

FALL SCHEDULE		
WEEK	LECTURE	LABORATORY
<b>1</b> Sep 6 Sep 12	<p>Introduction to COE 538</p> <p>Scope and objectives Management</p> <p><b>INTRODUCTION TO THE HCS12 <math>\mu</math>-CONTROLLER</b></p> <ul style="list-style-type: none"> <li>- 1.3 Computer Hardware Organization.....2-7</li> <li>- 1.5 Memory system Operation.....10-12</li> <li>- 1.6 Program Execution.....12-21</li> <li>- 1.8 The HCS12 CPU Registers.....22-24</li> <li>- 1.9 HCS12 Addressing Modes.....24-29</li> <li>- 1.11 A Sample of HCS12 Instructions.....29-34</li> </ul> <p><b>HCS12 ASSEMBLY PROGRAMMING</b></p> <ul style="list-style-type: none"> <li>- 2.2 Assembly Language Program Structure.....40-41</li> <li>- 2.3 Assembly Directives.....42-44</li> </ul>	
<b>2</b> Sep 13 Sep 19	<p><b>HCS12 ASSEMBLY PROGRAMMING</b></p> <ul style="list-style-type: none"> <li>- 2.5 Writing Programs to Do Arithmetic.....47-57, 59-60</li> <li>- 2.6 Program Loops.....63-72</li> <li>- 2.7 Shift and Rotate Instructions.....72-79</li> <li>- 2.8 Boolean Logic Instructions.....79-80</li> <li>- 2.9 Bit Test and Manipulate Instruction.....80-81</li> <li>- 2.10 Program Execution Time.....81-83</li> </ul> <p><b>HW/SW DEVELOPMENT TOOLS FOR HCS12</b></p> <ul style="list-style-type: none"> <li>- 3.2 Development Tools for the HCS12.....88-90</li> <li>- 3.8 Using CodeWarrior.....123-137</li> </ul> <p><b>ADVANCED ASSEMBLY PROGRAMMING</b></p> <ul style="list-style-type: none"> <li>- 4.10 Intro to Parallel I/O Port &amp; Devices.....185-188</li> <li>- 4.11 Simple I/O Devices.....188-196</li> </ul>	<p><b>Lab 1</b></p> <p>Using the CodeWarrior IDE and Introduction to Assembly Programming</p>
<b>3</b> Sep 20 Sep 26	<p><b>ADVANCED ASSEMBLY PROGRAMMING</b></p> <ul style="list-style-type: none"> <li>- 4.3 Stack.....146-148</li> <li>- 4.4 What Is a Subroutine.....148-151</li> <li>- 4.5 Issues related to Subroutine Calls.....151-153</li> <li>- 4.6 The Stack Frame.....153-154</li> <li>- 4.9 Subroutines for Creating Time Delay.....184-185</li> </ul> <p><b>ADVANCED PARALLEL I/O</b></p> <ul style="list-style-type: none"> <li>- 7.5 The HCS12 Parallel Ports.....305-317</li> <li>- 7.7 Liquid Crystal Displays (LCDs).....322-323</li> <li>- 7.8 The HD4478U LCD Controller.....323-336</li> <li>- 7.9 Interfacing Parallel Ports to a Keypad.....338-343</li> </ul>	<p><b>Lab 2</b></p> <p>Programming the I/O Devices</p>

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<b>4</b> Sep 27 Oct 3	<b>INTERRUPTS</b> - 6.2 Fundamental Concepts of Interrupts..... 262-266 <b>ANALOG-TO-DIGITAL CONVERTER</b> - 12.2 Basics of A/D Conversion..... 592-598 - 12.3 The HCS12 A/D Converter.....598-607 - 12.4 The Functioning of the ATD Module..... 607-610 - 12.5 Procedure for Performing A/D Conversion. 611-614	---“---
<b>5</b> Oct 4 Oct 10	<b>INTERRUPTS, CLOCK GENERATION, AND OPERATION MODES</b> - 6.3 Resets..... 266-267 - 6.4 HCS12 Exceptions..... 267-271, 273-274 - 6.6 Clock and Reset Generation Block..... 277-286 - 6.7 Real-Time Interrupt..... 287-289, 294 - 6.11 HCS12 Operation Modes..... 295-296 <b>TIMER FUNCTIONS</b> - 8.3 Standard Timer Module..... 365-366 - 8.4 Timer Counter Register..... 366-368 (Thanksgiving, Monday, Oct. 11, University closed)	<b>Lab 3</b> Battery and Bumper Displays
<b>6</b> Oct 11 Oct 17	<b>TIMER FUNCTIONS</b> - 8.5 Input-Capture Function..... 368-370, 372-376 - 8.6 Output-Compare Function..... 377-385, 393-396 - 8.7 Pulse Accumulator..... 396-407 - 8.8 Modulus Down Counter..... 407-410	---“---
<b>7</b> Oct 18 Oct 24	<b>MIDTERM</b> Covers material up to end of week 5 (excluding chapter 8)	<b>Lab 4</b> Motor Control & Using the Hardware Timer
<b>8</b> Oct 25 Oct 31	<b>C LANGUAGE PROGRAMMING</b> - 5.3 Types, Operators, and Expressions..... 207-211 - 5.4 Control Flow..... 211-214 - 5.5 Input and Output..... 215-216 - 5.6 Functions and Program Structure..... 216-219 - 5.7 Pointers, Arrays, Structures, and Unions..... 219-224 - 5.8 Writing C Programs to Perform Simple I/O... 224-227 - 5.11 Using the CodeWarrior to Develop C Progr.231-243	<b>Lab 5</b> Robot Roaming Program

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<b>9</b> Nov 1 Nov 7	<b>SERIAL COMMUNICATION INTERFACE</b> - 9.3 The RS-232 Standard.....451-452 - 9.4 The HCS12 SCI..... 453-454 - 9.5 SCI Baud Rate Generation..... 454-455 - 9.6 The SCI Operation..... 455-460 - 9.9 Interfacing SCI with TIA-232..... 464-469	---“---
<b>10</b> Nov 8 Nov 14	<b>THE SPI FUNCTION</b> - 10.2 Introduction to the SPI Function..... 474-475 - 10.3 Registers Related to the SPI Subsystem..... 475-478 - 10.4 SPI Operation..... 478-480 - 10.5 SPI circuit connection..... 482-484 - 10.6 Configuration / Data Transfer in SPI..... 484-486 - 10.8 The 74HC595 Shift Register..... 487-489	<b>Project</b> Robot Guidance Challenge
<b>11</b> Nov 15 Nov 21	<b>INTER-INTEGRATED CICUIT (I<sup>2</sup>C) INTERFACE</b> - 11.2 The I <sup>2</sup> C Protocol..... 530-541 - 11.3 An Overview of the HCS12 I <sup>2</sup> C Module..... 541-542 - 11.4 Registers for I <sup>2</sup> C Operation..... 542-549 - 11.5 Programming the I <sup>2</sup> C Module..... 549-552	---“---
<b>12</b> Nov 22 Nov 28	<b>INTERNAL MEMORY CONFIGURATION AND EX- TERNAL EXPANSION</b> - 14.3 Internal Resource Remapping..... 694-699 - 14.4 Expanded Memory Mapping..... 699-701 - 14.7 HCS12 External Memory Interface..... 725-736 - 14.9 Memory Devices.....736-744 - 14.10 Example of External Memory Expansion... 744-751	---“---
<b>13</b> Nov 29 Dec 5	<b>REVIEW AND CATCH-UP</b>	<b>Project</b> Submission
<b>14 - 15</b> Dec 6 Dec19	<b>FINAL EXAMINATION</b>	Covers material up to end of week 12