

2018-2019
M.Tech. ESS (2nd Semester)
COURSE TITLE: CPLD and FPGA Lab
COURSE CODE: ESS – 208

S.No.	EXPERIMENT	DEMONSTRATOR
1.	Designing half adder by structure using FPGA.	<i>Dr. Faisal Bashir</i>
2.	Designing full adder by structure using FPGA.	
3.	Designing full adder by dataflow using FPGA.	
4.	Designing (2-bit) multiplier by dataflow using FPGA.	
5.	2 X 4 decoder with case using FPGA.	
6.	1- Bit comparator using FPGA.	
7.	Designing 4-bit comparator by dataflow using FPGA.	
9.	Designing 4:1 multiplexer by structure using FPGA.	
10.	Designing multiplexer by dataflow.	
11.	Designing multiplexer using “Case” statements.	
12.	Designing multiplexer using “When Else” statement.	
13.	Designing multiplexer using “with select when” statement using FPGA.	
14.	Designing SR flip flop using case using FPGA.	
15.	Designing binary to decimal converter using FPGA.	
16.	Designing decimal to binary converter using FPGA.	
17.	Designing binary to gray converter using FPGA.	
18.	Factorial using while loop.	
19.	Designing synchronous counter using FPGA.	
20.	Designing 4 – Bit ALU using “Case” statement using FPGA	

M.Tech. ESS (2nd Semester)
COURSE TITLE: ARM CORTEX and Microcontroller Lab
COURSE CODE: ESS – 207L

S.No	EXPERIMENT	DEMONSTRATOR
1	16-Bit Data Transfer	
2	32-Bit Data Transfer	
3	One's Complement Of A Number	
4	16-Bit Addition / 32-Bit Addition	
5	Left Shift (1-Bit)	
6	Left Shift (1-Bit) Alternate Method	
7	Larger Of Two Numbers	
8	64-Bit Addition	
9	Lookup The Factorial From A Table Using The Address Of The Memory Location	
10	Add A Series Of 16-Bit Numbers	
11	Add A Series Of 32-Bit Numbers	
12	Add A Series Of 16-Bit Numbers By Using A Table Address Look-Up	
13	Count Negative Numbers In A Series Of 32-Bit Numbers	
14	Find Largest Unsigned 32-Bit Value In A Table	
15	Normalize A Binary Number	
16	Convert A 32-Bit Hexadecimal Number To An ASCII String	
17	Convert A Decimal Number To Seven Segment Binary	
18	Convert An ASCII Numeric Character To Decimal	
19	Convert An Unpacked BCD Number To Binary	
20	Convert An Unpacked BCD Number To Binary Using MUL	
21	16-Bit Binary Multiplication	
22	Multiply Two 32-Bit Number To Give A 64-Bit Result	
23	Divide A 32-Bit Binary Number By A 16-Bit Binary Number	
24	Binary Coded Decimal To Binary -Convert An Unpacked BCD Number To Binary	
25	64-Bit Data Transfer	
26	32-Bit Subtraction	
27	Half-Word Assembly	
28	Shift Right Three Bits	
29	Find The Smallest Of Three Numbers	
30	Shift Left N Bits	
31	Checksum Of Data	
32	Number Of Zero, Positive And Negative Numbers In A Series Of Signed 32-Bit Numbers.	
33	Find Minimum (Smallest) Element In A Series Of Unsigned Bytes	
34	Decimal To ASCII Conversion	
35	Binary To Binary-Coded-Decimal Conversion	
36	Packed Binary-Coded-Decimal To Binary String Conversion	
37	Decimal Subtraction: Subtract One Packed Decimal (BCD) Number From Another.	
38	32-Bit By 32-Bit Multiply	
39	Initiate A Simple Stack	
40	A Simple Subroutine Example Program Passes A Variable To The Routine In A Register	
41	A More Complex Subroutine Example Program Passes Variables To The Routine Using The Stack	
42	A 64-Bit Addition Subroutine	
43	A Subroutine To Find The Factorial Of A Number	
44	Compute The Sum Of Digits In A Given Integer	
45	Convert A Decimal Number To Binary & Count The Number Of 1s	
46	Convert Binary To Hexadecimal	
47	Convert Decimal To Octal	

Dr. Javeed Iqbal Reshi

Dr. M. Tariq Bandy

Dr. Javeed Iqbal Reshi

48	Convert Decimal To Hexadecimal	<i>Dr. Javeed Iqbal Reshi</i>
49	Convert Octal To Binary	
50	Convert Hexadecimal To Binary	<i>Dr. M. Tariq Bandy</i>
51	Find Sum Of Digits Of A Number	
52	Find Reverse Of A Number	
53	Find Sum Of N Numbers	
54	Find Whether A Number Is Prime Or Not	
55	Print Binary Equivalent Of An Integer	
56	Reverse A Given Number	
57	Reverse A Number & Check If It Is A Palindrome	
58	Find The Sum Of Two Binary Numbers	
59	Find Multiplication Of Two Binary Numbers	
60	Generate Fibonacci Series Of N Numbers Using Command-Line Arguments	
61	Find The Sum Of First 50 Natural Numbers Using For Loop	
62	Calculate Sum Of All Elements Of An Array	
63	Find The Largest Number In An Array	
64	Put Even And Odd Elements Of An Array In 2 Separate Arrays	
65	Insert An Element In A Specified Position In A Given Array	
66	Delete The Specified Integer From An Array	
67	Search For An Element	
68	Search Using Binary Search	
69	Find The Biggest/Smallest Number In An Array Of Numbers	
70	Print The Number Of Odd & Even Numbers In An Array	
71	Print All The Repeated Numbers With Frequency In An Array	
72	Print The Kth Element In An Array	
73	Calculate The Mean, Variance & Standard Deviation	
74	Print The Factorial Of A Given Number	
75	Generate The Following Standard Sequence In C Programs: I. Unit Step II. Impulse III. Unit Ramp	<i>Dr. Javeed Iqbal Reshi</i>
76	Compute Power Density Spectrum Of The Standard Sequences (Unit Step, Impulse, Unit Ramp)	
77	Linear Convolution Implementation In C Programming	
78	Circular Convolution Implementation In C Programming	
79	Noise Reduction Using Correlation And Auto-Correlation	
80	Frequency Response Of Analog Filters Through A C Program	
81	FIR Filter Implementation In C Programming	
82	IIR Filter Implementation In C Programming	
83	Loading MSD Bootloader & MSD Flash Programming Application (PE Micro Debugger)	<i>Dr. M. Tariq Bandy</i>
84	Loading MSD Bootloader & MSD Flash Programming Application (mbed)	
85	Program To Make LEDs Connected On FRDM-KL25Z Board With ARM Microprocessor, On And Off	
86	Learn To Update Firmware And Download Applications Into MSD Bootloader And MSD Flash Of FRDM KL25Z	
87	Learn To Write Simple Program For FRDM KL25Z And Download To The Board Through KEIL UVISION And Debug Programs On For FRDM KL245Z	
88	Learn To Use mbed And Write Sample Program Using mbed For FRDM KL25Z	
89	Write A Program For GPIO (General Purpose I/O) Programming And Interfacing (Different GPIOs) Using KEIL UVISION And Design Circuit For FRDM KL25Z	
90	Write A Program For Seven-Segment LED Interfacing And Programming Using KEIL UVISION And Design Circuit For FRDM KL25Z	

91	Write A Program For LCD And Keyboard Interfacing Using KEIL UVISION And Design Circuit For FRDM KL25Z	Dr. M. Tariq Banday
92	Write A Program For UART Serial Port Programming Using KEIL UVISION And Design Circuit For FRDM KL25Z	
93	Write A Program For Freescale ARM Timer Programming Using KEIL UVISION And Design Circuit For FRDM KL25Z	
94	Write A Program For Interrupt And Exception Programming Using KEIL UVISION And Design Circuit For FRDM KL25Z	
95	Write A Program For ADC, DAC And Sensor Interfacing Using KEIL UVISION And Design Circuit For FRDM KL25Z	Dr. Javeed Iqbal Reshi
96	Write A Program For SPI Protocol And Devices Using KEIL UVISION And Design Circuit For FRDM KL25Z	
97	Write A Program For I2C Protocol And RTC Interfacing Using KEIL UVISION And Design Circuit For FRDM KL25Z	
98	Write A Program For Relay, OPTO-Isolator And Stepper Motor Interfacing Using KEIL UVISION And Design Circuit For FRDM KL25Z	
99	Write A Program For PWM And DC Motor Control Using KEIL UVISION And Design Circuit For FRDM KL25Z	Dr. M. Tariq Banday
100	Write A Program For Programming Graphic LCD Using KEIL UVISION And Design Circuit For FRDM KL25Z	
101	Blink An LED	
102	Buttons And PWM: Use 3 Pushbuttons To Control The Colours In An RGB LED On LPC1768	
103	Graphic LCD: Connecting The Serial Miniature Graphics LCD To The mbed LPC1768 And Making Some Shapes And Text	Dr. Javeed Iqbal Reshi
104	Accelerometer: Use Of MMA8452Q 3-AXIS Accelerometer To Move A Ball Around The Screen.	
105	Internet Clock: To Hook Up An Ethernet Jack To mbed To Get It On The Internet And Use Of Network Time Protocol(NTP) To Fetch The Current Time And Display It On The LCD	
106	USB Host And Threading: Turning The mbed LPC1768 Into A USB Host And To Display The Characters From A USB Keyboard	
107	USB Device: Using A USB Mini-B Breakout And Some Buttons, Enumerate The mbed As A USB Mouse And Control The Computer's Pointer With The Buttons	Dr. M. Tariq Banday
108	Temperature Logging: Using The mbed LPC1768, Take Measurements From A Temperature Sensor, Log The Data To A Micro SD Card And Print Out The Contents Of The SD Card To A Console.	
109	PWM Sounds: Connect The Headphone Jack To The mbed And Control The PWM Pins To Create Basic Sounds.	
110	Hardware Soundboard: To Make Hardware Soundboard Using mbed; Store Some .wzv Files On An SD Card And Play One Whenever A Button Is Pressed.	