## Photonics Concentration

**2018-2019**

**Catalog Term:** 201808

### SAMPLE PLAN

**BSEE**

**Photonics Concentration**

<table>
<thead>
<tr>
<th>Year 1 Fall</th>
<th>Year 1 Spring</th>
<th>Year 2 Fall</th>
<th>Year 2 Spring</th>
<th>Year 3 Fall</th>
<th>Year 3 Spring</th>
<th>Year 4 Fall</th>
<th>Year 4 Spring</th>
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</thead>
<tbody>
<tr>
<td>MA1160/61 (4) Calculus I</td>
<td>MA2110 (4) Calculus II</td>
<td>MA3160 (4) Multi-Variable Calculus</td>
<td>EE1111 (1) Essential Math (track A)</td>
<td>EE2190 (3) Intro to Photonics</td>
<td>EE3180 (3) Intro to Probability &amp; Random Sig. Anal.</td>
<td>EE4901 (2) EE Design 1</td>
<td><strong>EE Elective (3)</strong></td>
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<tr>
<td>CH1150/51 (4) &amp;/or CH1153 (1) Univ Chem I</td>
<td>EE1111 (1) ECE 1.0 (track B)</td>
<td>EE2112 (4) Electric Circuits II &amp; Lab</td>
<td>CS1111 (3) Intro C++ Programming</td>
<td>EE3190 (3) Optical Sensing &amp; Imaging</td>
<td>EE3290 (4) Photonic Mtl &amp; Devices w/ Lab</td>
<td><strong>Photonics Elective (3)</strong></td>
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<tr>
<td>PH1100 (1) Physics I Lab</td>
<td>PH1200 (1) Physics II Lab</td>
<td>EE3140 (3) Electromagnetics</td>
<td>EE2174 (4) Digital Logic &amp; Lab</td>
<td>EE3131 (4) Electronics and Lab</td>
<td>EE3261 (3) Control Systems</td>
<td>EE3261 (3) Laser Systems &amp; Apps</td>
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<tr>
<td>PH2100 (3) Physics I</td>
<td>PH2200 (3) Univ. Physics 2</td>
<td>MA2160</td>
<td>MA3520/1 PH2200</td>
<td>MA3521/20</td>
<td>MA3521/20</td>
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<tr>
<td>MA1160</td>
<td>EN11010 (3) Engr Analysis</td>
<td>MA2160</td>
<td>MA3520</td>
<td>MA321200</td>
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<td>MA1160</td>
<td>EN11020 (3) MODEL &amp; DESIGN</td>
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<td>EN2950(1)</td>
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<tr>
<td><strong>1) HASS HU,FA</strong></td>
<td><strong>1) Critical/creative thinking core</strong></td>
<td><strong>1) HASS Comm/Composition</strong></td>
<td><strong>2) SELECT Approved Electives (3)</strong></td>
<td><strong>3) Approved Electives (3)</strong></td>
<td><strong>4) EE Elective (3)</strong></td>
<td><strong>5) Enterprise route</strong></td>
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<td><strong>14.5/15.5</strong></td>
<td><strong>16</strong></td>
<td><strong>17</strong></td>
<td><strong>17</strong></td>
<td><strong>16.5</strong></td>
<td><strong>16/17</strong></td>
<td><strong>17.5</strong></td>
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* Schedule a minimum of 14 credits if taking accelerated Linear Alg/Diff Eq MA2321/3521

**Recommended HASS elective:** ECE3400

Choose at least 6 credits of 3000-4999 HASS

**Total 128**

**Plus 3 units co-curricular activities**

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**Undergraduate advisor:**
EERC 131. Call 487-2550 to schedule appt. eceadvise@mtu.edu

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**Notes:**
- Take CH1100 first if not well-prepared for UChem.
- MA2321/3521 full semester courses, may replace MA2321 and MA3521. Delays EE2112 (1 sem.).
- CH1153 is optional recitation section & is recommended. May use in approved or free electives.
- **Photonics electives:** fall: EE4252, PH4510 spring: EE4253, EE4290, MSE4292, BE4250-Alt spg even
- **1) 2) 4) 5)** See reverse side for planning info and General Education worksheet.
Choose correct courses each semester. Run and review your online Degree Audit each time you add, drop or switch courses and **before** each semester begins. Lists of electives and required courses are included in your online degree audit report. It is **your responsibility** to choose correct courses.

1) **Choose one course from each list for General Education requirements:** ALWAYS check for allowable course choices in your degree audit after registration adds and changes!

- **Critical & Creative Thinking list:** FA2330, FA2520, FA2720, FA2820, HU2130, HU2324, HU2501, HU2503, HU2538, HU2700, HU2820, HU2910, SS2300, TA2XX4

- **Social responsibility & Ethical Reasoning list:** EC2001, ED2000, PSY2000, SS2100, SS2200, SS2400, SS2500, SS2501, SS2502, SS2503, SS2504, SS2505, SS2600, SS2610, SS2700, TA2XX8

- **HASS lists:** at least 6 credits must be upper-level 3000-4999. UN1015 and UN1025 must be complete before taking upper-level HASS courses.

- **HASS Composition/Communication:** HU2810, HU2830, HU3015, HU3120, HU3151, HU3693, HU3694, HU3820, HU4628, HU1XX5, HU2XX5, HU3XX5, HU4XX5

- **HASS Social and Behavioral Science (EC/PSY/SS) choice:** ___________

- **HASS Humanities and Fine Arts (HU/FA) choice:** _____________ Upper level if needed.

- **HASS any list:** _______________ Upper level if needed.

2) **SELECT Approved Elective course list:** choose one course

- EE/EET3373, ENG2120, ENG3200, ENG4510, MEEM2110, MEEM2150, MEEM2201, MEEM2700, MSE2100, MSE4292, PH2300, PH2400, PH3300 (SELECT approved elective not required for biomedical or environmental applications concentrations)

3) **Remaining Approved Electives:** refer to your degree audit for list of valid courses. Ex: Engineering, Math, CS, Physics, Chem. Pass/fail courses do not count.

4) **EE Electives:** 15 credits (3-12 credits, varies w/ concentration) of EE lecture/lab coursework. Excludes research, pass/fail, project, co-op, or independent study credits. The purpose is to add skills and knowledge in new ECE topics, or more in-depth knowledge in an ECE area of specialization. May use for "Focus Area(s)". Look for semester offerings in the online Schedule of Classes. Look for pre-requisite and other course information by clicking the CRN, or in the online Course Descriptions.

EE elective courses are offered once per year, or in alternating years (ex. EE4240, EE5223, EE5250). Check online Course Descriptions and the Schedule of Classes for the most up-to-date course information and semester offerings.

5) **Engineering Design Requirements:** 4 – 6 credits

- **Option 1:** “Senior Design”, 4 credits, is the year-long company sponsored project team. EE4901(2) and EE4910(2) (or BE4901/BE4910) taken in fall-spring, or MEEM4901(2) and MEEM4911(2) taken in spring-fall or fall-spring. May use EPS-European Project Semester for Design Option 1, which includes EE3901 credit.

- **Option 2:** “Enterprise” – 6 credits, 4 semesters of project work beginning at the point in time when you have 4 semesters left on campus: ENT3950(1), ENT3960(1), ENT4950(2) and ENT4960(2). Reduces “Approved Electives” by 2 credits if applicable.

6) **Free Elective:** a good use of Free Elective: CH1153, MA1161 5th credit, Enterprise 2000-level project work, or excess transfer credits. Cannot use co-curricular activities.

**Concentration Electives:** See your Degree Audit Report in Banweb for list of valid electives with a concentration, or see the Degree Services .pdf audit for the BSEE with the concentration(s) you are interested in: [http://www.mtu.edu/registrar/students/major-degree/audit/engineering/](http://www.mtu.edu/registrar/students/major-degree/audit/engineering/) A concentration is not required.

Concentrations: Biomedical Applications, Electric Power Engineering, Enterprise, Environmental Applications, Photonics

- **GRADUATION:** Review degree audit for meeting all graduation requirements. Apply for graduation one semester before your last; DATE: _____________________. Schedule last semester courses, **review degree audit**, then meet with the advisor to review your last set of scheduled courses **before** your last semester begins.