeout: gnats tool
- **Testing as requirements evaluation**
  - Testing full portability, 24X7, ease of use
  - OK to iterate requirements
- **Verification cross-reference index**
  - Which requirements verified by test, analysis, inspection

# Other Course Preparation

- **Breadth reading assignments and homeworks**
  - Readings TBD in Electronic Papers
- **CMMI Web Site**
  - <http://www.sei.cmu.edu/cmm/cmmi>
- **Instructor staff: Barry Boehm, Dan Port, Winsor Brown, Ed Colbert**
- **TA's: LiGuo Huang, Ahmad Alsawi**
- **Grading: Homework 30%; Project 50%, Critique 20%**
- **Questionnaires: Project skills, agreement form**
  - Academic integrity reminder