

**Telecommunications Economics, TLEN 5010**  
 Tuesday-Thursday, 3:30-4:45, Room: ECCS 1B28

**Provisional**  
[Administrative](#)  
 (Dr. Alleman)

[Link to WebCT](#) (password required)

[printer friendly version of Syllabus](#)  
[Lectures](#)

[Week 1](#), 29-31 August; [Week 2](#), 5-7 September; [Week 3](#), 12-14 September; [Week 4](#), 19-21 September; [Week 5](#), 26-28 September; [Week 6](#), 3-5 October; [Week 7](#), 10-12 October; [Week 8](#), 17-19 October; [Week 9](#), 24-26 October; [Week 10](#), 31 October-2 November; [Week 11](#), 7-9 November; [Week 12](#), 14-16 November; [Week 13](#), 28-30 November; [Week 14](#), 5-7 December; [Week 15](#), 12-14 December; [Week 16](#), 19-21; December; 16 December – Final

[Administrative](#)  
[Instructor, e-mail instructor](#)  
[Graders, e-mail graders](#)  
[Texts](#)  
[Grading policy](#)  
[Final exam](#)

Date/Week		Topic	Reading Assignment	Homework	HW Due Date (In class)
29-31 August	1	<a href="#">Administrative</a> <a href="#">Economic Framework and Issues</a> <a href="#">Demand Analysis</a>	L&T, Chapter 1; V&M, Chapters 1 & 2*, B&S, Chapters 1 & 2*; & SW&W, Chapters 1, 8, & 9* Madden, Chapter 5; V&M, Chapters 3 & 4*; B&S, Chapters 3 & 4*; SW&W, Chapters 10*		
5-7 September	2	Overview of the telecommunications industry Production/Cost Analysis	<a href="#">USA Mobile's Business Model</a> <a href="#">Example, slides</a>  <a href="#">Supply, Professor Savage</a> <a href="#">slides</a>	<b>Quiz 1</b>	
12-14 September	3	<a href="#">Introduction/Overview to Finance</a> <a href="#">Financial Statements</a>	P-Chapters 1 & 2 B&M Chapters 1, 2, & 3 <a href="#">P Chapter 1</a> , <a href="#">P Chapter 2</a> , <a href="#">B&amp;M Chapter 1</a> , <a href="#">B&amp;M Chapter 2</a> . <a href="#">B&amp;M Chapter 3</a>  Spreadsheet: <a href="#">Example 1</a>	<b>Quiz 2</b> <b>HW 1:</b> P – 2.1 & 2.4 B&M: 3.1, 3.2, & 3.3 <b>Example spreadsheet <a href="#">3.11</a></b> <b>Spreadsheet template:</b> <a href="#">B&amp;M Chapter 3</a> <b>Solution:</b> <a href="#">HW 1</a>	19 September
19-21 September	4	Financial Statements (continue) <a href="#">Time Value of Money/Equivalence</a>  Discounted Cash Flow Analysis	P-Chapters 4 & 5	<b>HW 2:</b> P – 4.1, 4.4, 4.5, 4.7, 4.12, 4.14, 4.15, 4.17, 4.20, 4.25, 4.27, 4.30a, 4.35, 4.48, 4.51, 4.55 B&M – 4.1, 4.14, 4.21, 4.37, 4.41	26 September

		Interest and Financial Mathematics	<p>B&amp;M Chapters 4 &amp; 5  <a href="#">P Chapter 4</a>  <a href="#">P Chapter 5</a>  <a href="#">B&amp;M Chapter 4</a>  <a href="#">B&amp;M Chapter 5</a></p> <p>Spreadsheet: <a href="#">Example 2</a></p>	<p><b>Spreadsheet template:</b>  <a href="#">B&amp;M Chapter 4</a>  <a href="#">B&amp;M Chapter 5</a>  <b>Solutions</b>  <a href="#">B&amp;M 3.10</a>  <a href="#">B&amp;M 3.11</a>  <b>Solution:</b> <a href="#">HW 2</a></p>	
26-28 September	5	<p>Time Value of Money/Equivalence (continue)  <a href="#">Present (Value)/Annual Worth</a></p> <p>Valuation of bonds/stocks  <b>Tri-term TEST</b></p>	<p>P-Chapter 6  B&amp;M Chapters 7, 8, &amp; 9  <a href="#">P Chapter 6</a>  <a href="#">B&amp;M Chapter 7</a>  <a href="#">B&amp;M Chapter 8</a>  <a href="#">B&amp;M Chapter 9</a></p> <p>Spreadsheet: <a href="#">Example 3</a></p>	<p><b>HW 3:</b> P - 5.1, 5.8, 5.11, 5.15, 5.20, 5.22, 5.46, 5.50, 5.65.  P - 6.1, 6.5, 6.7, 6.13,  B&amp;M - 4.1, 4.3, 4.6, 4.21, 4.27  B&amp;M - 5.1, 5.7, 5.9  B&amp;M - 7.1, 7.9  B&amp;M - 8.1, 8.3, 8.6  <b>Spreadsheet template:</b>  <a href="#">B&amp;M Chapter 8</a>  <b>Solution:</b> <a href="#">HW 3</a></p>	3 October
3-5 October	6	<p><a href="#">Cost Concepts</a>  <a href="#">Poverty of Cost Models</a>  <a href="#">Mandatory Unbundling and Irreversible Investment in Telecom Network</a></p>		<p><a href="#">Optional Assignment</a>  <a href="#">Optional Assignment answers</a></p>	
10-12 October	7	<p>Present and Annual Equivalent Worth  <a href="#">P Chapter 7</a>  <a href="#">P Chapter 8</a>  <a href="#">Present and Annual Equivalent</a></p>	<p>P-Chapters 7 &amp; 8</p> <p>Spreadsheet: <a href="#">Example 4</a></p>	<p><b>Quiz 3</b>  <b>HW 4:</b> P - 7.3, 7.7, 7.8, 7.17, 7.21, 7.35, 7.39, 7.41, 7.47  P - 8.1, 8.3, 8.8, 8.16, 8.19, 8.27, 8.35, 8.41  <b>Solution:</b> <a href="#">HW 4</a>  <b>Solutions:</b> <a href="#">P 8.19 &amp; 41</a></p>	17 October
17-19 October	8	<p>Production/Cost Analysis (continued)  Welfare &amp; Efficient Pricing  <a href="#">VoIP Demand</a></p>	<p><a href="#">The Pricing Primer</a>  <a href="#">Pricing Fundamentals</a></p>		
24-26 October	9	<p>Analysis of Alternatives  <a href="#">P Chapter 9</a>  <a href="#">Internal Rate of Return</a>  <a href="#">P Chapter 10</a>  <a href="#">Depreciation</a>  <a href="#">Taxes</a>  <a href="#">P Chapter 11</a></p>	<p>P-Chapter 9, 10, &amp; 11</p>	<p><b>Quiz 4</b>  <b>HW 5:</b>  B&amp;M - 9.1, 9.3, 9.4  P - 9.2, 9.6, 9.10, 9.18, 9.27, 9.33, 9.38  P - 10.1, 10.5, 10.9, 10.11, 10.18, 10.30, 10.37  <b>Solution:</b> <a href="#">HW 5</a>  <b>Spreadsheet template:</b> <a href="#">B&amp;M Chapter 9</a>, <a href="#">10.9.</a>, <a href="#">10.18.</a> &amp; <a href="#">10.30</a></p>	31 October

31 October- 2 November	10	Developing Project's Cash Flows <a href="#">P Chapter 12</a> <a href="#">B&amp;M Chapter 6</a> Replacement Analysis <a href="#">Replacement slides</a> <a href="#">P Chapter 15</a>	P-Chapter 12 B&M Chapter 6  P-Chapter 15	<b>HW 6:</b> P – 11.2, 11.4, 11.5, 11.9, 11.15, 11.17, 11.25  <b>Spreadsheet:</b> <a href="#">replacement</a>  <b>Solution:</b> <a href="#">HW 6</a>	7 November
7-9 November	11	Regulation – Rate-of-return regulation & incentive regulation <a href="#">Universal Service &amp; slides</a> ; <a href="#">FCC's material</a> Madden, Chapter XI; L&T, Chapter 6; B&S, Chapters 5 & 6	L&T, Chapter 2; B&S, Chapters 3, 4, & 5. <a href="#">Economics of Regulations &amp; slides</a> <a href="#">Equilibrium, Professor Savage</a>		14 November
14-16 November	12	<a href="#">International Overview, Settlement Alternatives &amp; slides</a> ; <a href="#">FCC's International material</a>  <a href="#">International trade</a> <b>Second Tri-term TEST</b>	<a href="#">Who Pays for Universal Service</a> <a href="#">Universal Service Poverty of Policy</a> <a href="#">International Interconnection, Professor Savage</a>		
21-23 November		<b>Fall break/Thanksgiving Vacation; No class</b>			
28-30 November	13	Interconnection/Access Charges	L&T, Chapter 3, 4, & 5; B&S, Chapter 7; V&M Chapter 6 & 7, Nuechterlein & Weiser, Appendix A, <a href="#">"Mandatory Unbundling and Irreversible Investment in Telecom Network," Pindyck</a> <a href="#">B&amp;S Review, Interconnecting the Network of Networks Review</a> <a href="#">Interconnection, &amp; slides</a> , <a href="#">Interconnection requirements slides</a>	<b>Quiz 5</b>	
5-7 December	14	Telecommunications Cost Issues <a href="#">Real Options Methodology</a>	<a href="#">FCC's Cost Models material</a> <a href="#">The Poverty of Cost Models</a> <a href="#">Forward-looking Costs</a>	<b>Quiz 6</b>	
12-14 December	15	<a href="#">Competitive Policy, FCC's Local Competition material</a> Linear & Non-linear Tariffs  <a href="#">Review</a> Spreadsheets <a href="#">Replacement</a>	V&M Chapter 8 <a href="#">Price Discrimination</a> <a href="#">Information Overview</a>		

		<a href="#">Lottery</a>			
16 December		<a href="#">Final Exam</a>	Sample examinations <a href="#">Engineering Economics 1</a> <a href="#">Engineering Economics 2</a> <a href="#">Engineering Economics 3</a> <a href="#">Engineering Economics 4</a>  <a href="#">Economics &amp; Policy 1</a> <a href="#">Economics &amp; Policy 2</a> <a href="#">Economics &amp; Policy 3</a> <a href="#">Economics &amp; Policy 4</a>	Quizzes (in pdf format) <a href="#">Quiz 1</a> <a href="#">Quiz 2</a> <a href="#">Quiz 3</a> <a href="#">Quiz 4</a> <a href="#">Quiz 5</a> <a href="#">Quiz 6</a>	

**Tri-term exam, Thursday, 28 September, ECCR 244 (second floor computer room, Northwest corner); Second tri-term exam, Thursday, 16 November**  
**[Final Exam](#): 16 December 2006, 7:30-10:00 PM in Engineering Building ECCR 244 (second floor computer room, Northwest corner).**

[Top](#)

**Key:** B&S = Baumol & Sidak; B&M = Bodie & Merton; B = Benninga; L&T = Laffont & Tirole; P = Park; S&V = Shapiro & Varian; \* = optional.

#### Required Texts

Bodie, Zvi and Robert C. Merton. *Finance*, Prentice-Hall, New Jersey: Prentice-Hall, 2000. (B&M)

Laffont, Jean-Jacques and Jean Tirole. *Competition in Telecommunications*, MIT Press, 1999. (ISBN 0262122235). (L&T)

Park, Chan. *Contemporary Economic Economics*, 4<sup>th</sup> ed. Prentice-Hall, New Jersey: Prentice-Hall, 2007. (ISBN 0-13-187628-7) (P)

#### Optional readings

Baumol, William J. and J. Gregory Sidak. *Toward Competition in Local Telephony*, The MIT Press Cambridge & London, and The American Enterprise Institute for Public Policy Research, Washington, D.C., 1994. (B&S)

Benninga, Simon. *Financial Modeling*, second edition, MIT Press, 1997. (B)

Madden, Gary (ed.). *The International Handbook of Telecommunications Economics, Volume I: Traditional Telecommunications Networks* Edward Elgar Publishers, Cheltenham, UK (2003). (Madden)

Nuechterlein, and Philip J. Weiser, *Digital Crossroads: American Telecommunications Policy in the Internet Age*, The MIT Press, Cambridge, Massachusetts, 2005. ISBN 0-262-14091-8. Appendix A.

Saunders, M., J.J. Warford, and B. Wellenius. *Telecommunications and Economic Development*, (revised edition) World Bank, Baltimore and London, The John Hopkins University Press, 1993. (S,W&W)

Shapiro, Carl and Hal R. Varian. *Information Rules: A Strategic Guide to the Network Economy*, Harvard Business School Press, Boston, MA, 1999. (S&V)

Vogelsang, Ingo and Bridger M. Mitchell. *Telecommunications Competition, the last Ten Miles*, The MIT Press Cambridge & London, and The American Enterprise Institute for Public Policy Research, Washington, D.C., 1997. (V&M)

#### Articles

Alleman, James. "The Poverty of Cost Models, The Wealth of Real Options", in Alleman and Noam (eds.), *The New Investment Theory of Real Options and Its Implications for Telecommunications Economics*, Regulatory Economics Series, Kluwer Academic Publishers, Boston, MA 1999; pp. 159-179.

Alleman, James and Paul Rappoport. "Universal Service: A Policy Survey, Review and Critique," *The International Handbook of Telecommunications Economics, Volume I: Traditional Telecommunications Networks* Madden, Gary (ed.), Edward Elgar Publishers, Cheltenham, UK (2003), pp. 315-336.

Examples of a financial analysis of a company/sector

[Verizon](#)  
[SBC Communications](#)  
[Global Telecom Weekly](#)

### Homework Grading Policy

#### In-class & CAETE

One assignment per week and individual homework. Late penalty will be one tenth (1/10) of your total score; each homework total score is 100 points. Your assignment is due at the beginning of class on the due date. Copying homework/exam from friend(s) or any other materials is considered cheating. Penalty to all who are cheating will be zero score for that homework and/or exam. Please make sure to include your name, student identification, and Chapter and problem numbers in upper right corner of each page and that all pages are stapled together. (No paper clips, please):

Please show all your work in order to get full credit. If submitted incorrectly, 5% will be removed from points on your assignments. Answer sheets will be provided with graded homework on the web site.

**Grading: Homework/quizzes = 55%, Examinations = 35%, Class discussion = 10%**

Class meets at 3:30 - 5:15, Tuesday & Thursday, Engineering ECCS 1B28.

#### CAETE

##### Homework

You may only send your homework by e-mail to the WebCT site. **No other way is accepted.** Your assignments are due one class-period after the in-class assignments are due.

##### Examination and quizzes

If the examination or quiz is **not** on WebCT, you may send your examination and quizzes by U.S. mail or by fax to +1 303 492-1112. No other way is accepted. If you mail it, make sure you staple it and follow above instruction. (Your name and student identification number,). Faxes, obviously will not arrive stapled, but again follow the above instructions.

The address is:

Interdisciplinary Telecommunication Program  
c/o Ushesh Desai  
TLEN 5010  
Campus Box 530  
Boulder, CO 80309-0530  
The fax number is (303) 492-1112

#### WebCT NOTICE

E-mail list

Class E-mail list is [ten-5010-f06@lists.colorado.edu](mailto:ten-5010-f06@lists.colorado.edu)

To subscribe, send a message to:

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With body of message being:

Subscribe ten-5010-f06 your first and last name.

#### Administrative

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E-mail: [chanchal.puthussery@colorado.edu](mailto:chanchal.puthussery@colorado.edu)**Technical Support****WebCT**If you have problems connecting to WebCT, contact TBA (TBA[@colorado.edu](mailto:TBA@colorado.edu)).**CU Anywhere**If you have problems connecting to CU Anywhere, contact TBA (TBA[@colorado.edu](mailto:TBA@colorado.edu)).**Copyright © 2003, 2004, & 2006 by James Alleman**

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Campus policy states that every effort shall be made to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Students should notify the instructor of anticipated conflicts as early in the semester as possible so that there is adequate time to make necessary arrangements. The full text of the Boulder campus policy is available at [http://www.colorado.edu/policies/fac\\_relig.html](http://www.colorado.edu/policies/fac_relig.html).

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All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Additional information on the Honor Code can be found at <http://www.colorado.edu/policies/honor.html> and at <http://www.colorado.edu/academics/honorcode/>

**Disability services**

If you qualify for accommodations because of a disability please submit to me a letter from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities (303-492-8671, Willard 322, [www.colorado.edu/disabilityservices](http://www.colorado.edu/disabilityservices)).

**Sexual harassment**

The University of Colorado Policy on Sexual Harassment applies to all students, staff and faculty. Sexual harassment is unwelcome sexual attention. It can involve intimidation, threats, coercion, or promises or create an environment that is hostile or offensive. Harassment may occur between members of the same or opposite gender and between any combination of members in the campus community: students, faculty, staff, and administrators. Harassment can occur anywhere on campus, including the classroom, the workplace, or a residence hall. Any student, staff or faculty member who believes s/he has been sexually harassed should contact the Office of Sexual Harassment (OSH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the OSH and the campus resources available to assist individuals who believe they have been sexually harassed can be obtained at: <http://www.colorado.edu/sexualharassment/>

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Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to behavioral standards may be subject to discipline. Faculty have the professional responsibility to treat students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which students express opinions. See policies at <http://www.colorado.edu/policies/classbehavior.html> and at [http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student\\_code](http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code)

[Top](#)