

# Course Schedule - Fall 2007

## Physics

100 **Thinking About Physics** credit: 1 hours.

Designed for students who want to prepare for PHYS 211 by improving their conceptual and problem solving skills. Shows how to analyze physical situations, describe them mathematically, and understand the meaning of the solutions. Examples will be drawn from material that will be covered in PHYS 211. PHYS 100 and PHYS 211 may be taken concurrently. Approval of the department is required to register. Prerequisite: Credit or concurrent registration in MATH 220 or MATH 221.

This course meets only for the last ten weeks of the semester. For registration authorization, come to the General Physics office (231 Loomis) during the week before the course is scheduled to begin. Exams in this course are given in the evening.

CRN	Type	Section	Time	Days	Location	Instructor
34792	discussion-recitation	M1	01:00 PM - 02:50 PM	M	room 132 Loomis Laboratory	Smith, A
34792: Departmental Approval RequiredMeets 15-Oct-07 - 07-Dec-07.						
34795	discussion-recitation	M3	03:00 PM - 04:50 PM	M	room 132 Loomis Laboratory	Smith, A
34795: Departmental Approval RequiredMeets 15-Oct-07 - 07-Dec-07.						
34798	discussion-recitation	M5	05:00 PM - 06:50 PM	M	room 132 Loomis Laboratory	Scott, M
34798: Departmental Approval RequiredMeets 15-Oct-07 - 07-Dec-07.						
34801	discussion-recitation	M7	07:00 PM - 08:50 PM	M	room 132 Loomis Laboratory	Scott, M
34801: Departmental Approval RequiredMeets 15-Oct-07 - 07-Dec-07.						
34809	discussion-recitation	T1	01:00 PM - 02:50 PM	T	room 132 Loomis Laboratory	Scott, M
34809: Departmental Approval RequiredMeets 15-Oct-07 - 07-Dec-07.						
34810	discussion-recitation	T3	03:00 PM - 04:50 PM	T	room 132 Loomis Laboratory	Scott, M
34810: Departmental Approval RequiredMeets 15-Oct-07 - 07-Dec-07.						
34811	discussion-recitation	T5	05:00 PM - 06:50 PM	T	room 132 Loomis Laboratory	Smith, A
34811: Departmental Approval RequiredMeets 15-Oct-07 - 07-Dec-07.						
34812	discussion-recitation	T7	07:00 PM - 08:50 PM	T	room 132 Loomis Laboratory	Smith, A

34812: Departmental Approval Required Meets 15-Oct-07 - 07-Dec-07.

101 **College Physics, Mech & Heat** credit: 5 hours.

Newton's Laws, work and energy, rotational motion, fluids, thermodynamics, and waves. A noncalculus-based course for students in the life sciences, preprofessional health programs, agriculture, and veterinary medicine. Credit is not given for both PHYS 101 and either PHYS 211 or PHYS 213. Prerequisite: Trigonometry.

This course satisfies the General Education Criteria for a Physical Sciences, and Quant Reasoning II course.

For students in the life sciences, pre-professional health programs, agriculture and veterinary medicine. Exams are given in the evening (during fall and spring semesters). Register for a lecture (A) section, a discussion (D) section and a laboratory (L) section.

CRN	Type	Section	Time	Days	Location	Instructor
34813	lecture	A1	01:00 PM - 01:50 PM	MW	room 141 Loomis Laboratory	Abbamonte, P
34813: Physical Sciences, and Quant Reasoning II course.						
34816	lecture	A2	02:00 PM - 02:50 PM	MW	room 141 Loomis Laboratory	Abbamonte, P
34816: Physical Sciences, and Quant Reasoning II course.						
34818	discussion-recitation	D2B	08:00 AM - 09:50 AM	T	room 143 Loomis Laboratory	Karliner, I
34818: Physical Sciences, and Quant Reasoning II course.						
34821	discussion-recitation	D2G	10:00 AM - 11:50 AM	T	room 236 Loomis Laboratory	Zhang, C
34821: Physical Sciences, and Quant Reasoning II course.						
43197	discussion-recitation	D2H	10:00 AM - 11:50 AM	T	room 143 Loomis Laboratory	Poore, G
43197: Physical Sciences, and Quant Reasoning II course.						
34824	discussion-recitation	D2N	01:00 PM - 02:50 PM	T	room 236 Loomis Laboratory	McCarn, A
34824: Physical Sciences, and Quant Reasoning II course.						
43195	discussion-recitation	D2P	01:00 PM - 02:50 PM	T	room 137 Loomis Laboratory	Kuroda, M
43195: Physical Sciences, and Quant Reasoning II course.						
34827	discussion-recitation	D2Y	07:00 PM - 08:50 PM	T	room 236 Loomis Laboratory	Khan, S
34827: Physical Sciences, and Quant Reasoning II course.						

34830	discussion-recitation	D3B	08:00 AM - 09:50 AM	W	room 236 Loomis Laboratory	Sussman, D
34830: Physical Sciences, and Quant Reasoning II course.						
34835	discussion-recitation	D3G	10:00 AM - 11:50 AM	W	room 236 Loomis Laboratory	Zhang, C
34835: Physical Sciences, and Quant Reasoning II course.						
34839	discussion-recitation	D3S	03:00 PM - 04:50 PM	W	room 236 Loomis Laboratory	Khan, S
34839: Physical Sciences, and Quant Reasoning II course.						
46110	discussion-recitation	D3V	05:00 PM - 06:50 PM	W	room 143 Loomis Laboratory	Suksombat, S
46110: Physical Sciences, and Quant Reasoning II course.						
34845	discussion-recitation	D3Y	07:00 PM - 08:50 PM	W	room 236 Loomis Laboratory	Suksombat, S
34845: Physical Sciences, and Quant Reasoning II course.						
45836	discussion-recitation	D3Z	07:00 PM - 08:50 PM	W	room 143 Loomis Laboratory	Cortes Gonzalez, A
45836: Physical Sciences, and Quant Reasoning II course.						
34850	discussion-recitation	D4B	08:00 AM - 09:50 AM	R	room 236 Loomis Laboratory	Cortes Gonzalez, A
34850: Physical Sciences, and Quant Reasoning II course.						
48149	discussion-recitation	D4C	08:00 AM - 09:50 AM	R	room 143 Loomis Laboratory	Kuroda, M
48149: Physical Sciences, and Quant Reasoning II course.						
34854	discussion-recitation	D4G	10:00 AM - 11:50 AM	R	room 236 Loomis Laboratory	Zhang, C
34854: Physical Sciences, and Quant Reasoning II course.						
43198	discussion-recitation	D4H	10:00 AM - 11:50 AM	R	room 143 Loomis Laboratory	Oz, M
43198: Physical Sciences, and Quant Reasoning II course.						
34858	discussion-recitation	D4N	01:00 PM - 02:50 PM	R	room 236 Loomis Laboratory	Suksombat, S
34858: Physical Sciences, and Quant Reasoning II course.						
43196	discussion-recitation	D4P	01:00 PM - 02:50 PM	R	room 143 Loomis Laboratory	McCarn, A

43196: Physical Sciences, and Quant Reasoning II course.						
34862	discussion-recitation	D4S	03:00 PM - 04:50 PM	R	room 236 Loomis Laboratory	Khan, S
34862: Physical Sciences, and Quant Reasoning II course.						
34867	discussion-recitation	D4V	05:00 PM - 06:50 PM	R	room 236 Loomis Laboratory	Oz, M
34867: Physical Sciences, and Quant Reasoning II course.						
48150	discussion-recitation	D4X	05:00 PM - 06:50 PM	R	room 137 Loomis Laboratory	McCarn, A
48150: Physical Sciences, and Quant Reasoning II course.						
47575	discussion-recitation	D4Y	07:00 PM - 08:50 PM	R	room 236 Loomis Laboratory	Oz, M
47575: Physical Sciences, and Quant Reasoning II course.						
34871	discussion-recitation	D5B	08:00 AM - 09:50 AM	F	room 236 Loomis Laboratory	Sussman, D
34871: Physical Sciences, and Quant Reasoning II course.						
34875	discussion-recitation	D5G	10:00 AM - 11:50 AM	F	room 236 Loomis Laboratory	Poore, G
34875: Physical Sciences, and Quant Reasoning II course.						
49659	discussion-recitation	D5H	10:00 AM - 11:50 AM	F	room 137 Loomis Laboratory	Kuroda, M
49659: Physical Sciences, and Quant Reasoning II course.						
34877	discussion-recitation	D5N	01:00 PM - 02:50 PM	F	room 236 Loomis Laboratory	Sussman, D
34877: Physical Sciences, and Quant Reasoning II course.						
45891	laboratory	L1B	08:00 AM - 10:50 AM	M	room 64 Loomis Laboratory	Salovich, N
45891: Physical Sciences, and Quant Reasoning II course.						
34884	laboratory	L1C	08:00 AM - 10:50 AM	M	room 32 Loomis Laboratory	Lu, M
34884: Physical Sciences, and Quant Reasoning II course.						
34888	laboratory	L1S	03:00 PM - 05:50 PM	M	room 64 Loomis Laboratory	Delgado, M
34888: Physical Sciences, and Quant Reasoning II course.						

48153	laboratory	L1U	03:00 PM - 05:50 PM	M	room 32 Loomis Laboratory	Skinner, S
48153: Physical Sciences, and Quant Reasoning II course.						
34890	laboratory	L1Y	07:00 PM - 09:50 PM	M	room 64 Loomis Laboratory	Delgado, M
34890: Physical Sciences, and Quant Reasoning II course.						
48152	laboratory	L1Z	07:00 PM - 09:50 PM	M	room 32 Loomis Laboratory	Skinner, S
48152: Physical Sciences, and Quant Reasoning II course.						
43795	laboratory	L2B	08:00 AM - 10:50 AM	T	room 64 Loomis Laboratory	Jain, R
43795: Physical Sciences, and Quant Reasoning II course.						
49660	laboratory	L2C	08:00 AM - 10:50 AM	T	room 32 Loomis Laboratory	Kerns, B
49660: Physical Sciences, and Quant Reasoning II course.						
43796	laboratory	L2N	11:00 AM - 01:50 PM	T	room 64 Loomis Laboratory	Kerns, B
43796: Physical Sciences, and Quant Reasoning II course.						
49661	laboratory	L2P	11:00 AM - 01:50 PM	T	room 32 Loomis Laboratory	Huang, P
49661: Physical Sciences, and Quant Reasoning II course.						
34895	laboratory	L3B	09:00 AM - 11:50 AM	W	room 64 Loomis Laboratory	Wandelt, B
34895: Physical Sciences, and Quant Reasoning II course.						
34892	laboratory	L3C	09:00 AM - 11:50 AM	W	room 32 Loomis Laboratory	Salovich, N
34892: Physical Sciences, and Quant Reasoning II course.						
34896	laboratory	L3S	03:00 PM - 05:50 PM	W	room 64 Loomis Laboratory	Lu, M
34896: Physical Sciences, and Quant Reasoning II course.						
43797	laboratory	L3U	03:00 PM - 05:50 PM	W	room 32 Loomis Laboratory	Delgado, M
43797: Physical Sciences, and Quant Reasoning II course.						
34452	laboratory	L3Y	07:00 PM - 09:50 PM	W	room 64 Loomis Laboratory	Nguyen Hoang, N

34452: Physical Sciences, and Quant Reasoning II course.						
45688	laboratory	L3Z	07:00 PM - 09:50 PM	W	room 32 Loomis Laboratory	Skinner, S
45688: Physical Sciences, and Quant Reasoning II course.						
34455	laboratory	L4B	09:00 AM - 11:50 AM	R	room 64 Loomis Laboratory	Miles, P
34455: Physical Sciences, and Quant Reasoning II course.						
34887	laboratory	L4C	09:00 AM - 11:50 AM	R	room 32 Loomis Laboratory	Inderhees, K
34887: Physical Sciences, and Quant Reasoning II course.						
34457	laboratory	L4N	12:00 PM - 02:50 PM	R	room 64 Loomis Laboratory	Mohapatra, C
34457: Physical Sciences, and Quant Reasoning II course.						
34881	laboratory	L4P	12:00 PM - 02:50 PM	R	room 32 Loomis Laboratory	Inderhees, K
34881: Physical Sciences, and Quant Reasoning II course.						
34459	laboratory	L4S	03:00 PM - 05:50 PM	R	room 64 Loomis Laboratory	Miles, P
34459: Physical Sciences, and Quant Reasoning II course.						
43793	laboratory	L4U	03:00 PM - 05:50 PM	R	room 32 Loomis Laboratory	Huang, P
43793: Physical Sciences, and Quant Reasoning II course.						
34460	laboratory	L4Y	07:00 PM - 09:50 PM	R	room 64 Loomis Laboratory	Lu, M
34460: Physical Sciences, and Quant Reasoning II course.						
45835	laboratory	L4Z	07:00 PM - 09:50 PM	R	room 32 Loomis Laboratory	Huang, P
45835: Physical Sciences, and Quant Reasoning II course.						
34464	laboratory	L5B	08:00 AM - 10:50 AM	F	room 64 Loomis Laboratory	Nguyen Hoang, N
34464: Physical Sciences, and Quant Reasoning II course.						
46164	laboratory	L5C	08:00 AM - 10:50 AM	F	room 32 Loomis Laboratory	Jain, R
46164: Physical Sciences, and Quant Reasoning II course.						

34461	laboratory	L5G	11:00 AM - 01:50 PM	F	room 64 Loomis Laboratory	Jain, R
34461: Physical Sciences, and Quant Reasoning II course.						
47576	laboratory	L5H	11:00 AM - 01:50 PM	F	room 32 Loomis Laboratory	Salovich, N
47576: Physical Sciences, and Quant Reasoning II course.						
34462	laboratory	L5S	02:00 PM - 04:50 PM	F	room 64 Loomis Laboratory	Kerns, B
34462: Physical Sciences, and Quant Reasoning II course.						
48055	laboratory	L5T	02:00 PM - 04:50 PM	F	room 32 Loomis Laboratory	Mohapatra, C
48055: Physical Sciences, and Quant Reasoning II course.						

102 **College Physics, E&M & Modern** credit: 5 hours.

Electric forces and fields, electric potential, electric circuits, magnetic forces and fields, geometrical optics, relativity, and modern physics. A noncalculus-based course for students in life sciences, preprofessional health programs, agriculture, and veterinary medicine. Credit is not given for both PHYS 102 and either PHYS 212 or PHYS 214.

Prerequisite: PHYS 101.

This course satisfies the General Education Criteria for a Physical Sciences, and Quant Reasoning II course.

For students in the life sciences, pre-professional health programs, agriculture and veterinary medicine. Exams are given in the evening (during fall and spring semesters). Register for a lecture (A) section, a discussion (D) section and a laboratory (L) section.

CRN	Type	Section	Time	Days	Location	Instructor
34469	lecture	A1	09:00 AM - 09:50 AM	MW	room 151 Loomis Laboratory	Stelzer, T
34469: Physical Sciences, and Quant Reasoning II course.						
34471	lecture	A2	10:00 AM - 10:50 AM	MW	room 151 Loomis Laboratory	Stelzer, T
34471: Physical Sciences, and Quant Reasoning II course.						
34473	discussion-recitation	D2B	08:00 AM - 09:50 AM	T	room 137 Loomis Laboratory	Lu, B
34473: Physical Sciences, and Quant Reasoning II course.						
47984	discussion-recitation	D2C	08:00 AM - 09:50 AM	T	room 236 Loomis Laboratory	Golding, I
47984: Physical Sciences, and Quant Reasoning II course.						

50254	discussion-recitation	D2E	08:00 AM - 09:50 AM	T	room 242 Loomis Laboratory	Christie, D
50254: Physical Sciences, and Quant Reasoning II course.						
34475	discussion-recitation	D2G	10:00 AM - 11:50 AM	T	room 137 Loomis Laboratory	Christie, D
34475: Physical Sciences, and Quant Reasoning II course.						
34500	discussion-recitation	D2S	03:00 PM - 04:50 PM	T	room 236 Loomis Laboratory	Biava, D
34500: Physical Sciences, and Quant Reasoning II course.						
34561	discussion-recitation	D2U	03:00 PM - 04:50 PM	T	room 137 Loomis Laboratory	Torigoe, E
34561: Physical Sciences, and Quant Reasoning II course.						
34502	discussion-recitation	D2V	05:00 PM - 06:50 PM	T	room 137 Loomis Laboratory	Sanchez, A
34502: Physical Sciences, and Quant Reasoning II course.						
34506	discussion-recitation	D2Y	07:00 PM - 08:50 PM	T	room 137 Loomis Laboratory	Biava, D
34506: Physical Sciences, and Quant Reasoning II course.						
34529	discussion-recitation	D3H	11:00 AM - 12:50 PM	W	room 137 Loomis Laboratory	Christie, D
34529: Physical Sciences, and Quant Reasoning II course.						
34533	discussion-recitation	D3N	01:00 PM - 02:50 PM	W	room 137 Loomis Laboratory	Lu, B
34533: Physical Sciences, and Quant Reasoning II course.						
34538	discussion-recitation	D3P	01:00 PM - 02:50 PM	W	room 236 Loomis Laboratory	Biava, D
34538: Physical Sciences, and Quant Reasoning II course.						
34547	discussion-recitation	D3S	03:00 PM - 04:50 PM	W	room 137 Loomis Laboratory	Sanchez, A
34547: Physical Sciences, and Quant Reasoning II course.						
34548	discussion-recitation	D3V	05:00 PM - 06:50 PM	W	room 236 Loomis Laboratory	Lu, B
34548: Physical Sciences, and Quant Reasoning II course.						
50255	discussion-recitation	D3Y	07:00 PM - 08:50 PM	W	room 242 Loomis Laboratory	Sanchez, A

50255: Physical Sciences, and Quant Reasoning II course.						
34550	laboratory	L1G	11:00 AM - 01:50 PM	M	room 258 Loomis Laboratory	Stupca, M
34550: Physical Sciences, and Quant Reasoning II course.						
34551	laboratory	L1N	02:00 PM - 04:50 PM	M	room 258 Loomis Laboratory	Cook, J
34551: Physical Sciences, and Quant Reasoning II course.						
34552	laboratory	L1Y	07:00 PM - 09:50 PM	M	room 258 Loomis Laboratory	Fang, K
34552: Physical Sciences, and Quant Reasoning II course.						
34553	laboratory	L2B	08:00 AM - 10:50 AM	T	room 258 Loomis Laboratory	Cook, J
34553: Physical Sciences, and Quant Reasoning II course.						
34554	laboratory	L2G	11:00 AM - 01:50 PM	T	room 258 Loomis Laboratory	Fang, K
34554: Physical Sciences, and Quant Reasoning II course.						
50253	laboratory	L2N	02:00 PM - 04:50 PM	T	room 258 Loomis Laboratory	Spring, B
50253: Physical Sciences, and Quant Reasoning II course.						
34549	laboratory	L4E	09:00 AM - 11:50 AM	R	room 258 Loomis Laboratory	Errede, D
34549: Physical Sciences, and Quant Reasoning II course.						
34555	laboratory	L4N	01:00 PM - 03:50 PM	R	room 258 Loomis Laboratory	Stupca, M
34555: Physical Sciences, and Quant Reasoning II course.						
47983	laboratory	L4V	04:00 PM - 06:50 PM	R	room 258 Loomis Laboratory	Spring, B
47983: Physical Sciences, and Quant Reasoning II course.						
34562	laboratory	L4Y	07:00 PM - 09:50 PM	R	room 258 Loomis Laboratory	Zhai, X
34562: Physical Sciences, and Quant Reasoning II course.						
34557	laboratory	L5B	08:00 AM - 10:50 AM	F	room 258 Loomis Laboratory	Spring, B
34557: Physical Sciences, and Quant Reasoning II course.						

34558	laboratory	L5G	11:00 AM - 01:50 PM	F	room 258 Loomis Laboratory	Zhai, X
34558: Physical Sciences, and Quant Reasoning II course.						
34559	laboratory	L5N	02:00 PM - 04:50 PM	F	room 258 Loomis Laboratory	Cook, J
34559: Physical Sciences, and Quant Reasoning II course.						
50256	laboratory	L5V	05:00 PM - 07:50 PM	F	room 258 Loomis Laboratory	Fang, K
50256: Physical Sciences, and Quant Reasoning II course.						

110 **Physics Careers** credit: 0 hours.

Provides an understanding of how undergraduate training in physics can serve as a foundation for careers of both a traditional and non-traditional character in today's world. Includes outside speakers who are representative of the broad spectrum of possible careers after receiving a physics degree. Approved for S/U grading only.

CRN	Type	Section	Time	Days	Location	Instructor
40084	conference	A	03:30 PM - 04:50 PM	W	room 141 Loomis Laboratory	Van Harlingen, D

140 **How Things Work** credit: 3 hours.

Nonmathematical lecture-demonstration course for nonscience students, underscoring the generality and ubiquity of basic physical laws in understanding commonplace phenomena: musical instruments, photography, electric and electronic circuits, television, motors, engines, etc. Credit is not given to engineering majors.

This course satisfies the General Education Criteria for a Physical Sciences, and Quant Reasoning II course.

Exams are given in the evening. Register for a lecture (A) section and a discussion (D) section.

CRN	Type	Section	Time	Days	Location	Instructor
34767	lecture	A1	12:30 PM - 01:45 PM	TR	room 141 Loomis Laboratory	Demarco, B
34767: Physical Sciences, and Quant Reasoning II course.						
43027	lecture	A2	02:00 PM - 03:15 PM	TR	room 141 Loomis Laboratory	Demarco, B
43027: Physical Sciences, and Quant Reasoning II course.						
34774	discussion-recitation	D1B	08:00 AM - 08:50 AM	M	room 31 Loomis Laboratory	Carr, R
34774: Physical Sciences, and Quant Reasoning II course.						

34778	discussion-recitation	D1C	09:00 AM - 09:50 AM	M	room 31 Loomis Laboratory	Carr, R
34778: Physical Sciences, and Quant Reasoning II course.						
34781	discussion-recitation	D1G	10:00 AM - 10:50 AM	M	room 31 Loomis Laboratory	Olheiser, T
34781: Physical Sciences, and Quant Reasoning II course.						
34785	discussion-recitation	D1H	11:00 AM - 11:50 AM	M	room 31 Loomis Laboratory	Ngai, W
34785: Physical Sciences, and Quant Reasoning II course.						
43686	discussion-recitation	D1J	12:00 PM - 12:50 PM	M	room 31 Loomis Laboratory	Ngai, W
43686: Physical Sciences, and Quant Reasoning II course.						
43676	discussion-recitation	D1N	01:00 PM - 01:50 PM	M	room 31 Loomis Laboratory	Bonges, M
43676: Physical Sciences, and Quant Reasoning II course.						
43675	discussion-recitation	D1P	02:00 PM - 02:50 PM	M	room 31 Loomis Laboratory	Maffeo, C
43675: Physical Sciences, and Quant Reasoning II course.						
43673	discussion-recitation	D1S	03:00 PM - 03:50 PM	M	room 31 Loomis Laboratory	Maffeo, C
43673: Physical Sciences, and Quant Reasoning II course.						
43672	discussion-recitation	D1U	04:00 PM - 04:50 PM	M	room 31 Loomis Laboratory	Maffeo, C
43672: Physical Sciences, and Quant Reasoning II course.						
34805	discussion-recitation	D1V	05:00 PM - 05:50 PM	M	room 31 Loomis Laboratory	Maffeo, C
34805: Physical Sciences, and Quant Reasoning II course.						
34806	discussion-recitation	D1X	06:00 PM - 06:50 PM	M	room 31 Loomis Laboratory	Kondov, S
34806: Physical Sciences, and Quant Reasoning II course.						
34807	discussion-recitation	D1Y	07:00 PM - 07:50 PM	M	room 31 Loomis Laboratory	Kondov, S
34807: Physical Sciences, and Quant Reasoning II course.						
34808	discussion-recitation	D1Z	08:00 PM - 08:50 PM	M	room 31 Loomis Laboratory	Kondov, S

34808: Physical Sciences, and Quant Reasoning II course.						
43678	discussion-recitation	D2B	08:00 AM - 08:50 AM	T	room 31 Loomis Laboratory	Carr, R
43678: Physical Sciences, and Quant Reasoning II course.						
43677	discussion-recitation	D2C	09:00 AM - 09:50 AM	T	room 31 Loomis Laboratory	Carr, R
43677: Physical Sciences, and Quant Reasoning II course.						
34819	discussion-recitation	D2G	10:00 AM - 10:50 AM	T	room 31 Loomis Laboratory	Maffeo, C
34819: Physical Sciences, and Quant Reasoning II course.						
34820	discussion-recitation	D2H	11:00 AM - 11:50 AM	T	room 31 Loomis Laboratory	Maffeo, C
34820: Physical Sciences, and Quant Reasoning II course.						
43680	discussion-recitation	D3C	09:00 AM - 09:50 AM	W	room 31 Loomis Laboratory	Youn, S
43680: Physical Sciences, and Quant Reasoning II course.						
34814	discussion-recitation	D3G	10:00 AM - 10:50 AM	W	room 31 Loomis Laboratory	Olheiser, T
34814: Physical Sciences, and Quant Reasoning II course.						
34817	discussion-recitation	D3H	11:00 AM - 11:50 AM	W	room 31 Loomis Laboratory	Olheiser, T
34817: Physical Sciences, and Quant Reasoning II course.						
34822	discussion-recitation	D3J	12:00 PM - 12:50 PM	W	room 31 Loomis Laboratory	Olheiser, T
34822: Physical Sciences, and Quant Reasoning II course.						
43685	discussion-recitation	D3N	01:00 PM - 01:50 PM	W	room 31 Loomis Laboratory	Bonges, M
43685: Physical Sciences, and Quant Reasoning II course.						
43684	discussion-recitation	D3P	02:00 PM - 02:50 PM	W	room 31 Loomis Laboratory	Bonges, M
43684: Physical Sciences, and Quant Reasoning II course.						
43683	discussion-recitation	D3S	03:00 PM - 03:50 PM	W	room 31 Loomis Laboratory	Youn, S
43683: Physical Sciences, and Quant Reasoning II course.						

43681	discussion-recitation	D3U	04:00 PM - 04:50 PM	W	room 31 Loomis Laboratory	Youn, S
43681: Physical Sciences, and Quant Reasoning II course.						
43682	discussion-recitation	D3V	05:00 PM - 05:50 PM	W	room 31 Loomis Laboratory	Youn, S
43682: Physical Sciences, and Quant Reasoning II course.						
43679	discussion-recitation	D3X	06:00 PM - 06:50 PM	W	room 31 Loomis Laboratory	Kondov, S
43679: Physical Sciences, and Quant Reasoning II course.						
43977	discussion-recitation	D3Y	07:00 PM - 07:50 PM	W	room 31 Loomis Laboratory	Kondov, S
43977: Physical Sciences, and Quant Reasoning II course.						
43978	discussion-recitation	D3Z	08:00 PM - 08:50 PM	W	room 31 Loomis Laboratory	Kondov, S
43978: Physical Sciences, and Quant Reasoning II course.						
34789	discussion-recitation	D4B	08:00 AM - 08:50 AM	R	room 31 Loomis Laboratory	Andrews, J
34789: Physical Sciences, and Quant Reasoning II course.						
34802	discussion-recitation	D4C	09:00 AM - 09:50 AM	R	room 31 Loomis Laboratory	Andrews, J
34802: Physical Sciences, and Quant Reasoning II course.						
34803	discussion-recitation	D4G	10:00 AM - 10:50 AM	R	room 31 Loomis Laboratory	Ngai, W
34803: Physical Sciences, and Quant Reasoning II course.						
34804	discussion-recitation	D4H	11:00 AM - 11:50 AM	R	room 31 Loomis Laboratory	Ngai, W
34804: Physical Sciences, and Quant Reasoning II course.						
43979	discussion-recitation	D4J	12:00 PM - 12:50 PM	R	room 31 Loomis Laboratory	Ngai, W
43979: Physical Sciences, and Quant Reasoning II course.						
43980	discussion-recitation	D4N	01:00 PM - 01:50 PM	R	room 31 Loomis Laboratory	Andrews, J
43980: Physical Sciences, and Quant Reasoning II course.						
43981	discussion-recitation	D4P	02:00 PM - 02:50 PM	R	room 31 Loomis Laboratory	Andrews, J

43981: Physical Sciences, and Quant Reasoning II course.						
43982	discussion-recitation	D4S	03:00 PM - 03:50 PM	R	room 31 Loomis Laboratory	Andrews, J
43982: Physical Sciences, and Quant Reasoning II course.						
43983	discussion-recitation	D4U	04:00 PM - 04:50 PM	R	room 31 Loomis Laboratory	Ngai, W
43983: Physical Sciences, and Quant Reasoning II course.						
43984	discussion-recitation	D4V	05:00 PM - 05:50 PM	R	room 31 Loomis Laboratory	Andrews, J
43984: Physical Sciences, and Quant Reasoning II course.						
43985	discussion-recitation	D4X	06:00 PM - 06:50 PM	R	room 31 Loomis Laboratory	McKinney, C
43985: Physical Sciences, and Quant Reasoning II course.						
43986	discussion-recitation	D4Y	07:00 PM - 07:50 PM	R	room 31 Loomis Laboratory	McKinney, C
43986: Physical Sciences, and Quant Reasoning II course.						
43987	discussion-recitation	D4Z	08:00 PM - 08:50 PM	R	room 31 Loomis Laboratory	McKinney, C
43987: Physical Sciences, and Quant Reasoning II course.						
34823	discussion-recitation	D5B	08:00 AM - 08:50 AM	F	room 31 Loomis Laboratory	Carr, R
34823: Physical Sciences, and Quant Reasoning II course.						
34825	discussion-recitation	D5C	09:00 AM - 09:50 AM	F	room 31 Loomis Laboratory	Carr, R
34825: Physical Sciences, and Quant Reasoning II course.						
34828	discussion-recitation	D5G	10:00 AM - 10:50 AM	F	room 31 Loomis Laboratory	Olheiser, T
34828: Physical Sciences, and Quant Reasoning II course.						
34831	discussion-recitation	D5H	11:00 AM - 11:50 AM	F	room 31 Loomis Laboratory	Olheiser, T
34831: Physical Sciences, and Quant Reasoning II course.						
34833	discussion-recitation	D5J	12:00 PM - 12:50 PM	F	room 31 Loomis Laboratory	Youn, S
34833: Physical Sciences, and Quant Reasoning II course.						

34837	discussion-recitation	D5N	01:00 PM - 01:50 PM	F	room 31 Loomis Laboratory	Youn, S
34837: Physical Sciences, and Quant Reasoning II course.						
34841	discussion-recitation	D5P	02:00 PM - 02:50 PM	F	room 31 Loomis Laboratory	McKinney, C
34841: Physical Sciences, and Quant Reasoning II course.						
34844	discussion-recitation	D5S	03:00 PM - 03:50 PM	F	room 31 Loomis Laboratory	McKinney, C
34844: Physical Sciences, and Quant Reasoning II course.						
34848	discussion-recitation	D5U	04:00 PM - 04:50 PM	F	room 31 Loomis Laboratory	McKinney, C
34848: Physical Sciences, and Quant Reasoning II course.						

141 **Special Problems** credit: 1 hours.

Special problems in physics: discussions and independent study. Supplement to PHYS 140. Prerequisite: Credit or concurrent registration in PHYS 140.

CRN	Type	Section	Time	Days	Location	Instructor
10140	independent study		ARRANGED			
10140: Instructor Approval Required						
10140: To register for PHYS 141, use the PHYS 141 CRN (available from the departmental undergraduate records office) specific to the instructor with whom you have arranged to study. (You cannot register under the general CRN 10140.)						

199 **Undergraduate Open Seminar** credit: 1 to 5 hours.

Approved for both letter and S/U grading. May be repeated.

CRN	Type	Section	Time	Days	Location	Instructor
10145	independent study		ARRANGED			
10145: Instructor Approval Required INDEPENDENT STUDY. To register for independent study under PHYS 199, use the PHYS 199 CRN (available from the departmental undergraduate records office) specific to the instructor with whom you have arranged to work. (You cannot register under the general CRN 10145.)						
34889	laboratory-discussion	BB	03:00 PM - 04:50 PM	M	room 236 Loomis Laboratory	Nathan, A

<p>34889: 2 hoursThe Physics of BaseballDiscovery course.THE PHYSICS OF BASEBALL, 2 hours. The course covers various items in the physics of baseball, loosely following the seminal book of the same name by Robert K. Adair. A partial list of topics includes: 1. Review of fundamental physics (momentum, energy, angular momentum) 2. The bounce of a ball 3. How does a baseball bat work? 4. Characterizing and regulating the performance of baseball bats 5. Aerodynamics of a baseball in flight 6. How do fielders judge fly balls? 7. Baseball and statistics. There will be a "field" trip to an Illini baseball game sometime in April. First Year Discovery Program Course. Registration restricted to freshmen. Students should enroll in only one Discovery course. THE FIRST MEETING OF PHYS 199BB WILL BE ON WEDNESDAY (SCHEDULED AS A MONDAY), AUGUST 22.</p>						
34865	laboratory-discussion	BCS	04:00 PM - 05:20 PM	W	room 257 Loomis Laboratory	Hubler, A
<p>34865: 1 hoursBehavior of Complex SystemsDiscovery course.BEHAVIOR OF COMPLEX SYSTEMS: CHAOS, FRACTALS AND ARTIFICIAL LIFE, 1 hour. The behavior of complicated systems with many parts will be explored with hands-on computer simulations and lab experiments. Students will experiment with lightning, turbulence, explosions, and human rhythms as well as use simple computer models to imitate their irregular and symmetric patterns and dynamics. Students will develop an intuition as to why isolated complex systems prefer harmony and symmetry, whereas competing complex systems prefer chaos. Discussions will include applications of this within business, engineering and social sciences. First Year Discovery Program Course. Registration restricted to freshmen. Students should enroll in only one Discovery course. THE FIRST MEETING OF PHYS 199 BCS IS ON AUGUST 29.</p>						
34855	laboratory-discussion	ESP	04:00 PM - 05:20 PM	T	room 144 Loomis Laboratory	Pitts, K
<p>34855: 1 hoursScience and PseudoscienceDiscovery course.SCIENCE AND PSEUDOSCIENCE, 1 hour. The world we live in continues to develop at an amazing rate, with much of that development fueled by science and technology. Despite the overwhelming impact that scientific advances have on our society, a large number of people continue to hold irrational, unsupported beliefs in things like extrasensory perception, alien abductions and psychic crime-solvers. This one hour course will take a critical look at some of these beliefs from the standpoint of scientific inquiry and exploration. We will discuss the scientific method, how science progresses and the types of argumentative fallacies that pervade the pseudoscientific community. In addition, we will discuss examples of good science, and show how the scientific method is self-correcting. Students will have an opportunity to research paranormal claims, as well as play "devil's advocate" during in-class debates. This course is aimed at nonscientists (although science majors could benefit from the course as well) with the specific goals of teaching students how to be thoughtful, skeptical consumers of information and the importance of the scientific method. First Year Discovery Program Course. Registration restricted to freshmen. Students should enroll in only one Discovery course.</p>						
34870	lecture-discussion	HM	04:00 PM - 05:50 PM	M	room 257 Loomis Laboratory	Pitts, K
<p>34870: 1 hoursHonors MechanicsHONORS SEMINAR: TOPICS IN MECHANICS. PREREQUISITES: CONCURRENT REGISTRATION IN PHYS 211 AND CONSENT OF INSTRUCTOR. PHYS 199HM CAN BE USED TO SATISFY THE HONORS COMPONENT OF PHYS 211. PHYS 199HM is the honors supplement to PHYS 211 and is intended for those students intending to major in physics or who have a strong interest in the subject. Areas to be addressed include rotational and central force motion, non-inertial frames, non-linear systems and post-Newtonian mechanics. The use of simple visualization tools such as Mathematica and Excel will be encouraged. THE FIRST MEETING OF PHYS 199HM IS WEDNESDAY (SCHEDULED AS A MONDAY) AUGUST 22.</p>						
34876	lecture-discussion	HO	01:00 PM - 02:50 PM	M	room 139 Loomis Laboratory	Pitts, K
<p>34876: 1 hoursHonors Electricity &amp; MagnetismHONORS SEMINAR: TOPICS IN ELECTRICITY AND MAGNETISM. PREREQUISITES: PHYS 211, CONCURRENT REGISTRATION IN PHYS 212, AND CONSENT</p>						

OF INSTRUCTOR. PHYS 199HO CAN BE USED TO SATISFY THE HONORS COMPONENT OF PHYS 212. Students investigate special topics in electricity and magnetism. Through weekly meetings (similar in format to the discussion sections of Physics 211 and 212), students will derive for themselves some of the surprising features of our post-classical physical world. For example, the need for special relativity, the existence of magnetic fields, and the origin of electromagnetic radiation are consequences of simple observations such as the constancy of the speed of light. Other topics will include the nature of Gauss' law and Maxwell's equations, potentials and superposition, amplifiers, analog computers, and the role of quantum mechanics in electrodynamics. PHYS 199HO is intended for students who have been comfortable with the level of difficulty of PHYS 211, and whose math skills are fairly strong. It allows students to confront in greater depth some of the most interesting intellectual issues in classical electrodynamics. The course will use calculus as a problem-solving tool. THE FIRST MEETING OF PHYS 199HO IS WEDNESDAY (SCHEDULED AS A MONDAY) AUGUST 22.

34885	lecture-discussion	HT	03:30 PM - 05:20 PM	M	room 279 Loomis Laboratory	Thaler, J
34885: 1 hours Honors Thermal & Quantum Phys HONORS SEMINAR: TOPICS IN HEAT, THERMODYNAMICS, AND MODERN PHYSICS. PREREQUISITES: PHYS 211 AND PHYS 212 AND CONCURRENT REGISTRATION IN PHYS 214 AND PHYS 213 AND CONSENT OF INSTRUCTOR. PHYS 199HT CAN BE USED TO SATISFY THE HONORS COMPONENT OF PHYS 214 AND PHYS 213. PHYS 199HT is the honors supplement to PHYS 214/213 and is intended for those students either planning to major/minor in physics or having a strong interest in the subject. Areas to be covered during PHYS 214 include particle scattering, photon quantum states, simple approximation methods (e.g., variational methods), particle exchange, and quantum statistics. Areas to be covered during PHYS 213 include diffusion and heat conduction, the Maxwell-Boltzmann distribution and the ideal gas, the Planck distribution and radiation, free energy and the chemical potential, and quantum gases. THE FIRST MEETING OF PHYS 199HT IS WEDNESDAY (SCHEDULED AS A MONDAY) AUGUST 22.						
34893	discussion-recitation	MC	07:00 PM - 08:50 PM	R	room 132 Loomis Laboratory	Jasti, H
34893: 1 hours Enrichment Electricity & Mag PHYS 199MC is for students enrolled in FA07 PHYS 212 who took SP07 PHYS 199M.						
34859	laboratory-discussion	POM	01:00 PM - 02:50 PM	F	room 6105 Engineering Sciences Bldg	Errede, S
34859: 1 hours Physics of Music & Instruments Discovery course. PHYSICS OF MUSIC / PHYSICS OF MUSICAL INSTRUMENTS, 1 hour. This course will cover the following topics and will have accompanying lab demonstrations and experimental setups for hands-on direct learning experiences for the students: the physics of sound (propagation of sound waves), the physics of hearing (psycho-acoustics), the physics of music (all musical styles, and music in the natural world -- living organisms and physical processes), the physics of musical instruments (brass, wind, strings percussion, song, electronic, computer and beyond). First Year Discovery Program Course. Registration restricted to freshmen. Students should enroll in only one Discovery course.						

211 **Univ Physics, Mechanics** credit: 4 hours.

Newton's Laws, work and energy, static properties and fluids, oscillations, transverse waves, systems of particles, and rotations. Lectures with demonstrations, discussions and laboratory. For students in engineering, mathematics, physics and chemistry. Credit is not given for both PHYS 211 and PHYS 101. Prerequisite: MATH 220 or MATH 221; credit or concurrent registration in MATH 231 (formerly MATH 230).

This course satisfies the General Education Criteria for a Physical Sciences, and Quant Reasoning II course.

For students in engineering, mathematics, physics and chemistry. Exams are given in the evening (during fall and spring semesters). Register for a lecture (A) section, a discussion (D) section and a laboratory (L) section. Engineering students must obtain a dean's approval to drop this course after the second week of instruction.

CRN	Type	Section	Time	Days	Location	Instructor
34564	lecture	A1	08:30 AM - 09:45 AM	MW	room 141 Loomis Laboratory	Selen, M
34564: Physical Sciences, and Quant Reasoning II course.						
34566	lecture	A2	10:00 AM - 11:15 AM	MW	room 141 Loomis Laboratory	Selen, M
34566: Physical Sciences, and Quant Reasoning II course.						
34569	discussion-recitation	D2B	08:00 AM - 09:50 AM	T	room 147 Loomis Laboratory	Aksimentiev, O
34569: Physical Sciences, and Quant Reasoning II course.						
34586	discussion-recitation	D2G	10:00 AM - 11:50 AM	T	room 147 Loomis Laboratory	McArdle, T
34586: Physical Sciences, and Quant Reasoning II course.						
34590	discussion-recitation	D2N	01:00 PM - 02:50 PM	T	room 147 Loomis Laboratory	Dove, A
34590: Physical Sciences, and Quant Reasoning II course.						
34592	discussion-recitation	D2S	03:00 PM - 04:50 PM	T	room 147 Loomis Laboratory	Dove, A
34592: Physical Sciences, and Quant Reasoning II course.						
34595	discussion-recitation	D2V	05:00 PM - 06:50 PM	T	room 147 Loomis Laboratory	Mears, P
34595: Physical Sciences, and Quant Reasoning II course.						
34598	discussion-recitation	D2Y	07:00 PM - 08:50 PM	T	room 147 Loomis Laboratory	Mears, P
34598: Physical Sciences, and Quant Reasoning II course.						
34601	discussion-recitation	D3B	08:00 AM - 09:50 AM	W	room 147 Loomis Laboratory	Schwenk, D
34601: Physical Sciences, and Quant Reasoning II course.						
34604	discussion-recitation	D3G	10:00 AM - 11:50 AM	W	room 147 Loomis Laboratory	Dove, A
34604: Physical Sciences, and Quant Reasoning II course.						
34608	discussion-recitation	D3N	01:00 PM - 02:50 PM	W	room 147 Loomis Laboratory	Yoscovits, Z

34608: Physical Sciences, and Quant Reasoning II course.						
34611	discussion-recitation	D3S	03:00 PM - 04:50 PM	W	room 147 Loomis Laboratory	Yoscovits, Z
34611: Physical Sciences, and Quant Reasoning II course.						
34613	discussion-recitation	D3V	05:00 PM - 06:50 PM	W	room 147 Loomis Laboratory	Mulcahy, B
34613: Physical Sciences, and Quant Reasoning II course.						
34616	discussion-recitation	D3X	05:00 PM - 06:50 PM	W	room 137 Loomis Laboratory	Mertens, D
34616: Physical Sciences, and Quant Reasoning II course.						
34619	discussion-recitation	D3Y	07:00 PM - 08:50 PM	W	room 147 Loomis Laboratory	Mertens, D
34619: Physical Sciences, and Quant Reasoning II course.						
34621	discussion-recitation	D4B	08:00 AM - 09:50 AM	R	room 147 Loomis Laboratory	Schwenk, D
34621: Physical Sciences, and Quant Reasoning II course.						
34622	discussion-recitation	D4C	08:00 AM - 09:50 AM	R	room 137 Loomis Laboratory	Mertens, D
34622: Physical Sciences, and Quant Reasoning II course.						
34624	discussion-recitation	D4G	10:00 AM - 11:50 AM	R	room 147 Loomis Laboratory	McArdle, T
34624: Physical Sciences, and Quant Reasoning II course.						
34625	discussion-recitation	D4H	10:00 AM - 11:50 AM	R	room 137 Loomis Laboratory	Schwenk, D
34625: Physical Sciences, and Quant Reasoning II course.						
34628	discussion-recitation	D4N	01:00 PM - 02:50 PM	R	room 147 Loomis Laboratory	Mulcahy, B
34628: Physical Sciences, and Quant Reasoning II course.						
47717	discussion-recitation	D4P	01:00 PM - 02:50 PM	R	room 137 Loomis Laboratory	Yoscovits, Z
47717: Physical Sciences, and Quant Reasoning II course.						
34630	discussion-recitation	D4S	03:00 PM - 04:50 PM	R	room 147 Loomis Laboratory	Mears, P
34630: Physical Sciences, and Quant Reasoning II course.						

34727	discussion-recitation	D4U	03:00 PM - 04:50 PM	R	room 137 Loomis Laboratory	Mulcahy, B
34727: Physical Sciences, and Quant Reasoning II course.						
34648	laboratory	L2B	08:00 AM - 09:50 AM	T	room 264 Loomis Laboratory	Neubauer, M
34648: Physical Sciences, and Quant Reasoning II course.						
34653	laboratory	L2G	10:00 AM - 11:50 AM	T	room 264 Loomis Laboratory	Quisno, A
34653: Physical Sciences, and Quant Reasoning II course.						
34657	laboratory	L2N	01:00 PM - 02:50 PM	T	room 264 Loomis Laboratory	Olson, G
34657: Physical Sciences, and Quant Reasoning II course.						
34659	laboratory	L2S	03:00 PM - 04:50 PM	T	room 264 Loomis Laboratory	Lui, T
34659: Physical Sciences, and Quant Reasoning II course.						
34661	laboratory	L2V	05:00 PM - 06:50 PM	T	room 264 Loomis Laboratory	Lo, K
34661: Physical Sciences, and Quant Reasoning II course.						
34663	laboratory	L2Y	07:00 PM - 08:50 PM	T	room 264 Loomis Laboratory	Olson, G
34663: Physical Sciences, and Quant Reasoning II course.						
47578	laboratory	L3B	08:00 AM - 09:50 AM	W	room 264 Loomis Laboratory	Zhang, S
47578: Physical Sciences, and Quant Reasoning II course.						
34665	laboratory	L3G	10:00 AM - 11:50 AM	W	room 264 Loomis Laboratory	Lui, T
34665: Physical Sciences, and Quant Reasoning II course.						
34667	laboratory	L3N	01:00 PM - 02:50 PM	W	room 264 Loomis Laboratory	Olson, G
34667: Physical Sciences, and Quant Reasoning II course.						
34670	laboratory	L3S	03:00 PM - 04:50 PM	W	room 264 Loomis Laboratory	Lo, K
34670: Physical Sciences, and Quant Reasoning II course.						
34673	laboratory	L3V	05:00 PM - 06:50 PM	W	room 264 Loomis Laboratory	Evans, W

34673: Physical Sciences, and Quant Reasoning II course.						
34684	laboratory	L3Y	07:00 PM - 08:50 PM	W	room 264 Loomis Laboratory	Evans, W
34684: Physical Sciences, and Quant Reasoning II course.						
34689	laboratory	L4B	08:00 AM - 09:50 AM	R	room 264 Loomis Laboratory	Quisno, A
34689: Physical Sciences, and Quant Reasoning II course.						
34693	laboratory	L4G	10:00 AM - 11:50 AM	R	room 264 Loomis Laboratory	Quisno, A
34693: Physical Sciences, and Quant Reasoning II course.						
34698	laboratory	L4N	01:00 PM - 02:50 PM	R	room 264 Loomis Laboratory	Quisno, A
34698: Physical Sciences, and Quant Reasoning II course.						
34700	laboratory	L4S	03:00 PM - 04:50 PM	R	room 264 Loomis Laboratory	Zielnicki, K
34700: Physical Sciences, and Quant Reasoning II course.						
34703	laboratory	L4V	05:00 PM - 06:50 PM	R	room 264 Loomis Laboratory	Zielnicki, K
34703: Physical Sciences, and Quant Reasoning II course.						
34730	laboratory	L4Y	07:00 PM - 08:50 PM	R	room 264 Loomis Laboratory	Evans, W
34730: Physical Sciences, and Quant Reasoning II course.						
34706	laboratory	L5B	08:00 AM - 09:50 AM	F	room 264 Loomis Laboratory	Zhang, S
34706: Physical Sciences, and Quant Reasoning II course.						
34709	laboratory	L5G	10:00 AM - 11:50 AM	F	room 264 Loomis Laboratory	Zhang, S
34709: Physical Sciences, and Quant Reasoning II course.						
34724	laboratory	L5N	01:00 PM - 02:50 PM	F	room 264 Loomis Laboratory	Lo, K
34724: Physical Sciences, and Quant Reasoning II course.						

212 **Univ Physics, Elec & Mag** credit: 4 hours.

Coulomb's Law, electric fields, Gauss' Law, electric potential, capacitance, circuits, magnetic forces and fields, Ampere's law, induction, electromagnetic waves, polarization, and geometrical optics. Lectures with demonstrations, discussions, and laboratory. For students in engineering, mathematics, physics, and

chemistry. Credit is not given for both PHYS 212 and PHYS 102. Prerequisite: PHYS 211; credit or concurrent registration in MATH 241 (formerly MATH 243) or MATH 242.

This course satisfies the General Education Criteria for a Physical Sciences, and Quant Reasoning II course.

For students in engineering, mathematics, physics and chemistry. Exams are given in the evening (during fall and spring semesters). Register for a lecture (A) section, a discussion (D) section and a laboratory (L) section. Engineering students must obtain a dean's approval to drop this course after the second week of instruction.

CRN	Type	Section	Time	Days	Location	Instructor
34734	lecture	A1	08:30 AM - 09:45 AM	TR	room 151 Loomis Laboratory	Kwiat, P
34734: Physical Sciences, and Quant Reasoning II course.						
34736	lecture	A2	10:00 AM - 11:15 AM	TR	room 151 Loomis Laboratory	Kwiat, P
34736: Physical Sciences, and Quant Reasoning II course.						
34745	lecture	A3	01:00 PM - 02:15 PM	TR	room 151 Loomis Laboratory	Mason, N
34745: Physical Sciences, and Quant Reasoning II course.						
43044	lecture	A4	02:30 PM - 03:45 PM	TR	room 151 Loomis Laboratory	Mason, N
43044: Physical Sciences, and Quant Reasoning II course.						
34749	discussion-recitation	D2G	10:00 AM - 11:50 AM	T	room 139 Loomis Laboratory	Wiss, J
34749: Physical Sciences, and Quant Reasoning II course.						
34752	discussion-recitation	D2N	01:00 PM - 02:50 PM	T	room 139 Loomis Laboratory	Hanna, A
34752: Physical Sciences, and Quant Reasoning II course.						
45665	discussion-recitation	D2P	01:00 PM - 02:50 PM	T	room 143 Loomis Laboratory	Gan, Y
45665: Physical Sciences, and Quant Reasoning II course.						
34758	discussion-recitation	D2S	03:00 PM - 04:50 PM	T	room 139 Loomis Laboratory	Hanna, A
34758: Physical Sciences, and Quant Reasoning II course.						
34760	discussion-recitation	D2U	03:00 PM - 04:50 PM	T	room 143 Loomis Laboratory	Sharma, A
34760: Physical Sciences, and Quant Reasoning II course.						

34768	discussion-recitation	D2V	05:00 PM - 06:50 PM	T	room 139 Loomis Laboratory	Murray, M
34768: Physical Sciences, and Quant Reasoning II course.						
34770	discussion-recitation	D2X	05:00 PM - 06:50 PM	T	room 143 Loomis Laboratory	Vandervelde, D
34770: Physical Sciences, and Quant Reasoning II course.						
34773	discussion-recitation	D2Y	07:00 PM - 08:50 PM	T	room 139 Loomis Laboratory	Murray, M
34773: Physical Sciences, and Quant Reasoning II course.						
34779	discussion-recitation	D3B	08:00 AM - 09:50 AM	W	room 139 Loomis Laboratory	Gezo, J
34779: Physical Sciences, and Quant Reasoning II course.						
34757	discussion-recitation	D3C	08:00 AM - 09:50 AM	W	room 143 Loomis Laboratory	Lin, Y
34757: Physical Sciences, and Quant Reasoning II course.						
34783	discussion-recitation	D3G	10:00 AM - 11:50 AM	W	room 139 Loomis Laboratory	Lin, Y
34783: Physical Sciences, and Quant Reasoning II course.						
34787	discussion-recitation	D3H	10:00 AM - 11:50 AM	W	room 143 Loomis Laboratory	Roberts, K
34787: Physical Sciences, and Quant Reasoning II course.						
34790	discussion-recitation	D3N	01:00 PM - 02:50 PM	W	room 139 Loomis Laboratory	Murray, M
34790: Physical Sciences, and Quant Reasoning II course.						
34793	discussion-recitation	D3P	01:00 PM - 02:50 PM	W	room 143 Loomis Laboratory	De Gottardi, W
34793: Physical Sciences, and Quant Reasoning II course.						
34796	discussion-recitation	D3S	03:00 PM - 04:50 PM	W	room 139 Loomis Laboratory	De Gottardi, W
34796: Physical Sciences, and Quant Reasoning II course.						
34800	discussion-recitation	D3U	03:00 PM - 04:50 PM	W	room 143 Loomis Laboratory	Sharma, A
34800: Physical Sciences, and Quant Reasoning II course.						
34834	discussion-recitation	D4G	10:00 AM - 11:50 AM	R	room 139 Loomis Laboratory	Roberts, K

34834: Physical Sciences, and Quant Reasoning II course.						
34838	discussion-recitation	D4N	01:00 PM - 02:50 PM	R	room 139 Loomis Laboratory	Fleck, P
34838: Physical Sciences, and Quant Reasoning II course.						
34846	discussion-recitation	D4S	03:00 PM - 04:50 PM	R	room 139 Loomis Laboratory	Fleck, P
34846: Physical Sciences, and Quant Reasoning II course.						
34849	discussion-recitation	D4U	03:00 PM - 04:50 PM	R	room 143 Loomis Laboratory	Sharma, A
34849: Physical Sciences, and Quant Reasoning II course.						
34853	discussion-recitation	D4V	05:00 PM - 06:50 PM	R	room 139 Loomis Laboratory	Gan, Y
34853: Physical Sciences, and Quant Reasoning II course.						
48007	discussion-recitation	D4W	05:00 PM - 06:50 PM	R	room 147 Loomis Laboratory	Tsekenis, G
48007: Physical Sciences, and Quant Reasoning II course.						
34857	discussion-recitation	D4X	05:00 PM - 06:50 PM	R	room 143 Loomis Laboratory	Vandervelde, D
34857: Physical Sciences, and Quant Reasoning II course.						
34861	discussion-recitation	D4Y	07:00 PM - 08:50 PM	R	room 139 Loomis Laboratory	Vandervelde, D
34861: Physical Sciences, and Quant Reasoning II course.						
34842	discussion-recitation	D4Z	07:00 PM - 08:50 PM	R	room 143 Loomis Laboratory	Tsekenis, G
34842: Physical Sciences, and Quant Reasoning II course.						
34864	discussion-recitation	D5B	08:00 AM - 09:50 AM	F	room 139 Loomis Laboratory	Gezo, J
34864: Physical Sciences, and Quant Reasoning II course.						
34474	discussion-recitation	D5C	08:00 AM - 09:50 AM	F	room 143 Loomis Laboratory	Lin, Y
34474: Physical Sciences, and Quant Reasoning II course.						
34523	discussion-recitation	D5G	10:00 AM - 11:50 AM	F	room 139 Loomis Laboratory	Gezo, J
34523: Physical Sciences, and Quant Reasoning II course.						

34525	discussion-recitation	D5H	10:00 AM - 11:50 AM	F	room 143 Loomis Laboratory	Roberts, K
34525: Physical Sciences, and Quant Reasoning II course.						
48027	discussion-recitation	D5J	10:00 AM - 11:50 AM	F	room 147 Loomis Laboratory	De Gottardi, W
48027: Physical Sciences, and Quant Reasoning II course.						
34528	discussion-recitation	D5N	01:00 PM - 02:50 PM	F	room 139 Loomis Laboratory	Hanna, A
34528: Physical Sciences, and Quant Reasoning II course.						
34534	discussion-recitation	D5P	01:00 PM - 02:50 PM	F	room 143 Loomis Laboratory	Tsekenis, G
34534: Physical Sciences, and Quant Reasoning II course.						
34537	discussion-recitation	D5S	03:00 PM - 04:50 PM	F	room 139 Loomis Laboratory	Fleck, P
34537: Physical Sciences, and Quant Reasoning II course.						
34540	discussion-recitation	D5U	03:00 PM - 04:50 PM	F	room 143 Loomis Laboratory	Gan, Y
34540: Physical Sciences, and Quant Reasoning II course.						
34542	laboratory	L1G	10:00 AM - 11:50 AM	M	room 262 Loomis Laboratory	Giannetta, R
34542: Physical Sciences, and Quant Reasoning II course.						
34576	laboratory	L1H	10:00 AM - 11:50 AM	M	room 234 Loomis Laboratory	Coggeshall, J
34576: Physical Sciences, and Quant Reasoning II course.						
34577	laboratory	L1N	01:00 PM - 02:50 PM	M	room 262 Loomis Laboratory	Strand, J
34577: Physical Sciences, and Quant Reasoning II course.						
34579	laboratory	L1P	01:00 PM - 02:50 PM	M	room 234 Loomis Laboratory	Coggeshall, J
34579: Physical Sciences, and Quant Reasoning II course.						
34583	laboratory	L1S	03:00 PM - 04:50 PM	M	room 262 Loomis Laboratory	Chakraborty, S
34583: Physical Sciences, and Quant Reasoning II course.						
34581	laboratory	L1U	03:00 PM - 04:50 PM	M	room 234 Loomis Laboratory	Sekwao, S

34581: Physical Sciences, and Quant Reasoning II course.						
34584	laboratory	L1V	05:00 PM - 06:50 PM	M	room 262 Loomis Laboratory	Chakraborty, S
34584: Physical Sciences, and Quant Reasoning II course.						
34587	laboratory	L1X	05:00 PM - 06:50 PM	M	room 234 Loomis Laboratory	Sekwao, S
34587: Physical Sciences, and Quant Reasoning II course.						
34589	laboratory	L1Y	07:00 PM - 08:50 PM	M	room 262 Loomis Laboratory	Chakraborty, S
34589: Physical Sciences, and Quant Reasoning II course.						
34641	laboratory	L1Z	07:00 PM - 08:50 PM	M	room 234 Loomis Laboratory	Sekwao, S
34641: Physical Sciences, and Quant Reasoning II course.						
34591	laboratory	L2G	10:00 AM - 11:50 AM	T	room 262 Loomis Laboratory	Lie, K
34591: Physical Sciences, and Quant Reasoning II course.						
34593	laboratory	L2H	10:00 AM - 11:50 AM	T	room 234 Loomis Laboratory	Jones, A
34593: Physical Sciences, and Quant Reasoning II course.						
34596	laboratory	L2N	01:00 PM - 02:50 PM	T	room 262 Loomis Laboratory	Sivil, D
34596: Physical Sciences, and Quant Reasoning II course.						
34600	laboratory	L2S	03:00 PM - 04:50 PM	T	room 262 Loomis Laboratory	Sahu, M
34600: Physical Sciences, and Quant Reasoning II course.						
34603	laboratory	L2U	03:00 PM - 04:50 PM	T	room 234 Loomis Laboratory	Atkinson Mora, J
34603: Physical Sciences, and Quant Reasoning II course.						
34606	laboratory	L2V	05:00 PM - 06:50 PM	T	room 262 Loomis Laboratory	Jones, A
34606: Physical Sciences, and Quant Reasoning II course.						
34609	laboratory	L2X	05:00 PM - 06:50 PM	T	room 234 Loomis Laboratory	Zhang, L
34609: Physical Sciences, and Quant Reasoning II course.						

34612	laboratory	L2Y	07:00 PM - 08:50 PM	T	room 262 Loomis Laboratory	Sahu, M
34612: Physical Sciences, and Quant Reasoning II course.						
34599	laboratory	L2Z	07:00 PM - 08:50 PM	T	room 234 Loomis Laboratory	Zhang, L
34599: Physical Sciences, and Quant Reasoning II course.						
34615	laboratory	L3B	08:00 AM - 09:50 AM	W	room 262 Loomis Laboratory	Powell, P
34615: Physical Sciences, and Quant Reasoning II course.						
45661	laboratory	L3C	08:00 AM - 09:50 AM	W	room 234 Loomis Laboratory	Lie, K
45661: Physical Sciences, and Quant Reasoning II course.						
34618	laboratory	L3G	10:00 AM - 11:50 AM	W	room 262 Loomis Laboratory	Powell, P
34618: Physical Sciences, and Quant Reasoning II course.						
34631	laboratory	L3H	10:00 AM - 11:50 AM	W	room 234 Loomis Laboratory	Jones, A
34631: Physical Sciences, and Quant Reasoning II course.						
34632	laboratory	L3N	01:00 PM - 02:50 PM	W	room 262 Loomis Laboratory	Strand, J
34632: Physical Sciences, and Quant Reasoning II course.						
34633	laboratory	L3P	01:00 PM - 02:50 PM	W	room 234 Loomis Laboratory	Coggeshall, J
34633: Physical Sciences, and Quant Reasoning II course.						
34634	laboratory	L3S	03:00 PM - 04:50 PM	W	room 262 Loomis Laboratory	Powell, P
34634: Physical Sciences, and Quant Reasoning II course.						
34635	laboratory	L3U	03:00 PM - 04:50 PM	W	room 234 Loomis Laboratory	Sahu, M
34635: Physical Sciences, and Quant Reasoning II course.						
48008	laboratory	L3V	05:00 PM - 06:50 PM	W	room 262 Loomis Laboratory	Atkinson Mora, J
48008: Physical Sciences, and Quant Reasoning II course.						
48231	laboratory	L3X	05:00 PM - 06:50 PM	W	room 234 Loomis Laboratory	Sivil, D

48231: Physical Sciences, and Quant Reasoning II course.						
48026	laboratory	L3Y	07:00 PM - 08:50 PM	W	room 262 Loomis Laboratory	Atkinson Mora, J
48026: Physical Sciences, and Quant Reasoning II course.						
34636	laboratory	L4B	08:00 AM - 09:50 AM	R	room 262 Loomis Laboratory	Zhang, L
34636: Physical Sciences, and Quant Reasoning II course.						
34637	laboratory	L4G	10:00 AM - 11:50 AM	R	room 262 Loomis Laboratory	Lie, K
34637: Physical Sciences, and Quant Reasoning II course.						
34640	laboratory	L4H	10:00 AM - 11:50 AM	R	room 234 Loomis Laboratory	Strand, J
34640: Physical Sciences, and Quant Reasoning II course.						
34638	laboratory	L4N	01:00 PM - 02:50 PM	R	room 262 Loomis Laboratory	Sivil, D
34638: Physical Sciences, and Quant Reasoning II course.						

**213 Univ Physics, Thermal Physics** credit: 2 hours.

An introduction to the first and second laws of thermodynamics including kinetic theory of gases, heat capacity, heat engines, introduction to entropy and statistical mechanics, and introduction to application of free energy and Boltzmann factor. Lectures with demonstrations, discussions, and laboratory. For students in engineering, mathematics, physics and chemistry. Credit is not given for both PHYS 213 and PHYS 101. Prerequisite: PHYS 211; credit or concurrent registration in MATH 241 (formerly MATH 243) or MATH 242.

This course satisfies the General Education Criteria for a Physical Sciences, and Quant Reasoning II course.

For students in engineering, mathematics, physics and chemistry. Exams are given in the evening (during fall and spring semesters). PHYS 213 meets only during part of the term; check the meeting dates. Register for a lecture (A) section, a discussion (D) section and a laboratory (L) section. Engineering students must obtain a dean's approval to drop this course after the second week of instruction.

CRN	Type	Section	Time	Days	Location	Instructor
34643	lecture	A1	08:30 AM - 09:45 AM	TR	room 141 Loomis Laboratory	Weissman, M
34643: Physical Sciences, and Quant Reasoning II course. Meets 15-Oct-07 - 07-Dec-07.						
34645	lecture	A2	10:00 AM - 11:15 AM	TR	room 141 Loomis Laboratory	Weissman, M
34645: Physical Sciences, and Quant Reasoning II course. Meets 15-Oct-07 - 07-Dec-07.						
38561	discussion-recitation	D2G	10:00 AM - 11:50 AM	T	room 242 Loomis Laboratory	Martin, R

38561: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38562	discussion-recitation	D2N	01:00 PM - 02:50 PM	T	room 242 Loomis Laboratory	Wotherspoon, T
38562: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38563	discussion-recitation	D2S	03:00 PM - 04:50 PM	T	room 242 Loomis Laboratory	Wotherspoon, T
38563: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38565	discussion-recitation	D2V	05:00 PM - 06:50 PM	T	room 236 Loomis Laboratory	Ferguson, D
38565: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38564	discussion-recitation	D2X	05:00 PM - 06:50 PM	T	room 242 Loomis Laboratory	Brenner, M
38564: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38566	discussion-recitation	D2Y	07:00 PM - 08:50 PM	T	room 242 Loomis Laboratory	Ferguson, D
38566: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38567	discussion-recitation	D3B	08:00 AM - 09:50 AM	W	room 242 Loomis Laboratory	Law, S
38567: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38572	discussion-recitation	D3G	10:00 AM - 11:50 AM	W	room 242 Loomis Laboratory	Ferguson, D
38572: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38569	discussion-recitation	D3N	01:00 PM - 02:50 PM	W	room 242 Loomis Laboratory	Law, S
38569: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38577	discussion-recitation	D3S	03:00 PM - 04:50 PM	W	room 242 Loomis Laboratory	Brenner, M
38577: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38574	discussion-recitation	D3X	05:00 PM - 06:50 PM	W	room 242 Loomis Laboratory	Brenner, M
38574: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38585	discussion-recitation	D4G	10:00 AM - 11:50 AM	R	room 242 Loomis Laboratory	Tan, M
38585: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						

38578	discussion-recitation	D4N	01:00 PM - 02:50 PM	R	room 242 Loomis Laboratory	Tan, M
38578: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38587	discussion-recitation	D4S	03:00 PM - 04:50 PM	R	room 242 Loomis Laboratory	Wotherspoon, T
38587: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38588	discussion-recitation	D4X	05:00 PM - 06:50 PM	R	room 242 Loomis Laboratory	Wotherspoon, T
38588: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38594	discussion-recitation	D5B	08:00 AM - 09:50 AM	F	room 242 Loomis Laboratory	Tan, M
38594: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38596	discussion-recitation	D5G	10:00 AM - 11:50 AM	F	room 242 Loomis Laboratory	Tan, M
38596: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38598	discussion-recitation	D5N	01:00 PM - 02:50 PM	F	room 242 Loomis Laboratory	Wang, X
38598: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38599	discussion-recitation	D5S	03:00 PM - 04:50 PM	F	room 242 Loomis Laboratory	Wang, X
38599: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38559	discussion-recitation	D5U	03:00 PM - 04:50 PM	F	room 236 Loomis Laboratory	Brenner, M
38559: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38532	laboratory	L2G	10:00 AM - 11:50 AM	T	room 164 Loomis Laboratory	Chiang, T
38532: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38533	laboratory	L2N	01:00 PM - 02:50 PM	T	room 164 Loomis Laboratory	Carls, B
38533: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38535	laboratory	L2S	03:00 PM - 04:50 PM	T	room 164 Loomis Laboratory	Missel, A
38535: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38537	laboratory	L2X	05:00 PM - 06:50 PM	T	room 164 Loomis Laboratory	Missel, A

38537: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38539	laboratory	L2Y	07:00 PM - 08:50 PM	T	room 164 Loomis Laboratory	Missel, A
38539: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38518	laboratory	L3B	08:00 AM - 09:50 AM	W	room 164 Loomis Laboratory	Carls, B
38518: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38542	laboratory	L3G	10:00 AM - 11:50 AM	W	room 164 Loomis Laboratory	Vissers, M
38542: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38544	laboratory	L3N	01:00 PM - 02:50 PM	W	room 164 Loomis Laboratory	Carls, B
38544: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38546	laboratory	L3S	03:00 PM - 04:50 PM	W	room 164 Loomis Laboratory	Knapp, A
38546: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38548	laboratory	L3X	05:00 PM - 06:50 PM	W	room 164 Loomis Laboratory	Roy, A
38548: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38526	laboratory	L3Y	07:00 PM - 08:50 PM	W	room 164 Loomis Laboratory	Roy, A
38526: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38551	laboratory	L4G	10:00 AM - 11:50 AM	R	room 164 Loomis Laboratory	Shen, K
38551: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38553	laboratory	L4N	01:00 PM - 02:50 PM	R	room 164 Loomis Laboratory	Knapp, A
38553: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38555	laboratory	L4S	03:00 PM - 04:50 PM	R	room 164 Loomis Laboratory	Knapp, A
38555: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38556	laboratory	L4X	05:00 PM - 06:50 PM	R	room 164 Loomis Laboratory	Hoang, T
38556: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						

38557	laboratory	L4Y	07:00 PM - 08:50 PM	R	room 164 Loomis Laboratory	Hoang, T
38557: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38558	laboratory	L5B	08:00 AM - 09:50 AM	F	room 164 Loomis Laboratory	Vissers, M
38558: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38520	laboratory	L5G	10:00 AM - 11:50 AM	F	room 164 Loomis Laboratory	Shen, K
38520: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38511	laboratory	L5J	12:00 PM - 01:50 PM	F	room 164 Loomis Laboratory	Roy, A
38511: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						
38530	laboratory	L5P	02:00 PM - 03:50 PM	F	room 164 Loomis Laboratory	Shen, K
38530: Physical Sciences, and Quant Reasoning II course.Meets 15-Oct-07 - 07-Dec-07.						

214 **Univ Physics, Quantum Phys** credit: 2 hours.

Interference and diffraction, photons and matter waves, the Bohr atom, uncertainty principle, and wave mechanics. Lectures with demonstrations, discussions, and laboratory. For students in engineering, mathematics, physics, and chemistry. Credit is not given for both PHYS 214 and PHYS 102. Prerequisite: PHYS 212 (includes MATH 241 (formerly MATH 243) or MATH 242; PHYS 211).

This course satisfies the General Education Criteria for a Physical Sciences, and Quant Reasoning II course.

For students in engineering, mathematics, physics and chemistry. Exams are given in the evening (during fall and spring semesters). PHYS 214 meets only during part of the term; check the meeting dates. Register for a lecture (A) section, a discussion (D) section and a laboratory (L) section. Engineering students must obtain a dean's approval to drop this course after the second week of instruction.

CRN	Type	Section	Time	Days	Location	Instructor
34891	lecture	A1	08:30 AM - 09:45 AM	TR	room 141 Loomis Laboratory	Martin, R
34891: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
34894	lecture	A2	10:00 AM - 11:15 AM	TR	room 141 Loomis Laboratory	Martin, R
34894: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38579	discussion-recitation	D2G	10:00 AM - 11:50 AM	T	room 242 Loomis Laboratory	Weissman, M
38579: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						

38575	discussion-recitation	D2N	01:00 PM - 02:50 PM	T	room 242 Loomis Laboratory	Wotherspoon, T
38575: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38582	discussion-recitation	D2S	03:00 PM - 04:50 PM	T	room 242 Loomis Laboratory	Wotherspoon, T
38582: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38605	discussion-recitation	D2V	05:00 PM - 06:50 PM	T	room 236 Loomis Laboratory	Ferguson, D
38605: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38604	discussion-recitation	D2X	05:00 PM - 06:50 PM	T	room 242 Loomis Laboratory	Brenner, M
38604: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38584	discussion-recitation	D2Y	07:00 PM - 08:50 PM	T	room 242 Loomis Laboratory	Ferguson, D
38584: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38603	discussion-recitation	D3B	08:00 AM - 09:50 AM	W	room 242 Loomis Laboratory	Law, S
38603: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38581	discussion-recitation	D3G	10:00 AM - 11:50 AM	W	room 242 Loomis Laboratory	Ferguson, D
38581: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38601	discussion-recitation	D3N	01:00 PM - 02:50 PM	W	room 242 Loomis Laboratory	Law, S
38601: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38600	discussion-recitation	D3S	03:00 PM - 04:50 PM	W	room 242 Loomis Laboratory	Brenner, M
38600: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38597	discussion-recitation	D3X	05:00 PM - 06:50 PM	W	room 242 Loomis Laboratory	Brenner, M
38597: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38593	discussion-recitation	D4G	10:00 AM - 11:50 AM	R	room 242 Loomis Laboratory	Tan, M
38593: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38591	discussion-recitation	D4N	01:00 PM - 02:50 PM	R	room 242 Loomis Laboratory	Tan, M

38591: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38589	discussion-recitation	D4S	03:00 PM - 04:50 PM	R	room 242 Loomis Laboratory	Wotherspoon, T
38589: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38586	discussion-recitation	D4X	05:00 PM - 06:50 PM	R	room 242 Loomis Laboratory	Wotherspoon, T
38586: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38606	discussion-recitation	D5B	08:00 AM - 09:50 AM	F	room 242 Loomis Laboratory	Tan, M
38606: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38570	discussion-recitation	D5G	10:00 AM - 11:50 AM	F	room 242 Loomis Laboratory	Tan, M
38570: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38576	discussion-recitation	D5N	01:00 PM - 02:50 PM	F	room 242 Loomis Laboratory	Wang, X
38576: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38571	discussion-recitation	D5S	03:00 PM - 04:50 PM	F	room 242 Loomis Laboratory	Wang, X
38571: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38568	discussion-recitation	D5U	03:00 PM - 04:50 PM	F	room 236 Loomis Laboratory	Brenner, M
38568: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38519	laboratory	L2G	10:00 AM - 11:50 AM	T	room 164 Loomis Laboratory	Chiang, T
38519: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38521	laboratory	L2N	01:00 PM - 02:50 PM	T	room 164 Loomis Laboratory	Carls, B
38521: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38523	laboratory	L2S	03:00 PM - 04:50 PM	T	room 164 Loomis Laboratory	Missel, A
38523: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38524	laboratory	L2X	05:00 PM - 06:50 PM	T	room 164 Loomis Laboratory	Missel, A
38524: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						

38525	laboratory	L2Y	07:00 PM - 08:50 PM	T	room 164 Loomis Laboratory	Missel, A
38525: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38513	laboratory	L3B	08:00 AM - 09:50 AM	W	room 164 Loomis Laboratory	Carls, B
38513: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38529	laboratory	L3G	10:00 AM - 11:50 AM	W	room 164 Loomis Laboratory	Vissers, M
38529: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38531	laboratory	L3N	01:00 PM - 02:50 PM	W	room 164 Loomis Laboratory	Carls, B
38531: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38534	laboratory	L3S	03:00 PM - 04:50 PM	W	room 164 Loomis Laboratory	Knapp, A
38534: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38536	laboratory	L3X	05:00 PM - 06:50 PM	W	room 164 Loomis Laboratory	Roy, A
38536: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38515	laboratory	L3Y	07:00 PM - 08:50 PM	W	room 164 Loomis Laboratory	Roy, A
38515: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38541	laboratory	L4G	10:00 AM - 11:50 AM	R	room 164 Loomis Laboratory	Shen, K
38541: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38543	laboratory	L4N	01:00 PM - 02:50 PM	R	room 164 Loomis Laboratory	Knapp, A
38543: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38545	laboratory	L4S	03:00 PM - 04:50 PM	R	room 164 Loomis Laboratory	Knapp, A
38545: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38547	laboratory	L4X	05:00 PM - 06:50 PM	R	room 164 Loomis Laboratory	Hoang, T
38547: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38550	laboratory	L4Y	07:00 PM - 08:50 PM	R	room 164 Loomis Laboratory	Hoang, T

38550: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38552	laboratory	L5B	08:00 AM - 09:50 AM	F	room 164 Loomis Laboratory	Visser, M
38552: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38554	laboratory	L5G	10:00 AM - 11:50 AM	F	room 164 Loomis Laboratory	Shen, K
38554: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38512	laboratory	L5J	12:00 PM - 01:50 PM	F	room 164 Loomis Laboratory	Roy, A
38512: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						
38517	laboratory	L5P	02:00 PM - 03:50 PM	F	room 164 Loomis Laboratory	Shen, K
38517: Physical Sciences, and Quant Reasoning II course.Meets 22-Aug-07 - 12-Oct-07.						

325 ***Mechanics and Relativity I*** credit: 3 hours.

Examines kinematics and dynamics. Vector analysis will be developed as needed. Topics include special relativity, Newtonian kinematics and dynamics in three dimensions, behavior of systems of particles, oscillations, transient response of oscillators, nonlinear oscillators, motion in rotating frames of reference, and rigid body dynamics. Credit not given for both PHYS 325 and PHYS 219. Prerequisite: Credit or concurrent registration in PHYS 212 and MATH 385.

Register for the lecture and for one of the discussion sections.

CRN	Type	Section	Time	Days	Location	Instructor
32694	lecture	A	08:30 AM - 09:50 AM	MW	room 144 Loomis Laboratory	Lamb, S
32687	discussion-recitation	D1	06:00 PM - 06:50 PM	M	room 236 Loomis Laboratory	Mantey, K; Siman, W
32688	discussion-recitation	D2	07:00 PM - 07:50 PM	M	room 236 Loomis Laboratory	Mantey, K; Siman, W
32691	discussion-recitation	D3	08:00 PM - 08:50 PM	M	room 236 Loomis Laboratory	Mantey, K; Siman, W

326 ***Mechanics and Relativity II*** credit: 3 hours.

Continuation of PHYS 325. Topics include Lagrangian techniques and the calculus of variations, central force motion, scattering, coupled oscillations, the wave equation in one dimension, generalized coordinates and the Hamiltonian formulation, relativistic dynamics, Euler angles and tops, non-linear and fluid dynamics. Prerequisite: PHYS 325; credit or concurrent registration in MATH 241 (formerly MATH 243) or MATH 380.

Register for the lecture and one of the discussion sections.

CRN	Type	Section	Time	Days	Location	Instructor
32751	lecture	A	01:00 PM - 02:20 PM	MW	room 158 Loomis Laboratory	Eckstein, J
32737	discussion-recitation	D1	06:00 PM - 06:50 PM	M	room 242 Loomis Laboratory	Zheng, M
32741	discussion-recitation	D2	07:00 PM - 07:50 PM	M	room 242 Loomis Laboratory	Zheng, M
32749	discussion-recitation	D3	08:00 PM - 08:50 PM	M	room 242 Loomis Laboratory	Zheng, M

401 **Classical Physics Lab** credit: 3 hours.

Experiments and techniques in Classical Mechanics and Electromagnetism. Dynamics of electrical and mechanical oscillators in the linear domain. Fourier analysis of system response. Measurements of electrostatic fields, transmission lines, waves, and radiation. Investigation of electromagnetic phenomena in dielectrics, conductors, and magnetic materials. Instruction in data analysis and report writing. Graduate credit is not given to physics graduate program majors. Prerequisite: PHYS 325.

Register for the lecture and one of the laboratory sections.

CRN	Type	Section	Time	Days	Location	Instructor
32710	lecture	A	03:30 PM - 04:20 PM	M	room 136 Loomis Laboratory	Budakian, R
32704	laboratory	L1	01:00 PM - 04:50 PM	T	room 6103 Engineering Sciences Bldg	Stehno, M
32707	laboratory	L2	01:00 PM - 04:50 PM	W	room 6103 Engineering Sciences Bldg	Bahr, D
32708	laboratory	L3	08:00 AM - 11:50 AM	R	room 6103 Engineering Sciences Bldg	Nichol, J

402 **Light** credit: 0 to 4 hours.

Wave kinematics; geometrical optics: basic concepts, ray-tracing and matrix formalism, Gaussian imaging by thick lenses, stops, apertures, and intensity relations; interference; interference spectroscopy and coherence; diffraction: Fresnel-Kirchhoff formulation, Fraunhofer case, Fresnel case, and holography; polarized light. Lectures, laboratory, and problems. 4 undergraduate hours. 3 or 4 graduate hours (3 hours without lab). Prerequisite: PHYS 102 (includes PHYS 101) or PHYS 214 (includes PHYS 211 and PHYS 212); MATH 385.

CRN	Type	Section	Time	Days	Location	Instructor
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33052	lecture	AA	11:00 AM - 12:20 PM	MW	room 136 Loomis Laboratory	Debevec, P
33052: 3 hours Graduate students (only) may enroll in the AA lecture (and no laboratory) for 3 hours credit.						
47625	lecture	BB	11:00 AM - 12:20 PM	MW	room 136 Loomis Laboratory	Debevec, P
47625: 4 hours Undergraduate and graduate students may enroll in the BB lecture and in one of the laboratory (BL) sections for 4 hours credit.						
32781	laboratory	BL1	09:00 AM - 11:50 AM	T	room 6106 Engineering Sciences Bldg	Rajaram, S
32782	laboratory	BL2	02:00 PM - 04:50 PM	W	room 6106 Engineering Sciences Bldg	Rajaram, S

403 **Modern Experimental Physics** credit: 2 to 5 hours.

Techniques and experiments in the physics of atoms, atomic nuclei, molecules, the solid state, and other areas of modern physical research. 3 to 5 undergraduate hours, or 2 to 4 graduate hours. First time registration must be for 5 undergraduate hours or 4 graduate hours. May be repeated for variable credit of 3 to 5 undergraduate hours or 2 to 4 graduate hours. Prerequisite: PHYS 401; concurrent registration in PHYS 486.

CRN	Type	Section	Time	Days	Location	Instructor
30674	laboratory	A	01:00 PM - 04:50 PM	TR	room 5105 Engineering Sciences Bldg	Hertzog, D; Colla, E

419 **Space, Time, and Matter-ACP** credit: 3 or 4 hours.

Course is identical to PHYS 420 except for the additional writing component including a final term paper. Same as PHIL 419. 3 undergraduate hours. 4 graduate hours. Credit is not given for both PHYS 419 and PHYS 420. Junior standing is required. Prerequisite: One physical science course; one of PHYS 214, PHIL 101, PHIL 270, PHIL 317.

This course satisfies the General Education Criteria for a Advanced Composition course.

CRN	Type	Section	Time	Days	Location	Instructor
34926	lecture	A	02:30 PM - 03:50 PM	TR	room 144 Loomis Laboratory	Leggett, A
34926: Advanced Composition course.						
34926: 3 hours Undergraduates enroll in section A (34926). (To enroll in this course without the Advanced Composition component and for reduced credit, see PHYS 420.)						
41220	lecture	G	02:30 PM - 03:50 PM	TR	room 144 Loomis Laboratory	Leggett, A

41220: Advanced Composition course.

41220: 4 hours Graduate students enroll in section G (41220).

420 **Space, Time, and Matter** credit: 2 hours.

Philosophical examination of some fundamental concepts and theories of the physical world, such as time, matter, space, and geometry; interpretation of quantum theory. Graduate students write an additional paper. Same as PHIL 420. Approved for both letter and S/U grading. Credit is not given for both PHYS 420 and PHYS 419. Junior standing is required. Prerequisite: One physical science course; one of PHYS 214, PHIL 101, PHIL 270, PHIL 317.

CRN	Type	Section	Time	Days	Location	Instructor
45795	lecture	NAC	02:30 PM - 03:50 PM	TR	room 144 Loomis Laboratory	Leggett, A

45795: Meets with and is the same as PHYS 419 except for carrying only 2 hours credit, requiring no final term paper and not satisfying the Advanced Composition requirement. Do not register for both 419 and 420.

427 **Thermo & Statistical Physics** credit: 4 hours.

Course in statistical and thermal physics designed primarily for advanced undergraduates; topics include equilibrium thermodynamics, statistical mechanics, and kinetic theory of gases. A unified treatment is used in that the principles of heat and thermodynamics are discussed along with statistical postulates and the microscopic approach of introductory quantum mechanics. Credit is not given for both PHYS 427 and any of ME 404, CHEM 442, CHEM 444, MSE 500. Prerequisite: Two 400-level courses in physics.

CRN	Type	Section	Time	Days	Location	Instructor
30681	lecture	A	08:30 AM - 09:50 AM	MW	room 136 Loomis Laboratory	Flynn, C

435 **Electromagnetic Fields I** credit: 3 hours.

Concerns static electric and magnetic fields, their interactions with electric charge and current, and their transformation properties; the effect of special relativity is incorporated. Macroscopic fields in material media are described. Prerequisite: PHYS 325; MATH 385; credit or concurrent registration in MATH 241 (formerly MATH 243) or MATH 380.

Register for the lecture and one of the discussion sections.

CRN	Type	Section	Time	Days	Location	Instructor
32763	lecture	A	10:00 AM - 10:50 AM	MWF	room 136 Loomis Laboratory	Errede, S
32757	discussion-recitation	D1	07:00 PM - 07:50 PM	W	room 139 Loomis Laboratory	Singleton, M

32760	discussion-recitation	D2	08:00 PM - 08:50 PM	W	room 139 Loomis Laboratory	Singleton, M
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436 **Electromagnetic Fields II** credit: 3 hours.

Concentrates on time-dependent fields. Electromagnetic induction, Maxwell's equations, electromagnetic wave propagation in various media and structures, and electromagnetic radiation from charge and current distributions are treated. The relativistic covariance of Maxwell's equations is discussed. Prerequisite: PHYS 326 and PHYS 435.

Register for a lecture and one of the discussion sections.

CRN	Type	Section	Time	Days	Location	Instructor
32773	lecture	A	02:30 PM - 03:20 PM	MWF	room 144 Loomis Laboratory	Thaler, J
32766	discussion-recitation	D1	07:00 PM - 07:50 PM	M	room 139 Loomis Laboratory	Morales, J
32768	discussion-recitation	D2	08:00 PM - 08:50 PM	M	room 139 Loomis Laboratory	Morales, J

460 **Condensed Matter Physics** credit: 4 hours.

Bonding and structure of crystals; energy bands in insulators, semiconductors, and metals; electrical conductivity; optical properties; lattice vibrations; elasticity; point defects; dislocations. Offered Fall term only. Credit is not given for both PHYS 460 and MSE 304. For engineering and science majors with junior standing.

CRN	Type	Section	Time	Days	Location	Instructor
30688	lecture	A	02:00 PM - 03:20 PM	MW	room 136 Loomis Laboratory	Greene, L

485 **Atomic Phys & Quantum Theory** credit: 3 hours.

Introduction to the basic concepts of quantum theory which underlie modern theories of the properties of materials; topics covered include elements of atomic and nuclear theory; kinetic theory and statistical mechanics; quantum theory and simple applications; atomic spectra and atomic structure; molecular structure and chemical binding. Prerequisite: CHEM 104; PHYS 214; MATH 385.

CRN	Type	Section	Time	Days	Location	Instructor
30685	lecture	A	02:30 PM - 03:20 PM	MWF	room 158 Loomis Laboratory	Nayfeh, M

486 **Quantum Physics I** credit: 4 hours.

Studies atomic phenomena integrated with an introduction to quantum theory; discussion of topics includes evidence for the atomic nature of matter and the properties of the Schrodinger equation, single particle solutions in one dimension, the hydrogen atom, perturbation theory, external fields, and atomic spectroscopy of outer electrons. Prerequisite: PHYS 214; MATH 385; credit or concurrent registration in MATH 415.

Register for a lecture and a discussion section.

CRN	Type	Section	Time	Days	Location	Instructor
32793	lecture	A	09:00 AM - 10:20 AM	TR	room 136 Loomis Laboratory	Vishveshwara, S
32784	discussion-recitation	D1	07:00 PM - 07:50 PM	W	room 137 Loomis Laboratory	Link, W
32787	discussion-recitation	D2	08:00 PM - 08:50 PM	W	room 137 Loomis Laboratory	Link, W

487 **Quantum Physics II** credit: 4 hours.

Continuation of PHYS 486. Topics treated include identical particles, spectral hyperfine structure, magnetic properties of matter, atomic spectroscopy of inner electrons, high-energy photon effects, molecular binding and spectra, emission and absorption of light, and symmetry principles. Prerequisite: PHYS 486.

CRN	Type	Section	Time	Days	Location	Instructor
32796	lecture	A	09:00 AM - 10:20 AM	TR	room 158 Loomis Laboratory	Cooper, S
32796: Register for the lecture and for one of the discussion sections.						
32795	discussion-recitation	D1	07:00 PM - 07:50 PM	T	room 143 Loomis Laboratory	Link, W
32794	discussion-recitation	D2	08:00 PM - 08:50 PM	T	room 143 Loomis Laboratory	Link, W

497 **Individual Study** credit: 1 to 4 hours.

Individual study at an advanced level in a subject not covered by course offerings. Prerequisite: Consent of instructor.

Before registering for this class, students must file a project outline.

CRN	Type	Section	Time	Days	Location	Instructor
10147	independent study		ARRANGED			
10147: Instructor Approval Required						

10147: To register for PHYS 497, use the PHYS 497 CRN (available from the departmental undergraduate records office) specific to the instructor with whom you have arranged to study. (You cannot register under the general CRN 10147.)

**498 *Special Topics in Physics*** credit: 1 to 4 hours.

Lecture course on topics of current interest in physics. For advanced undergraduates or graduates. Prerequisites: Determined for each offering; see Schedule.

CRN	Type	Section	Time	Days	Location	Instructor
49783	lecture	OS	10:30 AM - 11:50 AM	TR	room 144 Loomis Laboratory	Clegg, R
49783: 3 hoursOptical Spectroscopy LectureOPTICAL SPECTROSCOPY. This is a course for students who want to acquire a more detailed molecular understanding of the interaction of radiation with molecular matter and molecular fluorescence. Both quantitative theory and experiments will be covered. The description of the experimental situations and data analysis for obtaining molecular information will be based on a solid theoretical setting that forms the framework for the course. The emphasis will be on biophysical experimental situations, using fluorescence and absorption measurements, stressing optical spectroscopic transitions involving molecular electronic and vibrational transitions. The basic interaction of the E&M field with the molecules will be covered mainly from a semi-classical point of view. The course will offer a laboratory section. Practical spectroscopy examples will demonstrate how to measure and interpret molecular properties from optical spectroscopy experiments. The course should be of interest to students with a broad range of backgrounds. Prerequisites: undergraduate courses in quantum mechanics and statistical mechanics or the consent of the instructor. Register for the OS LEC section and one of the OS1, OS2, OS3 LAB sections for a total of 4 hours credit or register for the OS LEC section only for 3 hours credit or register for one of the OS1, OS2, OS3 LAB sections only for 1 hour of credit.						
49784	laboratory	OS1	01:00 PM - 03:50 PM	R	room 6106 Engineering Sciences Bldg	Clegg, R
49784: 1 hoursOptical Spectroscopy Lab						
49785	laboratory	OS2	05:00 PM - 07:50 PM	R	room 6106 Engineering Sciences Bldg	Clegg, R
49785: 1 hoursOptical Spectroscopy Lab						
49786	laboratory	OS3	12:00 PM - 02:50 PM	F	room 6106 Engineering Sciences Bldg	Clegg, R
49786: 1 hoursOptical Spectroscopy Lab						

**499 *Senior Thesis*** credit: 3 hours.

The Senior Thesis course guides students in the writing of a senior thesis on their independent research (usually performed during the summer prior to the fall semester). Additional activities include oral presentations of research and outside journal articles, proposal writing and reviewing, poster presentation, preparation of graduate school applications, and discussion of physics frontiers with outside experts. 3 undergraduate hours. Prerequisite: PHYS 496; completion of appropriate research activity.

This course satisfies the General Education Criteria for a Advanced Composition course.

CRN	Type	Section	Time	Days	Location	Instructor
44037	lecture	A	01:00 PM - 03:50 PM	F	room 322 Loomis Laboratory	Nathan, A; Elliott, C
44037: Advanced Composition course. Instructor Approval Required						

504 **Statistical Physics** credit: 4 hours.

Single-particle distribution functions; classical and quantum mechanical systems, Boltzmann equation, virial theorem, and equations of state for gases; formal theory: ensembles, identical particles, thermodynamics of simple systems, and distribution functions; nonequilibrium problems; conservation laws and hydrodynamic equations, sound waves, and transport coefficients; plasmas, normal Fermi fluid, superfluids, and systems with internal degrees of freedom. Prerequisite: PHYS 427 and PHYS 486.

CRN	Type	Section	Time	Days	Location	Instructor
30702	lecture	A	01:00 PM - 02:20 PM	TR	room 136 Loomis Laboratory	Oono, Y

505 **Classical Electromagnetism** credit: 4 hours.

Review of Maxwell's equations followed by a relativistic formulation of the electromagnetic field and the motion of charged particles; plane and guided waves; retarded potentials; radiation from simple antennas; radiation from accelerated charged particles; synchrotron radiation, bremsstrahlung, scattering, and further topics. Prerequisite: PHYS 436 and PHYS 507.

CRN	Type	Section	Time	Days	Location	Instructor
30700	lecture	A	10:30 AM - 11:50 AM	TR	room 136 Loomis Laboratory	Mouschovias, T

510 **Nonlinear Dynamics** credit: 4 hours.

Broad introduction to nonlinear dynamics of physical systems with varying degrees of complexity; surveys a variety of concepts associated with bifurcation phenomena, mappings, nonlinear oscillations, chaotic behavior, strange attractors, solitons, and topics of current interest. Prerequisite: One of MATH 241 (formerly MATH 243), MATH 380, MATH 385; PHYS 326.

CRN	Type	Section	Time	Days	Location	Instructor
32799	lecture	A	09:30 AM - 10:20 AM	MWF	room 257 Loomis Laboratory	Hubler, A

32797	lecture	B	11:00 AM - 11:50 AM	MWF	room 257 Loomis Laboratory	Hubler, A
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515 **General Relativity I** credit: 4 hours.

Systematic introduction to Einstein's theory, with emphasis on modern coordinate-free methods of computation. Topics include: review of special relativity, modern differential geometry, foundations of general relativity, laws of physics in the presence of a gravitational field, linearized theory, and experimental tests of gravitation theories. Same as ASTR 515. Offered in alternate Fall terms. Prerequisite: PHYS 436 (includes PHYS 326).

CRN	Type	Section	Time	Days	Location	Instructor
34931	lecture	A	01:00 PM - 02:20 PM	MW	room 144 Loomis Laboratory	Shapiro, S

520 **Reactor Theory, I** credit: 4 hours.

Same as NPRE 555. See NPRE 555.

CRN	Type	Section	Time	Days	Location	Instructor
49730	lecture-discussion	A	02:00 PM - 03:50 PM	W	room 260 Mechanical Engineering Bldg	Axford, R
	lecture-discussion	A	02:00 PM - 02:50 PM	MF	room 260 Mechanical Engineering Bldg	Axford, R

561 **Condensed Matter Physics II** credit: 4 hours.

Hartree-Fock theory and electron-electron interactions; electron-phonon interactions; electron dynamics and transport; BCS theory of superconductivity; elastic properties; thermal properties due to anharmonicity; defects in solids. Prerequisite: PHYS 560 and PHYS 581.

CRN	Type	Section	Time	Days	Location	Instructor
30721	lecture	A	10:30 AM - 11:50 AM	TR	room 158 Loomis Laboratory	Phillips, P

565 **Theory Semicond & Devices** credit: 4 hours.

Same as ECE 535. See ECE 535.

CRN	Type	Section	Time	Days	Location	Instructor
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37128	discussion- recitation	E	01:00 PM - 01:50 PM	MWF	room 57 Everitt Elec and Comp Engr Lab	Leburton, J
37128: 4 hours						

569 **Emergent States of Matter** credit: 4 hours.

An introduction to the consequences of broken symmetry in condensed matter, the emergence of novel ground states, and the nature of the excitations that arise. Specific systems covered may include superconductivity, superfluidity, Bose-Einstein condensates, the quantum Hall states, liquid crystals, biological systems and patterns in Rayleigh-Benard convection. Prerequisite: PHYS 504 and PHYS 580.

CRN	Type	Section	Time	Days	Location	Instructor
47643	lecture	A	10:30 AM - 11:50 AM	MW	room 158 Loomis Laboratory	Goldenfeld, N

570 **Subatomic Physics** credit: 4 hours.

Nuclear systematics, nucleon-nucleon interaction, shell model, and single particle and collective excitations; hadron spectroscopy, hadronic quantum numbers, quark-parton model, and hadron dynamics; weak interactions. Prerequisite: PHYS 580; concurrent registration in PHYS 581.

CRN	Type	Section	Time	Days	Location	Instructor
30705	lecture	A	01:00 PM - 02:20 PM	TR	room 158 Loomis Laboratory	Peng, J

576 **Particle Physics II** credit: 4 hours.

Continuation of PHYS 575. Current topics in particle theory; topics change from year to year. Typically treats three or four different subjects in depth. Prerequisite: PHYS 575.

CRN	Type	Section	Time	Days	Location	Instructor
49709	lecture	A	02:30 PM - 03:50 PM	TR	room 136 Loomis Laboratory	Willenbrock, S

580 **Quantum Mechanics I** credit: 4 hours.

Second course in quantum mechanics for students with a good background in wave mechanics and atomic and molecular structure. Operators, state vectors, and the formal structure of quantum theory; operator treatments of simple systems; angular momentum and vector addition coefficients; stationary state perturbation theory; introduction to scattering theory for particles without spin, partial wave analysis, and Born approximation; examples taken from atomic, nuclear, and elementary particle physics. Prerequisite: PHYS 485 or PHYS 487.

CRN	Type	Section	Time	Days	Location	Instructor
30709	lecture	A	09:00 AM - 10:20 AM	TR	room 144 Loomis Laboratory	Baym, G

582 **General Field Theory** credit: 4 hours.

Covers standard techniques of field theory as used by experimenters and theorists; relativistic quantum mechanics of a single particle; Lagrangian field theories, perturbation theory, and calculation of lowest-order processes; introduction to Feynman diagrams and higher order processes; examples taken from quantum electrodynamics, solid-state and elementary particle physics, and many-body theory. Prerequisite: PHYS 581.

CRN	Type	Section	Time	Days	Location	Instructor
30717	lecture	A	02:30 PM - 03:50 PM	TR	room 158 Loomis Laboratory	Leigh, R

597 **Individual Study** credit: 1 to 16 hours.

Individual study in a subject not covered in course offerings may be arranged for credit by registration under this number. 2 to 16 hours for full term; 1 to 8 hours for half-term. Prerequisite: Consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
10150	independent study		ARRANGED			
10150: Instructor Approval Required						
10150: To register for PHYS 597, use the PHYS 597 CRN (available from the departmental graduate records office) specific to the instructor with whom you have arranged to study. (You cannot register under the general CRN 10150.)						

598 **Special Topics in Physics** credit: 1 to 4 hours.

Lecture course in topics of current interest. Several subjects are announced in each Class Schedule. Among them are semiconductor physics, magnetic resonance, surface physics, lattice dynamics, band theory of solids, crystal imperfections, nuclear structure, field theory, elementary particle physics, advanced statistical mechanics, plasma theory, astrophysics, atmospheric physics, group theory and applications. Prerequisite: Determined for each offering; see Class Schedule.

CRN	Type	Section	Time	Days	Location	Instructor
34935	lecture	AST	03:30 PM - 04:50 PM	MW	room 158 Loomis Laboratory	Lamb, F

34935: 4 hoursAstrophysicsASTROPHYSICS. Satisfies the physics graduate program "cafeteria" requirement. PHYS 598AST will survey astrophysical phenomena and processes relevant to the evolution of the Universe and structures in it, from the formation of stars and galaxies at the earliest times to the final end states of matter

as compact objects. The emphasis will be on developing an understanding based on the underlying physics. Exciting recent developments will be described. Specific topics will include big bang cosmology and the cosmic microwave background radiation; formation, interaction, and evolution of galaxies; formation, structure, and evolution of stars; dynamics of stellar systems; white dwarfs, supernovae, neutron stars, and black holes; physics of accretion disks; the fate of the universe. Topics of special current interest will include cosmological inflation, dark matter in the universe, powerful gamma-ray bursts, feeding of quasars, generation of radio and X-ray emission by supermassive black holes, gravitational lensing, sources of gravitational radiation, and the solar neutrino problem. Course work will consist of weekly homework problems, a mid-term exam, and a final exam. The course will be based on lecture notes and readings, and will be taught at the level of the Astrophysics I and II texts by Bowers and Deeming.

34933	lecture	B	10:30 AM - 11:50 AM	F	room 144 Loomis Laboratory	Stack, J
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34933: 1 hours Graduate Physics Orientation GRADUATE PHYSICS ORIENTATION: RESEARCH AND TEACHING IN THE PHYSICS DEPARTMENT. PHYS 598B is required for all new physics graduate students. It includes advice on choosing a field of research and finding a research advisor. Current graduate students will relate their experiences and advice; faculty will present overviews on the major areas of research in the Department. Physics staff will explain our computing facilities, the physics and astronomy library, and other facilities. There will be general discussions on research and instructional topics as well as ethics in teaching and research.

34940	lecture-discussion	BIO	09:00 AM - 10:50 AM	M	room 322 Loomis Laboratory	Selvin, P
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34940: 2 hours Single Molecule Biophysics This course is meant for those students interested in research in single molecule biophysics. The course is meant for those with a grasp of biophysics, but also meant for those new to the field. As such, we will go over the research of experimental members of the physics department/biophysics. In particular, we will cover the research of Paul Selvin (molecular motors, ion channels), Taekjip Ha (protein-DNA interactions and enzyme dynamics), Ido Golding (Single cell Gene Expression), Yann Chemla (High Resolution Optical Trapping) and Bob Clegg (Fluorescence Lifetime Methods and Medical Physics). In addition, we will keep current with regular readings and presentations of articles from the current literature. As such, students should be prepared to give short lectures on recent research articles.

50248	lecture	EW	03:00 PM - 04:50 PM	MW	room 104 Talbot Laboratory	Weaver, R
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50248: 4 hours Elastic Waves Meets with and is the same as TAM 518. Linear waves in one-dimensional homogeneous and inhomogeneous media (both solids and fluids), linear elastic waves in a homogeneous halfspace, scalar waves in a layer and in a layered halfspace, nonlinear diffusive waves, nonlinear dispersive waves, and the inverse scattering transform. Prerequisite: TAM 541 or MATH 556; one of TAM 514, TAM 531, TAM 551.

34934	lecture	MMA	10:30 AM - 11:50 AM	MW	room 144 Loomis Laboratory	Stone, M
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34934: 4 hours Math Methods in Physics MATHEMATICAL METHODS IN PHYSICS. PHYS 598MMA/MMB replaces PHYS 506/507 (PHYCS 411/412). PHYS 598MMA focuses on core techniques widely used in the physical sciences. Emphasis is on applications, and a broad range of illustrative examples will be explored. Primary topics include: calculus of variations and its applications; partial differential equations of mathematical physics (including classification and boundary conditions); separation of variables, series solutions of ordinary differential equations and Sturm-Liouville eigenproblems; Legendre polynomials, spherical harmonics, Bessel functions and their applications; normal mode eigenproblems (including the wave and diffusion equations); inhomogeneous ordinary differential equations (including variation of parameters and Green functions); inhomogeneous partial differential equations and Green functions; potential theory; and integral equations (including Fredholm theory). Will continue in spring semester PHYS 598MMB with complex variables, group theory, and other topics

34945	lecture	NSM	09:00 AM - 10:20 AM	MW	room 158 Loomis Laboratory	Schulten, K
<p>34945: 4 hours Nonequilibrium Statistical Mech NON-EQUILIBRIUM STATISTICAL MECHANICS. PHYS 598NSM will provide an introduction to the mathematical description of classical and quantum stochastic systems with examples from biophysics and condensed matter physics. Some of the major topics discussed in the course include: Classical Dynamics under the Influence of Stochastic Forces, Einstein and Smoluchowski Diffusion Equation, Noise-induced Limit Cycles, Diffusion-Controlled Reactions, Observables Connected with Brownian Transport, Generalized Moment Expansion of Correlation Functions, Time Series Analysis, Echoes and Hysteresis, Spin-Boson Model. Some basic knowledge of quantum mechanics and equilibrium statistical physics will be useful, but there are no formal prerequisites. Lecture notes will be available in electronic form on the web site of the course. There will be homework assignments and a term project.</p>						

599 **Thesis Research** credit: 0 to 16 hours.  
Approved for S/U grading only. May be repeated.

CRN	Type	Section	Time	Days	Location	Instructor
10154	independent study		ARRANGED			
10154: Instructor Approval Required						
10154: To register for PHYS 599, use the PHYS 599 CRN (available from the departmental graduate records office) specific to the instructor with whom you have arranged to study. (You cannot register under the general CRN 10154.)						