PHYSICS 100 TELECOURSE
"Mechanical Universe"
Winter 2009

January 2009

Dear Physics Telecourse Student:

Welcome to the Physics 100 telecourse, The Mechanical Universe. This introductory letter will provide an outline of the course and address many of the questions and concerns of telecourse students. Although this is a lengthy communication, please read it carefully and ***keep*** it for reference throughout the course. Bring this with you in order to refer to it when you come to the orientation meeting discussed later.

COURSE

This is a 5-credit, college level, text based, and self-directed course of study, with some on-line assignments using Blackboard. The course also uses telelessons from The Mechanical Universe and from Beyond the Mechanical Universe. The California Institute of Technology and the Southern California Consortium produced these series.

Before continuing with the course information, I would like to ***stress several important points***. ***First***, while the telelessons include and use some calculus and algebra, knowledge of either is not necessary for this course. This course is a survey of introductory physics requiring little, but some mathematics; high school math through freshman year should be sufficient. This course covers some history of physics (and science) and many of the important concepts in physics. ***Second***, veterans registering for telecourses should check with the Veteran's Affairs Office. ***Third,*** this is a lab course with a weekly lab meeting on campus, and failure to attend at least half the labs will earn a failing grade regardless of your other work (if an odd number of labs, round up)! ***Fourth,*** some computer and on-line experience is necessary since some assignments and exams are web based involving written work, discussions, and student communication using Blackboard. You will access this through **bbccs.spokane.edu** (or linked through the SFCC homepage)**;** your user name is your SID and password information will be provided at login as well at the orientation meeting. Be sure to go to the bbccs website, not the WAOL site.

INSTRUCTOR

I, Mike Rodman, will be your physics consultant for the televised Physics 100 course, The Mechanical Universe. I am an instructor in physics at Spokane Falls Community College. I will be the one you will meet with during the activity/lab sessions and am the one who makes up your tests, grades them and assigns your grade. Any questions, complaints, or concerns about this course should be directed to my attention. Please feel free to call me. My office phone is 533-3668 or miker@spokanefalls.edu . You may also find the Web useful for research and questions. The SFCC site is www.spokanefalls.edu . Blackboard as well as faculty homepages and Online Syllabus (autowebs) are available from this site.The fax number is 533-3856. Leave a message if I am not there. Please be sure to leave your name, number, and the time when I can reach you so that I can return your call. My office hours will be 9:30, Monday, Wednesday, Thursday and Friday; 11:30 Monday, Wednesday, Friday, and 1:00 Thursday. My office is in Building 18, Room 107A. Anyone who would like to have student/teacher contact is welcome to schedule an appointment with me. There will also be physics tutors available in either room 18-109, or 18-124, however at this time their schedule is not set. Finally, you can always reach me by writing to:

Mike Rodman
Spokane Falls Community College
3410 W. Fort Wright Drive
MS 3180
Spokane, WA 99224

PERILS

Telecourse/hybrid students spend most of their time on their own. This format is an alternative form of instruction suited for those whose job, family or other obligations and circumstances make a regular on-campus schedule difficult or impossible. This scheduling freedom is ideal for the well organized, motivated, self-disciplined student. Those who wait until the last minute or who are academically adrift usually face unfavorable results. Pace yourself and keep on top. Seek help when you need it, not at exam time. Telecourses are not "snap" courses; expect workloads, requirements, and standards equivalent to that of an on-campus class.

COURSE MATERIAL

You will need to purchase:

1. Required Text-Hewitt: *Conceptual* ***Physics, w/ Practicing Physics bundle; 10th ed,***
   ISBN # 0-805-391908 (contains text; 0805393757 & workbook; 0805391983)
   (see attached order form)
2. Basic calculator is useful
3. A few sheets of graph paper (reasonably large grid, e.g. a 1 centimeter grid works well)
4. All material can be purchased in the bookstores at Spokane Falls Community College
   (533-3565 and **bookstore.ccs.spokane.edu/spokanefalls**)
   and Spokane Community College
   (533-7087 and **bookstore.ccs.spokane.edu/spokane**)

The bookstores at SFCC and SCC are open from 7:30am to 6:00pm Monday through Thursday, and Friday 7:30 to 2:00pm. These hours may change and, in addition, the bookstore may have extended hours at the beginning of the term thus I recommend calling the bookstore at their numbers or go to the on-line stores listed above. Look your text over and prepare for the first three lessons. These lessons begin on Wednesday, January 9 and can be viewed on Cheney/Medical Lake Channel 8, TCI Channel 19, VideoWave Channel 30, Fiber Vision (Fairchild) 59 or at the telecourse centers.

The text is the heart of the course. It is not extensive reading, but it is intensive reading. Read it and refer to it regularly and often. You will be assigned material from the text and workbook. The text for this course emphasizes concepts, introduces mathematics to support a concept, and presents some everyday physics applications. Its approach to the ordering of topics and material is more or less traditional. This text emphasizes history and concepts, nevertheless mathematics appears in some sections. Read the math material and try to follow the arguments, but very little math is necessary for homework and tests. The original telelessons, however, take a more unusual ordering sequence. I have changed the telelesson sequence to achieve a closer match with the text, but unavoidable variations in manner and sequence of presentation remain. Consequently, do not hesitate to skim through the text whenever a telelesson item not mentioned in the related chapter piques your interest.

GRADE/CONDUCT
Your grade will be determined from the following quantitative components:

_ exams	=	40%
_ laboratory	=	39%
_ projects/activities/workbook	=	20%
_ homework from text	=	1%

At the end of the term, each of your components will be totaled and compared to the total possible. Then your component comparison will be weighted by the above percentages. These percentages will be totaled, multiplied by 100 and assigned a grade as follows:

≥ 91	=	4.0
≥ 89 to 91	=	3.5
≥ 81 to <89	=	3.3
≥ 73 to <81	=	2.8
≥ 66 to <73	=	2.5
≥ 59 to <66	=	2.0
≥ 50 to <59	=	1.7
≥ 35 to <50	=	1.3
≥ 20 to <35	=	0.9
> 25	=	0.0

However, I reserve the right to consider such factors as exceptional participation, extraordinary work, cheating, and other factors in determining the final grade. (You may want to read the student ***Conduct Code and Rules for Enforcement***; notice that loss of a grade or expulsion from class or SFCC is a possible outcome for inappropriate behavior.)

Your laboratory reports with calculations and graphs are either handed in at the current lab or handed in at each following lab. Depending on the particular assignment, projects and activities, laboratories, and homework are either to be handed in with tests, during lab, or on-line before the due date. The mode of handing in will be announced in labs.

Note! There is no extra credit. It is the student's responsibility to officially withdraw from class. February 24 is last day to withdraw with a W grade. The ***Z*** grade is given only under very special circumstances and only to those students who discuss their situation with me.

ORIENTATION
There is a ***mandatory*** orientation meeting, which also counts as your first lab meeting. It is ***Wednesday, January 7 at 5:30 p.m.*** This meeting is worth 10 points as a lab grade. This meeting is on the SFCC campus in 18-109 (Building 18, room 109) across and down the hall from the main office (18-110). During orientation we will discuss the components of the course, grading, lab structure and any address information. Also details of the on-line component such as assignments, navigation, login, etc. will be covered.

LABS (39% of grade)
Labs will meet every week on the SFCC campus, Wednesday from 5:30 to 7:30 p.m. in Room 18-109. I will attempt to hold one or more labs off site, but this has not been confirmed yet. See orientation above. When entering the lab, sign the sign-in sheet and pick up a lab handout. Lab experiments are done as a group; one group for each table (station). Ideally no more than four students per lab station but class size ultimately determine this. Each person hands in his or her

own report. Lab reports take various forms and are always handed in lab; not online. Some are handed in with calculations the same day. Some may be more involved with graphs and calculations and original data, which are handed in the following lab period a week later. One or more labs may be formal full reports which consist of one or more typed pages, followed by any graphs, calculations, data tables, etc. called for and last, the initialed raw data page. A formal lab is worth 20 points.

If and when the report is formal, adhere to the following format and write the word laboratory and its name at the top. Note this structured format only applies to a formal lab if one is assigned; Only for a Formal Laboratory Report:

Laboratory- "*Name*"

Your name: both typed and also your signature
All **partners names** in the group
Title of the Lab
Introduction: 1 or 2 sentences stating the purpose or goal of the lab
Procedure: A paragraph describing the equipment, how it is used, what you did to collect the
Results: A paragraph telling what your results were (numerical values and/or outcome). Tell about any difficulties you encountered and possible sources of error. Also answer whether you were satisfied with your results and why.

All other labs are worth 10 points; 2 points for attending the lab and collecting the data, and the other 8 points for mechanics, organization, thoroughness, objectivity, focus, and completeness. Since this is a lab course, **a minimum of half the total labs assigned must be completed to pass the course**. The last lab day of the course is a make-up lab for those that miss one. Note that make-up labs are penalized 10% (1 point) and that **only one lab can be made up**. Reports are due by the beginning of the next lab. This is usually one week later. Since charts, graphs and calculations can be difficult to hand in and read electronically; generally do not e-mail lab reports. Note, no lab is dropped; however, one lab may be made-up. The last class meeting is set aside as a make-up lab day.

Examples of typical laboratories may be made up from the following labs, meeting every Wednesday from 5:30-7:30 p.m. in 18-109. Some variation in lab coverage is probable and depends on scheduling equipment with other labs. Note, also that a $15.00 lab fee is assessed at registration.

Week 1: Course Orientation, and Introduction to Laboratory Procedures
Week 2: Behr Free Fall (or alt. Motion lab using motion detectors)
Week 3: Newton's Laws using air tracks (or alt. Behr Free Fall or friction)
Week 4: Work on Inclines (or alt. Ballistic Pendulum)
Week 5: Light Bulbs Modeling Gravity
Week 6: Springs/pendulums (or waves on a string or speed of sound)
Week 7: Ohms Law (or magnetic fields or circuits)
Week 8: Specific heat (or heat transfer)
Week 9: Thermocouple
Week 10: Diffraction Grating (or alt. Polarized Light)
Week 11: Spectroscopy (or alt. Rutherford model)

EXAMS/ QUIZES (40% of grade)
Each week except the first week will have an open book one hour test of ten questions worth roughly 20 points. All tests count, none are dropped. Make-up tests are allowed, but any test

made-up afterwards will be automatically penalized 20% for each week late. If the test is taken before the test time, no penalty is assessed; however, special arrangements will have to be made with the instructor. Tests will be multiple choice and short answer.
All tests are open book, open homework and open notes; one hour is allowed for each test.

The exams will be taken Online and open Sunday morning for one week, closing midnight the following Sunday. You will have 1 hour (occasionally 1.5 hours) to take the test and only one try. All tests are open book and notes. By making special arrangements before hand with me, hard copy tests can be taken at one of the telecourse centers during their open hours (schedules and locations provided on the enclosed telecourse center page) or directly with me. Late tests get prorated 10% penalty. For the SFCC telecourse center, tests are taken in Building 2; hours are Thursdays from 7:30 a.m. to 9:00 p.m., Fridays from 8:00 a.m. to 4:00 p.m. and Saturdays 10:00 a.m. to 4:00 p.m. **However, note that telecourse center hours can vary so I would recommend that you check with your center for their hours and also test must be started 1 hour before closing if you expect to have the full 1 hour for the test**. If taken through me, they probably will be taken in lab earlier in the day.

ACTIVITIES/assignments; Attendance, Participation, Projects, Workbook (20% of grade)
There will be discussions in a "group" environment using Blackboard. Each week a brief assignment, also opening on Sunday for one week, will be posted. Generally you will answer and sometimes also respond to other classmate work on a posted question using Blackboard. Usually the point value is 0 to 4 points, however some questions may be worth more depending on how involved they are and the level of response. If the question requires responding to others in the class and you hand in a written result, you cannot receive the participation points associated with the question. Each week pages from the *Practicing Physics* workbook will also be assigned both in Blackboard and also in lab. These assignments are handed in as blocks within Unit 1 or 2 or 3; see calendar for due dates. Each assigned workbook page is worth 2 points (a check on the page equals 2 points). "Practicing Physics" workbook assignments must use the workbook pages, or they may be done on Xerox copies from the workbook. **Staple "Practicing Physics" workbook assignments together by chapter and not with the text work**. See the homework section below. Other material, particulars and assignments may be provided during lab sessions. There may be one or more longer projects involving research and use Blackboard. It can vary in point value and in length up to four double-spaced typed pages and is handed in as a hard copy.

HOMEWORK from the hardcover text (1% of grade)
Note that this portion of the course is of the lowest point value. This is because I want you to concentrate on the workbook exercises. Only the <u>exercises</u> and <u>problems</u> sections of the text book after each chapter are graded for credit; the questions from the text are not graded but many students find them worth while for study and review! Each chapter assigned is worth a maximum of 4 points. To get credit for a chapter, you must do a minimum in any combination of 10 exercises and/or problems. If you do 10 adequately, you get 1 point for the chapter, and if you do any combination of 20 then you get 2 points. If the chapter has fewer than 20 total exercises and problems, then do them all for full credit. Note that a few chapters do not have a problem section. Like the workbook assignments, the chapter text homework are due by Unit groups:1,2,3 as indicated on the calendar Staple the text book work together in the unit bundles. Since there may be calculations, graphs, and or sketches, it is not recommended that these be handed in electronically. Do your problems in sequential order. Answer in complete sentences, or if a calculation show all work. Again, note that these text book assignments are due in units three times as unit 1, 2, or 3 during the quarter as indicated on the calendar. along with the "*Practicing Physics Workbook*" assignments. Staple the text book assignments together as a unit separately from the Practicing Physics Workbook assignments.

Unit 1 relates to tests 1, 2, 3 and covers:
programs 1, 2, 4, 5, 6, 8, 13, 14, 15 ***and***
chapters 1, 2, 3, 4, 5, 6, 7.

Unit 2 relates to tests 4, 5, 6 and covers:
programs 18, 28, 29, 34, 35, 37, 38, 39, 40 ***and***
chapters 19, 20, 21, 22, 23, 24, 25, 26, 29.

Unit 3 relates to tests 7, 8, 9, 10 and covers:
programs 41, 42, 43, 44, 24, 25, 45, 46, 47, 49, 50, 51 ***and***
chapters 30, 31, 35, 36, 15, 16, 17, 18, 11, 32, 33,34

The telecourse testing and meeting schedule is available on cable channels 8, 19, 30 and 59 and activity dates and times are offered each week: Sundays at 8:30; Mondays at 8:30 p.m.; Wednesdays at 8:30 p.m.; Fridays at 8:30 p.m.

LIBRARY SERVICES
Library services are available by calling the following numbers:

Local calls	533-3834
All others	1-800-251-1972

I look forward to meeting you and working with you this quarter. Remember, buy your books and begin watching the TV programs on TCI Channel 19, Videowave Channel 30, Cheney/Medical Lake Channel 8, or Fibervision (Fairchild) Channel 59. Plan to attend the ***Orientation Meeting, Wednesday, January 7 at 5:30 p.m.--IT IS REQUIRED***

Sincerely,

Michael Rodman
Telecourse Instructor/Consultant

Telecourse Centers

If you plan to take a test at one of these centers, please call the appropriate center to confirm testing time! Videotapes are available at the following Telecourse Centers:

SFCC Kyla Bates--Library--533-3216 or 1-800-251-1971
Open Monday through Thursday 7:30am-9pm; Friday from 7:30am-4pm;
Saturday from 10am-4pm; ***closed Sunday.***

SCC Michael Lynch--Library--533-8085
Open Monday-Thursday from 7:30am-9pm; Friday from 7:30am-4:30pm;
Saturday from 10am-4pm; ***closed Sunday.***

Chewelah Pat Thompson--Chewelah Library--935-6805
Open Monday, Wednesday from 12-8pm; Tuesday from 1-5pm;
Friday from 12-5pm; Saturday from 11am-5pm.

Colville Bronwyn Harris--Colville Campus Library--684-3138
Open Monday-Wednesday from 8am-8pm; Thursday from 8am-7pm;
Friday from 8am-4:30pm.

FAFB Judy Fox--Education Office--244-6636
Open Monday-Friday from 7:30am-4pm.

Inchelium Nancy Michel--Inchelium Resource Center--722-3701
Open Monday-Friday from 7:30am-4pm.

Newport Pat McGinty--Newport Community Center--447-3835
Open Monday-Thursday from 8am-9pm; Friday from 8am-5pm.

Republic Phyllis Mason--Community College Center--775-3675
Open Monday-Friday from 8am-4:30pm.

Colfax Telecourse Proctor--Whitman County Rural Library--397-4366
Open Monday-Thursday from 9am-8pm; Friday from 9am-6pm;
Saturday from 9am-5pm.

RENTAL POLICY

Telecourse videos may be rented from the Film Office located in the Library. The person to contact is Pat Brummett (533-3803). Individual weekly programs rent for $10.00-$15.00. The entire telecourse series may be rented for $35.00. For an additional $3.00 charge, the videos will be mailed to your address. To order either the individual or series video(s), you need to allow one-week advance notice. ***There is a non-refundable videotape processing fee if you withdraw from your telecourse. (see attached order form)***

PHYSICS 100 CALENDAR OF EVENTS Winter 2009

MONTH	*SUNDAY*	*MONDAY*	*TUESDAY*	*WED*	*THUR*	*FRIDAY*	*SAT*
January					**01/01**	**01/02 workday**	**01/03**
	01/04 begin Winter quarter	**01/05** Text: Text 1,2: Prog:1,2, 4	**01/06**	**01/07 Lab 1** ***Orientation***	**01/08**	**01/09**	**01/10**
	01/11 Test 1 opens Ch 1,2; UNIT 1	**01/12** Text: 3, 4, 5; Prog: 5, 6, 8	**01/13**	**01/14 Lab 2**	**01/15**	**01/16**	**01/17**
	01/18 Test 2 opens Ch 3,4,5 UNIT 1	**01/19** ***Holiday*** Text: 6, 7; Prog:13,14, 15	**01/20**	**01/21 Lab 3**	**01/22**	**01/23**	**01/24**
	01/25 Test 3 opens Ch 6,7 UNIT 1	**01/26** Text: 19,20,21; Prog:18,28, 29	**01/27**	**01/28** **Lab 4**	**01/29**	**01/30**	**01/31**
February	**02/01** Test 4 opens Ch 19,20,21 UNIT 2	**02/02** Text: 22,23,24**;** Prog:34,35,37	**02/03**	**02/04** **Lab 5; Unit 1 due**	**02/05**	**02/06**	**02/07**
	02/08 Test 5 opens Ch22,23,24 UNIT 2	**02/09** Text: 25,26,29; Prog:38,39,40	**02/10**	**02/11 Lab 6;**	**02/12**	**02/13**	**02/14**
	02/15 Test 6 opens Ch 25,26,29 UNIT 2	**02/16** ***Holiday*** Text:30,31; Prog:41,42,43	**02/17**	**02/18 Lab 7**	**02/19**	**02/20**	**02/21**
	02/22 Test 7 opens Ch 30,31 UNIT 3	**02/23** Text 35,36; Prog 44,24,25	**02/24**	**02/25 Lab 8; Unit 2 due**	**02/26**	**02/27**	**02/28**
March	**03/01** Test 8 opens Ch 35,36 UNIT 3	**03/02** Text:15,16,17,18; Prog:45,46,47	**03/03**	**03/04 Lab 9**	**03/05**	**03/06**	**03/07**
	03/08 Test 9 opens Ch 15,16,17,18 & Test 10 opens Ch 11,32,33,34 UNIT 3	**03/09** Text: 11,32,33,34; Prog:49,50,51	**03/10**	**03/11 Lab 10**	**03/12**	**03/13**	**03/14**
	03/15	**03/16**	**03/17**	**03/18 Lab 11; Only Make up unit 3 due**	**03/19**	**03/20** ***Dead day***	**03/21**
	03/22	**03/23** FINALS	**03/24** FINALS	**03/25** FINALS	**03/26** workday	**03/27** workday	**03/28**

Unit 1: test 1,2,3 **Chapters** 1, 2, 3, 4, 5, 6, 7 **Programs** 1, 2, 4, 5, 6, 8, 13, 14, 15
Unit 2: test 4,5,6 **Chapters** 19,20,21,22,23,24,25,26,29 **Programs** 18, 28, 29, 34, 35, 37, 38, 39, 40
Unit3: test 7,8,9,10 **Chapters** 30,31,35,36,15,16,17,18,11,32,33,34 **Programs** 41, 42, 43, 44, 24, 25, 45, 46, 47, 49, 50, 51

NOTE….telecourse programs change each Wednesday….

Cable Television Program Guide
PHYSICS 100 "Mechanical Universe
WINTER 2009

Week	General Topic	TeleProgram	Text Chapter	Dates	Unit
1	introduction motion	1: Intro to Mechanical Universe 2: Law of Falling Bodies 4: Inertia	1: Science 2: Inertia	01/07 to 01/14	
2	Newton's Laws gravity	5: Vectors 6: Newton's Laws 8: Apple and the Moon	3: Linear Motion 4: Second Law 5: Third Law	01/14 to 01/21	
3	energy conservation Laws	13: Conservation of Energy 14: Potential Energy 15: Conservation of Momentum	6: Momentum 7: Energy	01/21 to 01/28	1 Due: February 4
4	waves electricity	18: Waves 28: Static Electricity 29: Electric Field	19: Waves 20: Sound 21: Music	01/28 to 02/04	
5	magnetism e/m waves	34: Magnets 35: Magnetic Field 37: E/M Induction	22: Electrostatics 23: Current 24: Magnetism	02/04 to 02/11	
6	"continued"	38: Alternating Current 39: Maxwell's Eq. 40: Optics	25: Induction 26: Light 29: Light Waves	02/11 to 02/18	2 Due: February 25
7	relativity	41: Michelson-Morley 42: Lorentz Transformation 43: Velocity & Time	30: Emission 31: Quanta	02/18 to 02/25	
8	Einstein's universe	44: Mass, Momentum, Energy 24: Navigating in Space 25: Kepler to Einstein	35: Special Relativity 36: General Relativity	02/25 to 03/04	
9	thermodynamics	45: Temperature & Gas Laws 46: Engine of Nature 47: Entropy	15: Temperature & Heat 16: Heat Transfer 17: Phase 18: Thermodynamics	03/04 to 03/11	3 Due: March 18
10	quantum theory fields	49: Atom 50: Particles & Waves 51: Atoms to Quarks	11: Matter 32: Atoms &Quantum 33: Nucleus 34:Nuclear	03/11 to 03/18	

Text: Hewitt; Conceptual Physics

Programs: "The Mechanical Universe," programs 1-26
"Beyond the Mechanical Universe," programs 27-52