### COMPUTER ENGINEERING DEPARTMENTAL ELECTIVES LIST

#### 2021 - 2022

*Successful completion of all prerequisite courses required as well as a minimum 2.5 TTU GPA.*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisite Courses</th>
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</thead>
<tbody>
<tr>
<td>ECE 3306</td>
<td>Electric Circuits II (ECE 3303)</td>
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<tr>
<td>ECE 3312</td>
<td>Electronics II (ECE 3311, ECE 3303 &amp; MATH 3350)</td>
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<tr>
<td>ECE 3323</td>
<td>Principles of Communication Systems (ECE 3303; MATH 3342 or IE 3341)</td>
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<tr>
<td>ECE 3342</td>
<td>Electromagnetic Theory II (ECE 3341 &amp; MATH 3351)</td>
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<tr>
<td>ECE 3353</td>
<td>Feedback Control Systems (ECE 3303 &amp; MATH 3350)</td>
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<tr>
<td><em>ECE 4310</em></td>
<td>Introduction to VLSI Design (ECE 3311)</td>
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<tr>
<td>ECE 4314</td>
<td>Solid State Devices (ECE 3311)</td>
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<tr>
<td>ECE 4316</td>
<td>Power Electronics (ECE 3311 &amp; ECE 3353)</td>
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<tr>
<td>ECE 4321</td>
<td>Applications of Analog Integrated Circuits (ECE 3312, ECE 3323, &amp; ECE 3353)</td>
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<tr>
<td>ECE 4323</td>
<td>Modern Communication Circuits (ECE 3312 &amp; ECE 3323)</td>
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<tr>
<td><em>ECE 4325</em></td>
<td>Telecommunication Networks (ECE 3304 or ECE 3323)</td>
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<tr>
<td>ECE 4331</td>
<td>Individual Studies in Electrical Engineering (instructor consent) (may NOT be repeated for credit)</td>
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<tr>
<td>ECE 4332</td>
<td>Topics in Electrical Engineering (may be repeated for credit)</td>
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<tr>
<td>ECE 4340</td>
<td>Power System Analysis (ECE 3306)</td>
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<tr>
<td>ECE 4341</td>
<td>Microwave Engineering (ECE 3342)</td>
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<tr>
<td>ECE 4342</td>
<td>Microwave Solid-State Circuits (ECE 3312)</td>
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<tr>
<td>ECE 4343</td>
<td>Introduction to Power Systems (ECE 3341)</td>
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<td>ECE 4344</td>
<td>Antennas and Radiating Systems (ECE 3342)</td>
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<td>ECE 4349</td>
<td>Modern Radar Circuits and Systems (ECE 3341)</td>
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<tr>
<td>ECE 4354</td>
<td>Power Semiconductor Devices (ECE 4314)</td>
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<tr>
<td>ECE 4360</td>
<td>Fiber Optic Systems (ECE 3341)</td>
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<tr>
<td>ECE 4362</td>
<td>Modern Optics for Engineering (ECE 3411)</td>
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<tr>
<td><em>ECE 4363</em></td>
<td>Pattern Recognition (MATH 3342, MATH 3350, ECE 3303, &amp; ECE 3304 or ECE 3323)</td>
<td>(TTU GPA &gt;=3.0; B or better in ECE 3303, MATH 3342, &amp; MATH 3350)</td>
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<tr>
<td><em>ECE 4364</em></td>
<td>Digital Signal Processing (ECE 3304)</td>
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<td><em>ECE 4365</em></td>
<td>Parametric and Functional Device Testing (ECE 3332 &amp; MATH 3342 or IE 3341)</td>
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<td><em>ECE 4366</em></td>
<td>Testing of Digital Systems (ECE 3332 &amp; MATH 3342 or IE 3341)</td>
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<td><em>ECE 4367</em></td>
<td>Image Processing (MATH 3342, MATH 3350, ECE 3303 &amp; ECE 3304 or ECE 3323)</td>
<td>(TTU GPA &gt;=3.0; B or better in ECE 3303, MATH 3342, &amp; MATH 3350)</td>
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<tr>
<td><em>ECE 4369</em></td>
<td>Security of Industrial Control Systems (ECE 3353)</td>
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<tr>
<td><em>ECE 4370</em></td>
<td>Machine Learning (MATH 2360, MATH 3342 or IE 3341, &amp; MATH 3350)</td>
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<tr>
<td>ECE 4377</td>
<td>Technology Startup Laboratory (ECE 3333 or ECE 3334)</td>
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<td>ECE 4378</td>
<td>Solar Energy (ECE 3333 or ECE 3334)</td>
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<tr>
<td><em>ECE 4380</em></td>
<td>Embedded Systems (ECE 3362 or CS 2350 &amp; ECE 3304 or ECE 3323)</td>
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<tr>
<td>ECE 4381</td>
<td>VLSI Processing (ECE 3311, PHYS 2401 &amp; MATH 3350)</td>
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<td><em>ECE 4382</em></td>
<td>Digital IC Analysis and Design (ECE 3311 &amp; ECE 3362)</td>
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<tr>
<td>ECE 4385</td>
<td>Introduction to Microsystems I (ECE 3303 &amp; ECE 3311)</td>
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<tr>
<td>ECE 4386</td>
<td>Introduction to Microsystems II (ECE 4385)</td>
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<tr>
<td>ECE 4391</td>
<td>Electric Machines and Drives (ECE 3341)</td>
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* - Approved ECE/CS short electives list

05.05.21 jmm
COMPUTER SCIENCE DEPARTMENTAL ELECTIVES LIST
2021 - 2022

Successful completion of all prerequisite courses required.

CS 3352 – Introduction to Systems Programming (CS 2350 or ECE 3362 & CS 2413)
*CS 3361 – Concepts of Programming Languages (CS 2413)
*CS 3364 – Design and Analysis of Algorithms (CS 1382, CS 2413, & MATH 2360)
*CS 3365 – Software Engineering I (CS 2365 or CS 2413 & MATH 3342 or equivalent)
CS 3366 – Human Computer Interaction (CS 2413)
*CS 3368 – Introduction to Artificial Intelligence (CS 1382)
CS 3375 – Computer Architecture (CS 2350 or ECE 3362)
*CS 3383 – Theory of Automata (CS 1382)
CS 4000 – Individual Studies in Computer Science (V1-6) (advanced standing/departmental approval) (may be repeated for credit)
CS 4328 – Scientific Computing (CS 2413 & MATH 1452)
CS 4331 – Special Topics in Computer Science (CS 3375) (advanced standing and CS 3375)
*CS 4352 – Operating Systems (CS 3364 & CS 3375)
*CS 4354 – Concepts of Database Systems (CS 3364)
*CS 4365 – Software Engineering II (CS 3365) (NO LONGER OFFERED PER CS ADVISOR 04/2021)
CS 4379 – Parallel and Concurrent Programming (CS 3364 & CS 3375)
CS 4380 – Embedded Systems
CS 4391 – Special Topics in AI (senior standing)
CS 4392 – Computer Networks (CS 2413)
*CS 4395 – Introduction to Computer Graphics (CS 3364)
CS 4397 – Computer Game Design and Development (CS 3364)
CS 4398 – Theory and Practice of Logic Programming (CS 1382 & CS 2413)

MATHEMATICS DEPARTMENTAL ELECTIVES LIST
2020 – 2021

Successful completion of all prerequisite courses required.

MATH 4310 – Introduction to Numerical Analysis I (MATH 3350 or MATH 3354)
MATH 4330 – Mathematical Computing (consent of undergraduate program director – please email Mathematics Undergraduate Advisor directly @ patty.schovanec@ttu.edu)