| CRN   | Course       | Course Title         | Course Title            |           |          |             | Credits | Status |
|-------|--------------|----------------------|-------------------------|-----------|----------|-------------|---------|--------|
| 58652 | OPT 202      | PHYSICAL OP          | TICS LAB LECT           | URE       |          | Spring 2015 | 2.0     | Open   |
|       | Schedule:    | Day                  | Begin                   | End       | Building | Room        |         |        |
|       |              | Μ                    | 900                     | 1015      | HUTCH    | 473         |         |        |
|       | Enrollment:  | Section Enroll<br>41 | <u>Section Ca</u><br>48 | <u>ip</u> |          |             |         |        |
| ]     | Instructors: | BERG D               |                         |           |          |             |         |        |

Optics

## Arts, Sciences, and Engineering

-

| CRN   | Course     | Course Title        |                         |      |          | Term        | Credits | Status |
|-------|------------|---------------------|-------------------------|------|----------|-------------|---------|--------|
| 58669 | OPT 202    | PHYSICAL OP         | FICS - LAB              |      |          | Spring 2015 | LAB     | Open   |
|       | Schedule:  | Day                 | Begin                   | End  | Building | Room        |         |        |
|       |            | Т                   | 1800                    | 2100 | WILMT    | 504         |         |        |
| E     | nrollment: | Section Enroll<br>8 | <u>Section Ca</u><br>12 | p    |          |             |         |        |
| Ir    | structors: | BERG D              |                         |      |          |             |         |        |

| CRN   | Course      | Course Title               |                         |      |          | Term        | Credits | Status |
|-------|-------------|----------------------------|-------------------------|------|----------|-------------|---------|--------|
| 58674 | OPT 202     | PHYSICAL OP                | TICS - LAB              |      |          | Spring 2015 | LAB     | Open   |
|       | Schedule:   | Day                        | Begin                   | End  | Building | Room        |         |        |
|       |             | F                          | 1300                    | 1600 | WILMT    | 504         |         |        |
| E     | Enrollment: | <u>Section Enroll</u><br>2 | <u>Section Ca</u><br>12 | קו   |          |             |         |        |
| I     | nstructors: | BERG D                     |                         |      |          |             |         |        |

| CRN   | Course       | Course Title         |                  |      |          | Term        | Credits | Status |
|-------|--------------|----------------------|------------------|------|----------|-------------|---------|--------|
| 58683 | OPT 202      | PHYSICAL OP          | TICS - LAB       |      |          | Spring 2015 | LAB     | Closed |
|       | Schedule:    | Day                  | Begin            | End  | Building | Room        |         |        |
|       |              | W                    | 1800             | 2100 | WILMT    | 504         |         |        |
| I     | Enrollment:  | Section Enroll<br>12 | Section Ca<br>12 | ар   |          |             |         |        |
| I     | Instructors: | BERG D               |                  |      |          |             |         |        |

| CRN   | Course       | Course Title        | 1                      |      | Term     | Credits | Status |      |
|-------|--------------|---------------------|------------------------|------|----------|---------|--------|------|
| 58695 | OPT 202      | PHYSICAL OF         | HYSICAL OPTICS - LAB   |      |          |         | LAB    | Open |
|       | Schedule:    | Day                 | Begin                  | End  | Building | Room    |        |      |
|       |              | R                   | 1800                   | 2100 | WILMT    | 504     |        |      |
|       | Enrollment:  | Section Enrol<br>10 | <u>Section C</u><br>12 | Cap  |          |         |        |      |
|       | Instructors: | BERG D              |                        |      |          |         |        |      |

| CRN Course Course Title Term Credits Stat | tus |
|---|-----|
|---|-----|

| 58704 | OPT 202      | PHYSICAL OF               | HYSICAL OPTICS - LAB     |            |          |      | LAB | Open |
|-------|--------------|---------------------------|--------------------------|------------|----------|------|-----|------|
|       | Schedule:    | Day                       | Begin                    | End        | Building | Room |     |      |
|       |              | F                         | 900                      | 1200       | WILMT    | 504  |     |      |
|       | Enrollment:  | <u>Section Enrol</u><br>8 | l <u>Section (</u><br>12 | <u>Cap</u> |          |      |     |      |
|       | Instructors: | BERG D                    |                          |            |          |      |     |      |

| CRN                                     | Course    | Course Title |                           |     |          | Term | Credits | Status |
|---|-----------|--------------|---------------------------|-----|----------|------|---------|--------|
| 58710                                   | OPT 204   | SOURCES/DET  | DURCES/DETECTORS LAB LECT |     |          |      | 2.0     | Open   |
|   | Schedule: | Day          | Begin                     | End | Building | Room |         |        |
|   |           | М            | 900                       | 950 | GRGEN    | 109  |         |        |
| Enrollment: <u>Section Enroll</u><br>36 |           |              | <u>Section Ca</u><br>50   | Þ   |          |      |         |        |

**Instructors:** LUKISHOVA S



Instructors: LUKISHOVA S

| CRN   | Course       | Course Title               | Course Title            |        |          |             | Credits | Status |
|-------|--------------|----------------------------|-------------------------|--------|----------|-------------|---------|--------|
| 58732 | OPT 204      | SOURCES & D                | DETECTORS LA            | B -LAB |          | Spring 2015 | LAB     | Open   |
|       | Schedule:    | Day                        | Begin                   | End    | Building | Room        |         |        |
|       |              | W                          | 1815                    | 2055   | WILMT    | 539         |         |        |
|       | Enrollment:  | <u>Section Enroll</u><br>9 | <u>Section Ca</u><br>10 | ар     |          |             |         |        |
|       | Instructors: | LUKISHOVA S                |                         |        |          |             |         |        |

| CRN   | Course     | Course Title               |                         |          |          | Term        | Credits | Status |
|-------|------------|----------------------------|-------------------------|----------|----------|-------------|---------|--------|
| 58749 | OPT 204    | SOURCES & D                | ETECTORS LAE            | 3 -LAB   |          | Spring 2015 | LAB     | Open   |
|       | Schedule:  | Day                        | Begin                   | End      | Building | Room        |         |        |
|       |            | М                          | 1815                    | 2055     | WILMT    | 539         |         |        |
| E     | nrollment: | <u>Section Enroll</u><br>9 | <u>Section Ca</u><br>10 | <u>a</u> |          |             |         |        |
| Ir    | structors: | LUKISHOVA S                |                         |          |          |             |         |        |

| CRN   | Course      | Course Title         |                  |          |          | Term        | Credits | Status |
|-------|-------------|----------------------|------------------|----------|----------|-------------|---------|--------|
| 58755 | OPT 204     | SOURCES & D          | ETECTORS LA      | B -LAB   |          | Spring 2015 | LAB     | Closed |
|       | Schedule:   | Day                  | Begin            | End      | Building | Room        |         |        |
|       |             | Т                    | 1815             | 2055     | WILMT    | 539         |         |        |
| E     | nrollment:  | Section Enroll<br>10 | Section Ca<br>10 | <u>q</u> |          |             |         |        |
| I     | nstructors: | LUKISHOVA S          |                  |          |          |             |         |        |

| CRN   | Course      | Course Title   |                             |      |          | Term | Credits | Status |
|-------|-------------|----------------|-----------------------------|------|----------|------|---------|--------|
| 82042 | OPT 204     | SOURCES & D    | OURCES & DETECTORS LAB -LAB |      |          |      | LAB     | Open   |
|       | Schedule:   | Day            | Begin                       | End  | Building | Room |         |        |
|       |             | F              | 900                         | 1200 | WILMT    | 539  |         |        |
| E     | inrollment: | Section Enroll | <u>Section Ca</u><br>10     | Þ    |          |      |         |        |
| I     | nstructors: | LUKISHOVA S    |                             |      |          |      |         |        |

| CRN  | Course     | Course Title                                      |                         |           |          | Term                                       | Credits                   | Status |
|--|------------|---|-------------------------|-----------|----------|--|---------------------------|--------|
| 58761  | OPT 223    | QUANTUM TH  | EORY                    |           |          | Spring 2015                                | 4.0                       | Open   |
|  | Schedule:  | Day   | Begin                   | End       | Building | Room                                       |                           |        |
|  |            | TR  | 1400                    | 1515      | GRGEN    | 109  |                           |        |
| E  | nrollment: | <u>Section Enroll</u><br>34                       | <u>Section Ca</u><br>50 | <u>10</u> |          |  |                           |        |
| Ir   | structors: | VAMIVAKAS A                                       |                         |           |          |  |                           |        |
| Prei   | equisites: | PHY 123 or 143, MTH 281 may be taken concurrently |                         |           |          |  |                           |        |
| <b>Description:</b> Intro to quantum mechanics in the context of modern optics and optimechanics as applied to electrons in crystals and in quantum wells ar properties of materials. Semiconductor junctions in photodetectors ar |            |   |                         |           |          | cal technolo<br>d the optica<br>d photoemi | gy. Wave<br>al<br>itters. |        |
| URL: http://www.optics.rochester.edu/academic_programs/bs/opt_223.html   |            |   |                         |           |          | nl   |                           |        |

Offered: Fall

| CRN   | Course      | Course Title                |                         |            |          | Term        | Credits | Status |
|-------|-------------|-----------------------------|-------------------------|------------|----------|-------------|---------|--------|
| 58776 | OPT 223     | QUANTUM TH                  | EORY - REC              |            |          | Spring 2015 | REC     | Open   |
|       | Schedule:   | Day                         | Begin                   | End        | Building | Room        |         |        |
|       |             | F                           | 1525                    | 1640       | GRGEN    | 109         |         |        |
| E     | nrollment:  | <u>Section Enroll</u><br>34 | <u>Section Ca</u><br>50 | <u>q</u> i |          |             |         |        |
| Ir    | nstructors: | VAMIVAKAS A                 |                         |            |          |             |         |        |

| CRN   | Course      | Course Title   |   |   |  | Term  | Credits                                  | Status                          |
|-------|-------------|--|---|---|--|---|--|---------------------------------|
| 58787 | OPT 225     | SOURCES ANI  | D DETECTORS   | S   |  | Spring 2015   | 4.0                                      | Open                            |
|       | Schedule:   | Day  | Begin   | End   | Building   | Room  |  |                                 |
|       |             | MW   | 1525  | 1640  | HARK   | 115   |  |                                 |
| E     | nrollment:  | Section Enroll<br>40   | <u>Section (</u><br>60  | Cap   |  |   |  |                                 |
| I     | nstructors: | ZAVISLAN J   |   |   |  |   |  |                                 |
| D     | escription: | This course pr<br>operation of o<br>and light-emit<br>register for the | ovides the ba<br>ptical sources<br>ting diodes a<br>e complemen | asic concept<br>s and photo<br>s well sever<br>tary lab, Op | s required for und<br>detectors. It cove<br>al types of photo<br>otics 204 | derstanding ra<br>ers important s<br>detectors. Stu | diometry a<br>sources suc<br>dents shoul | nd the<br>h as lasers<br>d also |

| CRN   | Course   | Course Title |       |      |          |    | Term        | Credits | Status |
|-------|----------|--------------|-------|------|----------|----|-------------|---------|--------|
| 58793 | OPT 232  | OPTO-MECHA   | NICAL |      |          |    | Spring 2015 | 4.0     | Open   |
| s     | chedule: | Day          | Begin | End  | Building | Ro | om          |         |        |
|       |          | MW           | 1650  | 1805 | DEWEY    | 21 | 10E         |         |        |

| Enrollment: | Section Enroll | Section Cap | <u>Total Enroll</u> | <u>Total Cap</u> |
|-------------|----------------|-------------|---------------------|------------------|
|             | 5              | No Cap      | 28                  | 30               |

Cross Listed: ME 232 (P), ME 432, MSC 432, OPT 232, OPT 432, TEO 432, TME 432

Instructors: GENBERG V

**Description:** The mechanical design and analysis of optical components and systems will be studied. Topics will include kinematic mounting of optical elements, the analysis of adhesive bonds, and the influence of environmental effects such as gravity, temperature, and vibration on the performance of optical systems. Additional topics include analysis of adaptive optics, the design of lightweight mirrors, thermo-optic and stress-optic (stress birefringence) effects. Emphasis will be placed on integrated analysis which includes the data transfer between optical design codes and mechanical FEA codes. A term project is required for ME 432.

Offered: Spring

| CRN   | Course      | Course Title   |                        |      |          | Term        | Credits | Status |  |
|-------|-------------|--|------------------------|------|----------|-------------|---------|--------|--|
| 58807 | OPT 244     | LENS DESIGN  |                        |      |          | Spring 2015 | 4.0     | Closed |  |
|       | Schedule:   | Day  | Begin                  | End  | Building | Room        |         |        |  |
|       |             | TR   | 940                    | 1055 | GRGEN    | 109         |         |        |  |
| E     | nrollment:  | Section Enroll<br>26   | <u>Section C</u><br>25 | ap   |          |             |         |        |  |
| I     | nstructors: | BENTLEY J  |                        |      |          |             |         |        |  |
| Pre   | requisites: | OPT 241 and OPT 242  |                        |      |          |             |         |        |  |
| D     | escription: | 3rd order aberration theory, optimization theory, global optimization, variables and constraints of various lens materials and types. Course concludes with individual lens design projects. |                        |      |          |             |         |        |  |

| CRN              | Course             | Course Title               |                          |                    |          | Term        | Credits        | Status    |
|------------------|--------------------|----------------------------|--------------------------|--------------------|----------|-------------|----------------|-----------|
| <del>58815</del> | <del>OPT 247</del> | ADVANCED TI                | HIN FILM C               | <del>OATINGS</del> |          | Spring 2015 | <del>4.0</del> | Cancelled |
|                  | Schedule:          | Day                        | Begin                    | End                | Building | Room        |                |           |
|                  |                    | MWF                        | 900                      | 950                |          |             |                |           |
| E                | nrollment:         | <u>Section Enroll</u><br>0 | <u>Sectior</u><br>No Cap | <u>n Cap</u><br>)  |          |             |                |           |
| Pre              | requisites:        | OPT 246                    |                          |                    |          |             |                |           |
|                  | Offered:           | Spring                     |                          |                    |          |             |                |           |
|                  |                    |                            |                          |                    |          |             |                |           |

| CRN   | Course    | Course Title                |                                 |                               |  |            | Term                   | Credits    | Status |
|-------|-----------|-----------------------------|---------------------------------|-------------------------------|--|------------|------------------------|------------|--------|
| 58821 | OPT 248   | VISION AND T                | HE EYE                          |                               |  |            | Spring 2015            | 4.0        | Open   |
| S     | chedule:  | Day                         | Begin                           | End                           | Building                                     | Ro         | om                     |            |        |
|       |           | TR                          | 1105                            | 1220                          | MEL  | 269        | 9                      |            |        |
| Eni   | rollment: | <u>Section Enroll</u><br>4  | <u>Section C</u><br>30          | ap <u>Total</u><br>20         | Enroll <u>Total Cap</u><br>30                |            |                        |            |        |
| Cros  | s Listed: | BCS 223, OPT                | 248 (P), OPT                    | 448, TEO 44                   | 48   |            |                        |            |        |
| Ins   | tructors: | HUNTER J                    |                                 |                               |  |            |                        |            |        |
| Des   | cription: | How the huma comparison wit | n eye's optica<br>th the design | al and neural<br>and capabili | factors process color ties of other animals' | ano<br>eye | d spatial inforr<br>s. | mation inc | ludes  |
|       | Offered:  | Spring                      |                                 |                               |  |            |                        |            |        |

 CRN
 Course
 Course Title
 Term
 Credits
 Status

 81360
 OPT 254
 NANOMETROLOGY LABORATORY
 Spring 2015
 4.0
 Open

| Schedule:      | Day   | Begin I  | End  | Building   | Room  |  |
|----------------|---|--|--|--|---|--|
|                | ТВА   |  |  | WILMT  | 504   |  |
| Enrollment:    | <u>Section Enroll</u><br>4  | <u>Section Cap</u><br>No Cap   | <u>Total Enrol</u><br>4  | <u>Total Cap</u><br>6  |   |  |
| Cross Listed:  | OPT 254 (P), PH   | HY 371   |  |  |   |  |
| Instructors:   | LUKISHOVA S;  | BIGELOW N  |  |  |   |  |
| Prerequisites: | Junior or Senior<br>243.  | standing with t  | he following co  | ourses complete  | e: OPT 201 and C  | OPT 202 or PHY   |
| Description:   | This is a require<br>consists of three<br>Scanning electro<br>Module 3. Confo<br>the University o<br>Laboratory for L<br>nanoscale surfa<br>capabilities of th<br>nanoemitters. S<br>a strong perforr<br>Junior and Senio | ed, 4-credit-hour<br>e laboratory exp<br>on microscopy (<br>ocal microscopy of<br>Rochester Inte<br>Laser Energetics<br>ce forces in solid<br>he scanning elect<br>Students are exp<br>mance in electro<br>or level. | r course for the<br>erimental mod<br>McIntyre); Mo<br>(Lukishova). T<br>grated Nanosy<br>. Topics covered<br>as and principl<br>tron microscop<br>ected to have<br>magnetism, th | e Certificate in l<br>lules accompan<br>dule 2. Atomic i<br>he laboratory o<br>vstems Center,<br>ed in the 50-mir<br>es of scanning to<br>be, and confoca<br>completed a se<br>e basics of mod | Nanoengineering<br>ied by lecture ma<br>force microscopy<br>omponents will u<br>the Institute of C<br>n lab lectures inc<br>force microscopy<br>I fluorescence m<br>quence in introdu<br>dern physics and | Program. It<br>aterials: Module 1.<br>(Papernov);<br>use the facilities of<br>Optics and the<br>lude the nature of<br>, function and<br>icroscopy of single<br>uctory physics with<br>physical optics. |

| CRN   | Course    | Course Title  |  |               |                |     | Term        | Credits | Status |  |  |
|-------|-----------|---|--|---------------|----------------|-----|-------------|---------|--------|--|--|
| 58839 | OPT 261   | INTERFERENCE  | E AND DIFFRAC  | TION          |                |     | Spring 2015 | 4.0     | Open   |  |  |
| S     | chedule:  | Day   | Begin  | End           | Building       | Ro  | om          |         |        |  |  |
|       |           | MW  | 1025   | 1140          | GRGEN          | 10  | L           |         |        |  |  |
| Eni   | rollment: | Section Enroll  | Section Cap  | Total Enrol   | Total Cap      |     |             |         |        |  |  |
|       |           | 54  | No Cap   | 54            | 80             |     |             |         |        |  |  |
| Cros  | s Listed: | OPT 261 (P), P  | HY 261   |               |                |     |             |         |        |  |  |
| Ins   | tructors: | VAMIVAKAS A   |  |               |                |     |             |         |        |  |  |
| Prere | quisites: | MTH 164, PHY  | 122 or 142   |               |                |     |             |         |        |  |  |
| Des   | cription: | Complex represent and application coherent optication | mplex representation of waves; scalar diffraction theory; Fresnel and Fraunhofer diffraction dapplication to measurement; diffraction and image formation; optical transfer function; herent optical systems, optical data processing, and holography. |               |                |     |             |         |        |  |  |
|       | URL:      | http://www.op   | tics.rochester.e   | du/academic_p | rograms/bs/opt | _26 | 1.html      |         |        |  |  |

| CRN   | Course       | Course Title                     |                     |         |       | Term        | Credits | Status |
|-------|--------------|----------------------------------|---------------------|---------|-------|-------------|---------|--------|
| 58842 | OPT 261      | INTERFEREN                       | CE AND DIF          | F - REC |       | Spring 2015 | REC     | Open   |
|       | Schedule:    | Schedule: Day Begin End Building |                     |         |       | Room        |         |        |
|       |              | W                                | 900                 | 950     | GRGEN | 109         |         |        |
|       | Enrollment:  | <u>Section Enroll</u><br>45      | <u>Sectio</u><br>50 | n Cap   |       |             |         |        |
|       | Instructors: | VAMIVAKAS A                      | A                   |         |       |             |         |        |
|       |              |                                  |                     |         |       |             |         |        |

| CRN              | Course             | Course Title        |                             |           |          | Term        | Credits         | Status    |
|------------------|--------------------|---------------------|-----------------------------|-----------|----------|-------------|-----------------|-----------|
| <del>75247</del> | <del>OPT 276</del> | BIOMEDICAL          | OPTICS                      |           |          | Spring 2015 | 4 <del>.0</del> | Cancelled |
|                  | Schedule:          | Day                 | Begin                       | End       | Building | Room        |                 |           |
|                  |                    | TR                  | 1105                        | 1220      |          |             |                 |           |
| E                | nrollment:         | Section Enroll<br>0 | <u>Section Ca</u><br>No Cap | <u>ip</u> |          |             |                 |           |

| CRN   | Course     | Course Title   |  |                          |  |                           |                     | Term                              | Credits                   | Status            |  |
|-------|------------|--|--|--------------------------|--|---------------------------|---------------------|-----------------------------------|---------------------------|-------------------|--|
| 58850 | OPT 287    | MATHEMATICA  | L METHODS F  | OR OPTIC                 | CS & PHYS  | ICS                       |                     | Spring 2015                       | 4.0                       | Closed            |  |
| S     | chedule:   | Day  | Begin  | End                      | В  | uilding                   | Ro                  | om                                |                           |                   |  |
|       |            | TR   | 1105   | 1220                     | Н  | UTCH                      | 473                 | 3                                 |                           |                   |  |
| Eni   | rollment:  | Section Enroll                                       | Section Ca   | <u>p Tot</u>             | al Enroll  | Total Ca                  | ар                  |                                   |                           |                   |  |
|       |            | 44   | No Cap   | 48                       |  | 48                        |                     |                                   |                           |                   |  |
| Cros  | s Listed:  | MTH 287, OPT   | 287 (P)  |                          |  |                           |                     |                                   |                           |                   |  |
| Ins   | tructors:  | ALONSO M   |  |                          |  |                           |                     |                                   |                           |                   |  |
| Prere | quisites:  | MTH 164  |  |                          |  |                           |                     |                                   |                           |                   |  |
| Des   | scription: | Techniques use<br>experience in t<br>optical systems | ed in mathema<br>he use of thes<br>s and schema.                 | itical stud<br>e powerfi | y of optication of optication of optication of the second se | al phenom<br>gant tools f | ena. Er<br>for dese | nphasis on ga<br>cribing, solving | ining insig<br>g and reso | pht and<br>olving |  |
|       | URL:       | http://www.op  | ttp://www.optics.rochester.edu/academic_programs/bs/opt_287.html |                          |  |                           |                     |                                   |                           |                   |  |
|       | Offered:   | Spring   | ring   |                          |  |                           |                     |                                   |                           |                   |  |

| CRN   | Course     | Course Title   |                                     |              |           |     | Term        | Credits | Status |  |
|-------|------------|--|-------------------------------------|--------------|-----------|-----|-------------|---------|--------|--|
| 58868 | OPT 307    | SEM PRACTICU   | JM                                  |              |           |     | Spring 2015 | 4.0     | Closed |  |
| S     | chedule:   | Day  | Begin                               | End          | Building  | Ro  | om          |         |        |  |
|       |            | MW   | 1525                                | 1640         | WILMT     | 116 | 5           |         |        |  |
| Eni   | rollment:  | Section Enroll   | Section Cap                         | Total Enrol  | Total Cap |     |             |         |        |  |
|       |            | 2  | 2                                   | 11           | 12        |     |             |         |        |  |
| Cros  | s Listed:  | MSC 307, MSC   | 507, OPT 307                        | (P), OPT 407 |           |     |             |         |        |  |
| Ins   | tructors:  | MCINTYRE B   |                                     |              |           |     |             |         |        |  |
| Rest  | trictions: | [O] Departmer  | O] Departmental permission required |              |           |     |             |         |        |  |
| Des   | scription: | Overview of techniques for using the SEM (Scanning Electron Microscope) and Scanning Probe |                                     |              |           |     |             |         |        |  |
|       |            | AFM, STM) and analyzing data. Students perform independent lab projects by semester's end. |                                     |              |           |     |             |         |        |  |
|       | Offered:   | Spring   |                                     |              |           |     |             |         |        |  |

|  | ei | eu. | Spi | ing |  |
|--|----|-----|-----|-----|--|
|  |    |     |     |     |  |
|  |    |     |     |     |  |

| CRN   | Course     | Course Title         |                         |       |          | Term                  | Credits     | Status |
|---|------------|----------------------|-------------------------|-------|----------|-----------------------|-------------|--------|
| 58873   | OPT 311    | OPTICS SENIC         | OR DESIGN PR            | OJECT |          | Spring 2015           | 4.0         | Open   |
|   | Schedule:  | Day                  | Begin                   | End   | Building | Room                  |             |        |
|   |            | MWF                  | 1025                    | 1115  | WILMT    | 504                   |             |        |
| Enrollment:   |            | Section Enroll<br>23 | <u>Section Ca</u><br>25 | ар    |          |                       |             |        |
| In  | structors: | KNOX W               |                         |       |          |                       |             |        |
| Prei  | equisites: | Open only to C       | Optics seniors.         |       |          |                       |             |        |
| <b>Description:</b> Documenting each stage,student teams design, buil instrument for a faculty, community or industrial spo |            |                      |                         |       |          | nd test an opt<br>or. | ical device | or     |
|   | Offered:   | Spring               |                         |       |          |                       |             |        |

| CRN   | Course      | Course Title        |                        |           |          | Term        | Credits | Status |
|-------|-------------|---------------------|------------------------|-----------|----------|-------------|---------|--------|
| 58884 | OPT 321     | SENIOR THES         | ES II                  |           |          | Spring 2015 | 4.0     | Open   |
|       | Schedule:   | Day                 | Begin                  | End       | Building | Room        |         |        |
|       |             | MWF                 | 1025                   | 1115      | WILMT    | 504         |         |        |
| I     | Enrollment: | Section Enroll<br>3 | <u>Section Ca</u><br>5 | <u>ip</u> |          |             |         |        |
| I     | nstructors: | KNOX W              |                        |           |          |             |         |        |

| CRN   | Course      | Course Title        |                        |                |          | Term        | Credits | Status |
|-------|-------------|---------------------|------------------------|----------------|----------|-------------|---------|--------|
| 58896 | OPT 390     | SUPERVISED          | TEACHING               |                |          | Spring 2015 | 4.0     | Open   |
|       | Schedule:   | Day                 | Begin                  | End            | Building | Room        |         |        |
|       |             | ТВА                 |                        |                |          |             |         |        |
| E     | nrollment:  | Section Enroll<br>0 | <u>Section (</u><br>30 | Cap            |          |             |         |        |
| Re    | strictions: | [G] Special ap      | ermission of Schoo     | l Dean require | ed       |             |         |        |

| CRN   | Course     | Course Title   |               |               |                 | Term           | Credits | Status |
|-------|------------|----------------|---------------|---------------|-----------------|----------------|---------|--------|
| 58909 | OPT 391    | INDEPENDENT    | READING       | Spring 2015   | 0.0             | Open           |         |        |
|       | Schedule:  | Day            | Begin         | End           | Building        | Room           |         |        |
|       |            | ТВА            |               |               |                 |                |         |        |
| E     | nrollment: | Section Enroll | Section C     | Сар           |                 |                |         |        |
| Pe    | strictions | C] Special an  | Dication rogu | urad [1] Parm | ission of Schoo | l Doon roquire | d       |        |
|       |            |                |               |               |                 |                | :u      |        |

| CRN   | Course        | Course Title |       |     | Term        | Credits | Status |  |
|-------|---------------|--------------|-------|-----|-------------|---------|--------|--|
| 58946 | OPT 393       | SPECIAL ESS  | AY    |     | Spring 2015 | 0.0     | Open   |  |
|       | Schedule: Day |              | Begin | End | Building    | Room    |        |  |

TBA Enrollment: <u>Section Enroll</u> 0

Section Cap 30

Restrictions: [G] Special application required [J] Permission of School Dean required

| CRN   | Course    | Course Titl | e                            | Term | Credits  | Status      |     |      |
|-------|-----------|-------------|------------------------------|------|----------|-------------|-----|------|
| 58958 | OPT 394   | UNDERGRAD   | JNDERGRADTE RSRCH INTERNSHIP |      |          | Spring 2015 | 0.0 | Open |
|       | Schedule: | Day         | Begin                        | End  | Building | Room        |     |      |
|       |           | ТВА         |                              |      |          |             |     |      |

Enrollment: Section Enroll Section Cap 0 30

| CRN  | Course   | Course Title |                          |            |          | Term        | Credits | Status |
|--|--|--------------|--------------------------|------------|----------|-------------|---------|--------|
| 58985  | OPT 395  | UNDERGRADU   | ATE REARCH               | I PROJECT  |          | Spring 2015 | 0.0     | Open   |
| E  | Schedule: Day<br>TBA<br>Enrollment: Secti<br>0 |              | Begin<br>Section (<br>30 | End<br>Cap | Building | Room        |         |        |
| <b>Restrictions:</b> [G] Special application required [J] Permission of School Dean required |  |              |                          |            |          |             |         |        |
|  |  |              |                          |            |          |             |         |        |

| CRN   | Course    | Course Title |       |     |             | Term | Credits | Status |
|-------|-----------|--------------|-------|-----|-------------|------|---------|--------|
| 59021 | OPT 396   | HONORS PRO   | JECTS |     | Spring 2015 | 0.0  | Open    |        |
|       | Schedule: | Day          | Begin | End | Building    | Room |         |        |
|       |           | ТВА          |       |     |             |      |         |        |

Enrollment: Section Enroll 0 Section Cap 30

| CRN   | Course                             | Course Title                  |   |                    |           |     | Term        | Credits | Status |  |  |
|-------|------------------------------------|-------------------------------|---|--------------------|-----------|-----|-------------|---------|--------|--|--|
| 59039 | OPT 407                            | SEM PRACTICU                  | JM  |                    |           |     | Spring 2015 | 4.0     | Closed |  |  |
| S     | Schedule: Day Begin End Building F |                               |   |                    |           |     |             |         |        |  |  |
|       |                                    | MW                            | 1525  | 1640               | WILMT     | 110 | 5           |         |        |  |  |
| Eni   | rollment:                          | Section Enroll                | Section Cap   | <u>Total Enrol</u> | Total Cap |     |             |         |        |  |  |
|       |                                    | 8                             | 4   | 11                 | 12        |     |             |         |        |  |  |
| Cros  | s Listed:                          | MSC 307, MSC                  | 507, OPT 307 (  | (P), OPT 407       |           |     |             |         |        |  |  |
| Ins   | tructors:                          | MCINTYRE B                    |   |                    |           |     |             |         |        |  |  |
| Rest  | trictions:                         | [O] Departmen                 | ital permission   | required           |           |     |             |         |        |  |  |
| Des   | cription:                          | Overview of tee (AFM, STM) an | erview of techniques for using the SEM (Scanning Electron Microscope) and Scanning Probe M, STM) and analyzing data. Students perform independent lab projects by semester's end. |                    |           |     |             |         |        |  |  |
|       | Offered:                           | Spring                        | ing   |                    |           |     |             |         |        |  |  |

| CRN         | Course                              | Course Title   |  |          |      |           |     | Term        | Credits | Status |  |
|-------------|-------------------------------------|----------------|--|----------|------|-----------|-----|-------------|---------|--------|--|
| 59042       | OPT 412                             | QUANTUM MEC    | CHANICS FOR C  | OPTICS   |      |           |     | Spring 2015 | 4.0     | Open   |  |
| S           | Schedule: Day Begin End Building Ro |                |  |          |      | Ro        | om  |             |         |        |  |
|             |                                     | TR             | 1400   | 1515     | WIL  | ЧΤ        | 116 | 5           |         |        |  |
| Enrollment: |                                     | Section Enroll | Section Cap  | Total En | roll | Total Cap |     |             |         |        |  |
|             |                                     | 9              | No Сар   | 9        |      | 25        |     |             |         |        |  |
| Cros        | s Listed:                           | OPT 412 (P), T | EO 412   |          |      |           |     |             |         |        |  |
| Ins         | tructors:                           | STROUD C       | TROUD C  |          |      |           |     |             |         |        |  |
| Des         | cription:                           | Quantum theor  | tum theory topics relevant to atomic physics, radiation theory and quantum optics. |          |      |           |     |             |         |        |  |
|             | Offered:                            | Spring         | g  |          |      |           |     |             |         |        |  |

| CRN  | Course     | Course Title  |   |   |   |   |                               | Term  | Credits  | Status               |
|--|------------|---|---|---|---|---|-------------------------------|---|--|----------------------|
| 59050  | OPT 421    | OPT PROPERT   | ES OF MATER   | IALS  |   |   |                               | Spring 2015   | 4.0  | Open                 |
| S  | chedule:   | Day   | Begin   | End   | В   | uilding   | Ro                            | om  |  |                      |
|  |            | TR  | 1105  | 1220  | W   | 'ILMT   | 116                           | 5   |  |                      |
| Enrollment:Section EnrollSection CapTotal Enroll21No Cap23 |            |   |   |   | <u>Total Cap</u><br>30                        |   |                               |   |  |                      |
| Cros   | s Listed:  | ECE 421, MSC  | CE 421, MSC 470, OPT 421 (P), TEO 421   |   |   |   |                               |   |  |                      |
| Ins  | tructors:  | WICKS G   |   |   |   |   |                               |   |  |                      |
| Prere  | quisites:  | Undergraduate   | e Quantum Med   | chanics   |   |   |                               |   |  |                      |
| Des  | scription: | Interaction of l<br>reflection, refra<br>light emission<br>solids. Plasmon<br>insulators also | ight with mate<br>action, absorpt<br>(spontaneous<br>nics. Semicond<br>discussed. | erials' electr<br>tion, scatter<br>and stimula<br>luctors and | ons, pho<br>ing, Rai<br>ted). Elo<br>their na | onons, plasm<br>nan scatterir<br>ectrooptic eff<br>nostructures | ions,<br>ng (s<br>ects<br>are | and polariton<br>pontaneous ar<br>and optical no<br>emphasized; r | s. Optical<br>nd stimula<br>onlinearition<br>metals an | ited),<br>es in<br>d |
|  | Offered:   | Spring  |   |   |   |   |                               |   |  |                      |

| CRN   | Course  | Course Title To                             |             | Credits | Status |
|-------|---------|---|-------------|---------|--------|
| 59068 | OPT 429 | CHEMICAL BONDS: FROM MOLECULES TO MATERIALS | Spring 2015 | 4.0     | Open   |

| Schedule:      | Day   | Begin  | End  | Building  | Room  |
|----------------|---|--|--|---|---|
|                | MW  | 1025   | 1140   | HYLAN   | 306   |
| Enrollment:    | <u>Section Enroll</u><br>0  | <u>Section Cap</u><br>No Cap   | <u>Total Enroll</u><br>4   | <u>Total Cap</u><br>15  |   |
| Cross Listed:  | CHM 456 (P), I  | MSC 456, OPT 4   | 29   |   |   |
| Instructors:   | KRAUSS T  |  |  |   |   |
| Prerequisites: | CHM 251 or an   | equivalent cou   | rse on introduct   | ory quantum m   | echanics  |
| Description:   | An introduction<br>bonding and a<br>length scales fi<br>on zero, one, a<br>include semico<br>polymers. Two<br>(Spring). | n to the electror<br>condensed mat<br>rom individual r<br>and two dimensi<br>nductor nanocr<br>weekly lectures | ter structure of e<br>ter physics pers<br>nolecules to ma<br>ional inorganic r<br>ystals, quantum<br>s of 75 minutes | extended mater<br>pective. The co<br>croscopic three<br>naterials at the<br>wires, carbon i<br>each. Cross list | ials systems from both a chemi<br>urse will discuss materials of al<br>dimensional crystals, but will f<br>nanometer scale. Specific topic<br>nanotubes, and conjugated<br>ed with MSC 456 & OPT 429. |
| URL:           | http://www.ch   | em.rochester.e   | du/courses/cour  | ses.php?id=36   |   |
|                |   |  |  |   |   |

Offered: Spring

| CRN   | Course     | Course Title   |   |                          |                          |     | Term        | Credits | Status |  |  |
|-------|------------|--|---|--------------------------|--------------------------|-----|-------------|---------|--------|--|--|
| 59073 | OPT 432    | OPTO-MECHAN  | NICAL   |                          |                          |     | Spring 2015 | 4.0     | Open   |  |  |
| S     | chedule:   | Day  | Begin   | End                      | Building                 | Ro  | om          |         |        |  |  |
|       |            | MW   | 1650  | 1805                     | DEWEY                    | 211 | LOE         |         |        |  |  |
| Eni   | rollment:  | <u>Section Enroll</u><br>7   | <u>Section Cap</u><br>No Cap  | <u>Total Enrol</u><br>28 | l <u>Total Cap</u><br>30 |     |             |         |        |  |  |
| Cros  | s Listed:  | ME 232 (P), ME   | E 432, MSC 432  | , OPT 232, OPT           | 432, TEO 432,            | тме | 432         |         |        |  |  |
| Ins   | tructors:  | GENBERG V  |   |                          |                          |     |             |         |        |  |  |
| Des   | scription: | The mechanica<br>will include kin<br>influence of en<br>performance of<br>of lightweight r | e mechanical design and analysis of optical components and systems will be studied. Topics<br>I include kinematic mounting of optical elements, the analysis of adhesive bonds, and the<br>luence of environmental effects such as gravity, temperature, and vibration on the<br>rformance of optical systems. Additional topics include analysis of adaptive optics, the design<br>lightweight mirrors, thermo-optic and stress-optic (stress birefringence) effects. Emphasis |                          |                          |     |             |         |        |  |  |

will be placed on integrated analysis which includes the data transfer between optical design codes and mechanical FEA codes. A term project is required for ME 432.

| CRN   | Course    | Course Title                |                              |                          |                          |       | Term            | Credits  | Status  |
|-------|-----------|-----------------------------|------------------------------|--------------------------|--------------------------|-------|-----------------|----------|---------|
| 59084 | OPT 442   | INSTRUMENTA                 | L OPTICS                     |                          |                          |       | Spring 2015     | 4.0      | Open    |
| S     | chedule:  | Day                         | Begin                        | End                      | Building                 | Ro    | om              |          |         |
|       |           | TR                          | 1230                         | 1345                     | WILMT                    | 116   | 5               |          |         |
| En    | rollment: | <u>Section Enroll</u><br>21 | <u>Section Cap</u><br>No Cap | <u>Total Enrol</u><br>22 | <u>I Total Cap</u><br>40 |       |                 |          |         |
| Cros  | s Listed: | OPT 442 (P), T              | EO 442                       |                          |                          |       |                 |          |         |
| Ins   | tructors: | BROWN T                     |                              |                          |                          |       |                 |          |         |
| Prere | quisites: | OPT 441                     |                              |                          |                          |       |                 |          |         |
| Des   | cription: | Principles and systems.     | practices for sol            | ving problems of         | of optical imagir        | ig, c | optical instrum | ents and | optical |
|       | Offered:  | Spring                      |                              |                          |                          |       |                 |          |         |

| CRN   | Course  | Course Title              | Term        | Credits | Status |
|-------|---------|---------------------------|-------------|---------|--------|
| 59096 | OPT 442 | INSTRUMENTAL OPTICS - REC | Spring 2015 | REC     | Open   |

| Schedule:    | Day                  | Begin                   | End  | Building | Room |
|--------------|----------------------|-------------------------|------|----------|------|
|              | F                    | 1025                    | 1115 | GRGEN    | 110  |
| Enrollment:  | Section Enroll<br>19 | <u>Section Ca</u><br>35 | ар   |          |      |
| Instructors: | BROWN T              |                         |      |          |      |

| CRN   | Course     | Course Title                   |   |                          |                                 |     | Term        | Credits | Status |  |  |
|-------|------------|--------------------------------|---|--------------------------|---------------------------------|-----|-------------|---------|--------|--|--|
| 59117 | OPT 444    | LENS DESIGN                    |   |                          |                                 |     | Spring 2015 | 4.0     | Closed |  |  |
| S     | chedule:   | Day                            | Begin   | End                      | Building                        | Ro  | om          |         |        |  |  |
|       |            | TR                             | 1525  | 1640                     | GRGEN                           | 109 | )           |         |        |  |  |
| Eni   | rollment:  | <u>Section Enroll</u><br>25    | <u>Section Cap</u><br>No Cap  | <u>Total Enrol</u><br>25 | <u>I</u> <u>Total Cap</u><br>25 |     |             |         |        |  |  |
| Cros  | s Listed:  | OPT 444 (P), T                 | EO 444  |                          |                                 |     |             |         |        |  |  |
| Ins   | tructors:  | BENTLEY J                      |   |                          |                                 |     |             |         |        |  |  |
| Des   | scription: | 3rd order aber of various lens | d order aberration theory, optimization theory, global optimization, variables and constraints various lens materials and types. Course concludes with individual lens design projects. |                          |                                 |     |             |         |        |  |  |

| CRN   | Course        | Course Title         |                         |          |          | Term        | Credits | Status |
|-------|---------------|----------------------|-------------------------|----------|----------|-------------|---------|--------|
| 59126 | OPT 444       | LENS DESIGN - REC    |                         |          |          | Spring 2015 | REC     | Open   |
|       | Schedule: Day |                      | Begin                   | End      | Building | Room        |         |        |
|       |               | R                    | 1650                    | 1805     | GRGEN    | 109         |         |        |
| E     | nrollment:    | Section Enroll<br>19 | <u>Section Ca</u><br>50 | <u>p</u> |          |             |         |        |
| I     | nstructors:   | BENTLEY J            |                         |          |          |             |         |        |

| CRN              | Course             | Course Title   |              |       |          | Term        | Credits        | Status    |
|------------------|--------------------|----------------|--------------|-------|----------|-------------|----------------|-----------|
| <del>59134</del> | <del>OPT 447</del> | ADVANCED T     | HIN FILM COA | TINGS |          | Spring 2015 | <del>4.0</del> | Cancelled |
|                  | Schedule:          | Day            | Begin        | End   | Building | Room        |                |           |
|                  |                    | MWF            | 900          | 950   |          |             |                |           |
| E                | nrollment:         | Section Enroll | Section C    | ар    |          |             |                |           |
|                  |                    | 0              | 5            |       |          |             |                |           |
| Prer             | equisites:         | OPT 246        |              |       |          |             |                |           |
|                  | Offered:           | Spring         |              |       |          |             |                |           |

| CRN         | Course  | Course Title  |                |             |             |     | Term        | Credits | Status |
|-------------|---|---|----------------|-------------|-------------|-----|-------------|---------|--------|
| 59143       | OPT 448   | VISION AND T  | HE EYE         |             |             |     | Spring 2015 | 4.0     | Open   |
| S           | Schedule:   | Day   | Begin          | End         | Building    | Ro  | om          |         |        |
|             |   | TR  | 1105           | 1220        | MEL         | 269 | 9           |         |        |
| Enrollment: |   | Section Enroll  | Section Cap    | Total Enrol | I Total Cap |     |             |         |        |
|             |   | 8   | 30             | 20          | 30          |     |             |         |        |
| Cros        | ss Listed:  | BCS 223, OPT  | 248 (P), OPT 4 | 48, TEO 448 |             |     |             |         |        |
| Ins         | structors:  | HUNTER J  |                |             |             |     |             |         |        |
| Des         | Description: How the human eye's optical and neural factors process color and spatial information inc |   |                |             |             |     |             | ludes   |        |
|             |   | comparison with the design and capabilities of other animals' eyes. |                |             |             |     |             |         |        |
|             | Offered:  | Spring  |                |             |             |     |             |         |        |

| CRN   | Course   | Course Title         |                              |          |              |               |               |     | Term        | Credits | Status |
|-------|----------|----------------------|------------------------------|----------|--------------|---------------|---------------|-----|-------------|---------|--------|
| 75218 | OPT 450  | POLARIZATION         | 1                            |          |              |               |               |     | Spring 2015 | 4.0     | Open   |
| Sc    | chedule: | Day                  | Begin                        | End      | E            | Build         | ling          | Ro  | om          |         |        |
|       |          | W                    | 1815                         | 2115     | 5 0          | GRGE          | EN            | 110 | )           |         |        |
| Enro  | ollment: | Section Enroll<br>10 | <u>Section Cap</u><br>No Cap | <u>1</u> | Total Enroll | <u>T</u><br>2 | otal Cap<br>0 |     |             |         |        |

Cross Listed: OPT 450 (P), TEO 450

Instructors: BROWN T

**Description:** The physics and engineering of polarized light, including polarization ray tracing and polarization in high numerical aperture focusing.

| CRN   | Course       | Course Title         |                             |          | Term     | Credits     | Status |      |
|-------|--------------|----------------------|-----------------------------|----------|----------|-------------|--------|------|
| 59151 | OPT 456      | OPTICS LABO          | RATORY                      |          |          | Spring 2015 | 4.0    | Open |
|       | Schedule:    | Day                  | Begin                       | End      | Building | Room        |        |      |
|       |              | MW                   | 1300                        | 1600     | WILMT    | 504         |        |      |
|       | Enrollment:  | Section Enroll<br>15 | <u>Section Ca</u><br>No Cap | <u>q</u> |          |             |        |      |
| 1     | Instructors: | MARCIANTE J          |                             |          |          |             |        |      |

| CRN   | Course    | Course Title                     |                                      |                         |                           |     | Term           | Credits   | Status |
|-------|-----------|----------------------------------|--------------------------------------|-------------------------|---------------------------|-----|----------------|-----------|--------|
| 59165 | OPT 462   | Electromagnet                    | ic Waves                             |                         |                           |     | Spring 2015    | 4.0       | Open   |
| S     | chedule:  | Day                              | Begin                                | End                     | Building                  | Ro  | om             |           |        |
|       |           | TR                               | 940                                  | 1055                    | WILMT                     | 110 | 5              |           |        |
| En    | rollment: | <u>Section Enroll</u><br>15      | <u>Section Cap</u><br>No Cap         | <u>Total Enro</u><br>15 | II <u>Total Cap</u><br>30 |     |                |           |        |
| Cros  | s Listed: | OPT 462 (P), T                   | EO 462                               |                         |                           |     |                |           |        |
| Ins   | tructors: | AGRAWAL G                        |                                      |                         |                           |     |                |           |        |
| Des   | cription: | Electromagnet<br>Pertaining topi | ic theory as a fo<br>cs reviewed and | oundation for cl        | assical descripti<br>n.   | ons | of many optica | al phenom | iena.  |
|       | Offered:  | Spring                           |                                      |                         |                           |     |                |           |        |

| CRN   | Course    | Course Title                                   |  |  |  |              | Term                             | Credits                  | Status |
|-------|-----------|--|--|--|--|--------------|----------------------------------|--------------------------|--------|
| 59178 | OPT 465   | PRINCIPLES O                                   | F LASERS   |  |  |              | Spring 2015                      | 4.0                      | Open   |
| S     | chedule:  | Day  | Begin  | End  | Building   | Ro           | om                               |                          |        |
|       |           | М  | 1700   | 2000   | GRGEN  | 109          | )                                |                          |        |
| Enr   | ollment:  | Section Enroll<br>10                           | <u>Section Cap</u><br>50                         | <u>Total Enrol</u><br>11                               | l <u>Total Cap</u><br>50                             |              |                                  |                          |        |
| Cros  | s Listed: | MSC 465, OPT                                   | 465 (P), PHY 4                                   | 35, TEO 465  |  |              |                                  |                          |        |
| Ins   | tructors: | GUO C  |  |  |  |              |                                  |                          |        |
| Des   | cription: | Topics include<br>homogeneous<br>schemes, rate | quantum mech<br>and inhomogen<br>equations, Q-sv | anical treatmen<br>eous broadenin<br>witching for vari | ts to two-level a<br>g, laser resonat<br>ous lasers. | atom<br>ors, | ic systems, og<br>cavity design, | otical gain<br>, pumping | 7      |

| CRN              | Course             | Course Title                        | Term        | Credits         | Status    |
|------------------|--------------------|-------------------------------------|-------------|-----------------|-----------|
| <del>59180</del> | <del>OPT 468</del> | WAVEGUIDES & OPTOELECTRONIC DEVICES | Spring 2015 | 4 <del>.0</del> | Cancelled |

| Schedule:   | Day            | Begin      | End       | Building | Room |
|-------------|----------------|------------|-----------|----------|------|
|             | TR             | 940        | 1055      |          |      |
| Enrollment: | Section Enroll | Section Ca | <u>ap</u> |          |      |
|             | 0              | No Cap     |           |          |      |
| Offered:    | Fall           |            |           |          |      |

| CRN   | Course       | Course Title                |                            |                               |   | Term           | Credits     | Status  |
|-------|--------------|-----------------------------|----------------------------|-------------------------------|---|----------------|-------------|---------|
| 59199 | OPT 481      | TECHNICAL E                 | TECHNICAL ENTREPRENEURSHIP |                               |   |                | 4.0         | Open    |
|       | Schedule:    | Day                         | Begin                      | End                           | Building                                | Room           |             |         |
|       |              | Т                           | 1815                       | 2055                          | SCHGL                                   | 407            |             |         |
|       | Enrollment:  | Section Enroll<br>22        | <u>Sectior</u><br>30       | n Cap                         |   |                |             |         |
|       | Instructors: | MOORE D                     |                            |                               |   |                |             |         |
|       | Description: | Analysis of en companies. A | trepreneurs<br>range of m  | ship from the<br>anagement is | perspective of sta<br>sues is discussed | art-up venture | s and estal | olished |
|       | Offered:     | Sprina                      |                            |                               |   |                |             |         |

| CRN   | Course    | Course Title   |             |             |             |     | Term        | Credits | Status |
|-------|-----------|----------------|-------------|-------------|-------------|-----|-------------|---------|--------|
| 59206 | OPT 482   | PRODUCT DEV    | & TECH MGMT |             |             |     | Spring 2015 | 4.0     | Open   |
| S     | chedule:  | Day            | Begin       | End         | Building    | Ro  | om          |         |        |
|       |           | MW             | 1815        | 1930        | GAVET       | 310 | )           |         |        |
| Eni   | rollment: | Section Enroll | Section Cap | Total Enrol | I Total Cap |     |             |         |        |
|       |           | 5              | No Cap      | 33          | 35          |     |             |         |        |
| Cros  | s Listed: | OPT 482, TEM   | 441 (P)     |             |             |     |             |         |        |
| -     |           |                |             |             |             |     |             |         |        |

Instructors: EASTMAN J

**Description:** In this class we will explore system engineering via the ISO9000 product development process and will illustrate how to use this process to develop both products and research systems that meet necessary specifications. The first eight weeks emphasize system integration including the development of the product development plans, partitioning of a system into subsystems, quantitative analysis of system performance and the role of prototypes. The second half of the semester emphasizes the planning needed to take systems to manufacture. During the course the students will prepare a product development plan on a project that was selected during TEM 440 Screening Technical Opportunities. The course is intended to be interactive. A portion of the classes will be dedicated to "brain-storming" solutions to technical problems and formal design reviews where the students will review the project plans of other students.

| CRN   | Course      | Course Title   |            |        |          | Term        | Credits | Status |
|-------|-------------|----------------|------------|--------|----------|-------------|---------|--------|
| 59219 | OPT 491     | MASTER'S REA   | ADING IN C | OPTICS |          | Spring 2015 | 0.0     | Open   |
|       | Schedule:   | Day            | Begin      | End    | Building | Room        |         |        |
|       |             | ТВА            |            |        |          |             |         |        |
| E     | Inrollment: | Section Enroll | Sectior    | п Сар  |          |             |         |        |
|       |             | 0              | 30         |        |          |             |         |        |
|       |             |                |            |        |          |             |         |        |

| CRN   | Course     | Course Title   |           |     |          | Term        | Credits | Status |
|-------|------------|----------------|-----------|-----|----------|-------------|---------|--------|
| 59222 | OPT 494    | RESEARCH IN    | OPTICS    |     |          | Spring 2015 | 0.0     | Open   |
|       | Schedule:  | Day            | Begin     | End | Building | Room        |         |        |
|       |            | TBA            |           |     |          |             |         |        |
| E     | nrollment: | Section Enroll | Section ( | Cap |          |             |         |        |
|       |            | 0              | 30        |     |          |             |         |        |

| CRN                 | Course  | Course Title   |   |                             |                          | Term                               | Credits        | Status                |
|---------------------|---|--|---|-----------------------------|--------------------------|------------------------------------|----------------|-----------------------|
| 59241               | OPT 495   | MASTER'S RE  | SEARCH IN                                       | OPTICS                      |                          | Spring 2015                        | 0.0            | Open                  |
| E                   | Schedule:                                       | <b>Day</b><br>TBA  | Begin   | End                         | Building                 | Room                               |                | -                     |
| E                   | nrollment:                                      | Section Enroll   | <u>Sectio</u><br>30                             | n Cap                       |                          |                                    |                |                       |
|                     |   |  |   |                             |                          |                                    |                |                       |
|                     |   |  |   |                             |                          |                                    |                |                       |
| CRN                 | Course  | Course Title   |   |                             |                          | Term                               | Credits        | Status                |
| <b>CRN</b><br>75435 | Course  | Course Title   | 1AGING  |                             |                          | <b>Term</b><br>Spring 2015         | Credits<br>4.0 | <b>Status</b><br>Open |
| <b>CRN</b><br>75435 | Course OPT 561 Schedule:                        | Course Title<br>ADVANCED IN<br>Day   | 1AGING<br><b>Begin</b>                          | End                         | Building                 | Term<br>Spring 2015<br>Room        | Credits<br>4.0 | <b>Status</b><br>Open |
| <b>CRN</b><br>75435 | Course OPT 561 Schedule:                        | Course Title<br>ADVANCED IN<br>Day<br>MW                                     | 1AGING<br><b>Begin</b><br>1025                  | <b>End</b><br>1140          | <b>Building</b><br>GRGEN | Term<br>Spring 2015<br>Room<br>110 | Credits<br>4.0 | <b>Status</b><br>Open |
| CRN<br>75435<br>E   | Course<br>OPT 561<br>Schedule:<br>nrollment:    | Course Title<br>ADVANCED IN<br>Day<br>MW<br>Section Enroll<br>14             | 1AGING<br>Begin<br>1025<br><u>Section</u><br>30 | <b>End</b><br>1140<br>n Cap | <b>Building</b><br>GRGEN | Term<br>Spring 2015<br>Room<br>110 | Credits<br>4.0 | <b>Status</b><br>Open |
| CRN<br>75435<br>E   | Course OPT 561 Schedule: nrollment: nstructors: | Course Title<br>ADVANCED IN<br>Day<br>MW<br>Section Enroll<br>14<br>FIENUP J | 1AGING<br>Begin<br>1025<br><u>Section</u><br>30 | <b>End</b><br>1140<br>n Cap | <b>Building</b><br>GRGEN | Term<br>Spring 2015<br>Room<br>110 | Credits<br>4.0 | <b>Status</b><br>Open |

**Description:** Advanced topics in imaging, concentrating on computed imaging, Fourier-transform-based imaging, and unconventional imaging, with emphasis on imaging through aberrating media (particularly atmospheric turbulence), in mathematical depth.

| CRN   | Course      | Course Title               |                      |     |          | Term        | Credits | Status |
|-------|-------------|----------------------------|----------------------|-----|----------|-------------|---------|--------|
| 59288 | OPT 591     | PHD READING                | COURSE               |     |          | Spring 2015 | 0.0     | Open   |
|       | Schedule:   | <b>Day</b><br>TBA          | Begin                | End | Building | Room        |         |        |
|       | Enrollment: | <u>Section Enroll</u><br>0 | <u>Section</u><br>30 | Cap |          |             |         |        |
|       |             |                            |                      |     |          |             |         |        |

| CRN   | Course     | Course Title               |                         |          |          | Term        | Credits | Status |
|-------|------------|----------------------------|-------------------------|----------|----------|-------------|---------|--------|
| 59345 | OPT 594    | INTERNSHIP                 |                         |          |          | Spring 2015 | 0.0     | Open   |
|       | Schedule:  | <b>Day</b><br>TBA          | Begin                   | End      | Building | Room        |         |        |
| Eı    | nrollment: | <u>Section Enroll</u><br>0 | <u>Section Ca</u><br>30 | <u>q</u> |          |             |         |        |

| CRN   | Course     | Course Title   |             |          | Term        | Credits | Status |  |
|-------|------------|----------------|-------------|----------|-------------|---------|--------|--|
| 59359 | OPT 595    | PHD RESEARCI   | H IN OPTICS |          | Spring 2015 | 0.0     | Open   |  |
|       | Schedule:  | Day            | Begin       | End      | Building    | Room    |        |  |
|       |            | ТВА            |             |          |             |         |        |  |
| E     | nrollment: | Section Enroll | Section Ca  | <u>p</u> |             |         |        |  |
|       |            | 0              | 50          |          |             |         |        |  |

| CRN   | Course    | Course Titl | e                      |      |  | Term        | Credits | Status |
|-------|-----------|-------------|------------------------|------|--|-------------|---------|--------|
| 59532 | OPT 595A  | PHD RESEA   | RCH IN ABSE            | NTIA |  | Spring 2015 | 0.0     | Open   |
|       | Schedule: | Day         | Day Begin End Building |      |  |             |         |        |
|       |           | ТВА         | BA                     |      |  |             |         |        |

Enrollment: Section Enroll 0 Section Cap 30

**Restrictions:** [G] Special application required [J] Permission of School Dean required

| CRN   | Course      | Course Title   |            |          |          | Term        | Credits |
|-------|-------------|----------------|------------|----------|----------|-------------|---------|
| 59549 | OPT 595B    | PHD RSRCH I    | N ABSENTIA | A ABROAD |          | Spring 2015 | 0.0     |
|       | Schedule:   | Day            | Begin      | End      | Building | Room        |         |
|       |             | ТВА            |            |          |          |             |         |
|       | Enrollment: | Section Enroll | Section    | Сар      |          |             |         |
|       |             | 0              | 30         |          |          |             |         |

Restrictions: [G] Special application required [J] Permission of School Dean required

| CRN              | Course             | Course Title        |                             |           |             | Term           | Credits   | Status |
|------------------|--------------------|---------------------|-----------------------------|-----------|-------------|----------------|-----------|--------|
| <del>59576</del> | <del>OPT 890</del> | SUMMER IN RES       | SIDENCE                     |           | Spring 2015 | <del>0.0</del> | Cancelled |        |
|                  | Schedule:          | Day B               | egin                        | End       | Building    | Room           |           |        |
| E                | nrollment:         | Section Enroll<br>0 | <u>Section Ca</u><br>No Cap | <u>ap</u> |             |                |           |        |

| CRN   | Course     | Course Title               | ourse Title                |     |          |             | Credits | Status |
|-------|------------|----------------------------|----------------------------|-----|----------|-------------|---------|--------|
| 59587 | OPT 895    | CONT OF MAST               | INT OF MASTER'S ENROLLMENT |     |          | Spring 2015 | 0.0     | Open   |
|       | Schedule:  | Day B<br>TBA               | egin                       | End | Building | Room        |         |        |
| Eı    | nrollment: | <u>Section Enroll</u><br>0 | <u>Section C</u><br>30     | ap  |          |             |         |        |

| CRN   | Course     | Course Title               |                             |     | Term     | Credits | Status |      |
|-------|------------|----------------------------|-----------------------------|-----|----------|---------|--------|------|
| 59593 | OPT 897    | MASTER'S DIS               | ASTER'S DISSERTATION        |     |          |         | 0.0    | Open |
|       | Schedule:  | Day                        | Begin                       | End | Building | Room    |        |      |
|       |            | ТВА                        |                             |     |          |         |        |      |
| E     | nrollment: | <u>Section Enroll</u><br>0 | <u>Section Ca</u><br>No Cap | םו  |          |         |        |      |

| CRN   | Course   | Course Title         | Term        | Credits | Status |
|-------|----------|----------------------|-------------|---------|--------|
| 84400 | OPT 897B | MASTER'S IN ABSENTIA | Spring 2015 | 0.0     | Open   |

| Schedule: Day | Begin | End | Building | Room |  |
|---------------|-------|-----|----------|------|--|
|---------------|-------|-----|----------|------|--|

TBA
Enrollment: <u>Section Enroll</u> <u>Section Cap</u>

0

No Cap

| CRN   | Course    | Course T | itle                   | Term | Credits     | Status |      |  |
|-------|-----------|----------|------------------------|------|-------------|--------|------|--|
| 59623 | OPT 899   | MASTER'S | DISSERTATION           | N    | Spring 2015 | 0.0    | Open |  |
|       | Schedule: | Day      | Day Begin End Building |      |             | Room   |      |  |
|       |           | ТВА      | TBA                    |      |             |        |      |  |

Enrollment: Section Enroll 0 Section Cap 0 No Cap

| CRN   | Course     | Course Title               |                            |           |          | Term        | Credits | Status |
|-------|------------|----------------------------|----------------------------|-----------|----------|-------------|---------|--------|
| 59637 | OPT 985    | LEAVE OF ABSE              | ENCE                       |           |          | Spring 2015 | 0.0     | Open   |
|       | Schedule:  | Day I<br>TBA               | Begin                      | End       | Building | Room        |         |        |
| E     | nrollment: | <u>Section Enroll</u><br>0 | <u>Section C</u><br>No Cap | <u>ap</u> |          |             |         |        |

| CRN   | Course       | Course Title        | ourse Title                 |                 |               |                | Credits | Status |
|-------|--------------|---------------------|-----------------------------|-----------------|---------------|----------------|---------|--------|
| 59646 | OPT 986V     | FULL TIME VISI      | TING STUDE                  | NT              |               | Spring 2015    | 0.0     | Open   |
|       | Schedule:    | Day B               | egin                        | End             | Building      | Room           |         |        |
| E     | nrollment:   | Section Enroll<br>3 | <u>Section Ca</u><br>No Cap | ар              |               |                |         |        |
| Re    | estrictions: | [G] Special appl    | ication requi               | red [J] Permiss | sion of Schoo | l Dean require | ed      |        |

| CRN   | Course       | Course Title        |                            |             | Term               | Credits        | Status |  |
|-------|--------------|---------------------|----------------------------|-------------|--------------------|----------------|--------|--|
| 59658 | OPT 987V     | PART TIME VIS       | ITING STUD                 | ENT         | Spring 2015        | 0.0            | Open   |  |
|       | Schedule:    | Day I               | Begin                      | End         | Room               |                |        |  |
|       |              | ТВА                 |                            |             |                    |                |        |  |
| E     | nrollment:   | Section Enroll<br>0 | <u>Section C</u><br>No Cap | Cap         |                    |                |        |  |
| Re    | estrictions: | [G] Special app     | lication requ              | ired [J] Pe | ermission of Schoo | l Dean require | ed     |  |

| 59660     OPT 995     CONT OF DOCTORAL ENROLLMENT     Spring 2015     0.0     Open       Schedule:     Day     Begin     End     Building     Room       TBA     TBA     Section Enroll     Section Cap     No Cap | CRN   | Course     | Course Title               |                            |        | Term        | Credits | Status |  |
|--|-------|------------|----------------------------|----------------------------|--------|-------------|---------|--------|--|
| Schedule:DayBeginEndBuildingRoomTBAEnrollment:Section Enroll<br>2Section Cap<br>No Cap   | 59660 | OPT 995    | CONT OF DOC                | TORAL ENRO                 | LLMENT | Spring 2015 | 0.0     | Open   |  |
| Enrollment: Section Enroll Section Cap<br>2 No Cap   |       | Schedule:  | <b>Day</b><br>TBA          | Begin                      | End    | Building    | Room    |        |  |
|  | E     | nrollment: | <u>Section Enroll</u><br>2 | <u>Section (</u><br>No Cap | Cap    |             |         |        |  |

| CRN   | Course      | Course Title               |                             |           |          | Term        | Credits | Status |
|-------|-------------|----------------------------|-----------------------------|-----------|----------|-------------|---------|--------|
| 59671 | OPT 997     | DOCTORAL DIS               | SERATION                    |           |          | Spring 2015 | 0.0     | Open   |
|       | Schedule:   | Day E<br>TBA               | Begin                       | End       | Building | Room        | _       |        |
|       | Enrollment: | <u>Section Enroll</u><br>0 | <u>Section Ca</u><br>No Cap | <u>ip</u> |          |             |         |        |

| CRN   | Course    | Course T | itle                       |     |          | Term | Credits | Status |
|-------|-----------|----------|----------------------------|-----|----------|------|---------|--------|
| 59727 | OPT 997A  | DOCT DIS | OCT DISSERTATN IN ABSENTIA |     |          |      | 0.0     | Open   |
|       | Schedule: | Day      | Begin                      | End | Building | Room |         |        |
|       |           | TBA      |                            |     |          |      |         |        |

Enrollment: Section Enroll Section Cap 0

No Cap

Restrictions: [G] Special application required [J] Permission of School Dean required

| CRN   | Course     | Course Title   |                             |     |          | Term        | Credits | S |
|-------|------------|----------------|-----------------------------|-----|----------|-------------|---------|---|
| 59740 | OPT 997B   | PHD IN ABSEN   | TIA ABROAD                  |     |          | Spring 2015 | 0.0     | 0 |
|       | Schedule:  | Day            | Begin                       | End | Building | Room        |         |   |
| E     | nrollment: | Section Enroll | <u>Section Ca</u><br>No Cap | ар  |          |             |         |   |

Restrictions: [G] Special application required [J] Permission of School Dean required

| CRN   | Course     | Course Title               |                             |     | Term        | Credits | Status |  |
|-------|------------|----------------------------|-----------------------------|-----|-------------|---------|--------|--|
| 59769 | OPT 999    | DOCTORAL DIS               | SERTATION                   |     | Spring 2015 | 0.0     | Open   |  |
|       | Schedule:  | <b>Day E</b><br>TBA        | Begin                       | End | Building    | Room    |        |  |
| E1    | nrollment: | <u>Section Enroll</u><br>0 | <u>Section Ca</u><br>No Cap | p   |             |         |        |  |

| CRN   | Course       | Course Title               | Course Title                |             |                   |                |    | Status |
|-------|--------------|----------------------------|-----------------------------|-------------|-------------------|----------------|----|--------|
| 59944 | OPT 999A     | DOCT DISSERT               | ATN IN ABSE                 | Spring 2015 | 0.0               | Open           |    |        |
|       | Schedule:    | Day I                      | Begin                       | End         | Room              |                |    |        |
|       |              | ТВА                        |                             |             |                   |                |    |        |
| E     | Inrollment:  | <u>Section Enroll</u><br>0 | <u>Section Ca</u><br>No Cap | ар          |                   |                |    |        |
| R     | estrictions: | [G] Special app            | lication requi              | ired [J] Pe | rmission of Schoo | l Dean require | ed |        |

| CRN   | Course    | Course Ti | tle         |        |          | Term        | Credits | Status |
|-------|-----------|-----------|-------------|--------|----------|-------------|---------|--------|
| 59966 | OPT 999B  | DOC DISS  | IN-ABSENTIA | ABROAD |          | Spring 2015 | 0.0     | Open   |
|       | Schedule: | Day       | Begin       | End    | Building | Room        |         |        |
|       |           | ТВА       |             |        |          |             |         |        |

Enrollment: Section Enroll 2 Section Cap No Cap

Restrictions: [G] Special application required [J] Permission of School Dean required

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