

1. Determine your project-specific requirements	3. Look up specifications in the PIC datasheet		
Design Considerations	PIC Option 1	PIC Option 2	PIC Option 3
How many GPIO Pins? ¹	12/8	53/8	33/8
Built-in Analog to Digital Converter? How many?	11/2	35/2	12/2
Built-in Hardware PWM? How many?	2/2	2/2	/2
Built-in I2C? SPI? How many?	spi	2 I2C/spi	spi
Built-in UART? How many?	1/2	2/2	/2
Other Required Built-In Features? <i>(optional)</i>		4 16 bit Timers	
Additional considerations specific to your project specifications <i>(optional)</i>			
2. Find 3 microcontrollers that meet your team project-specific requirements and find information on each	4. Look up part details in the PIC datasheet		
Microcontroller Considerations	PIC Option 1	PIC Option 2	PIC Option 3
Part Number ²	PIC16F18325T-I/SL	PIC18F47Q10-I/PT	ATMEGA808-AUR
Link (URL) to product page	Link	Link	LINK
Links (URL) to Data Sheets	Link	Link	LINK

¹ No PIC16F887, PIC16F917, PIC18F47Q10, or dsPICs allowed

² General Purpose Input/Output Pins - calculate based on your block diagram and include at least 20% more than you need. Avoid using In-System Programming (ISP) pins for GPIO.

Links (URL) to Application Notes		Link	
Links (URL) to Code Examples		Link	
Links (URL) to External Resources		Link	
Production Unit Cost	\$1.27	\$1.94	\$1.24
Supply Voltage Range	2.3V to 5.5V	1.7V to 5.5V	-0.5V to 5V
Absolute Maximum Current for entire IC		5.7 mA	200mA
Maximum GPIO Pin Current (Source/Sink)		200 µA	40mA
8-bit or 16-bit Architecture	16 bit	8-bit	8-bit
Available IC Packages / Footprints	Surface Mount	Surface Mount	Surface Mount
Supports External Interrupts?	Yes	Yes	Yes
In-System Programming Capability and Type	C	Yes, C	C
Programming Hardware, Cost, and URL		MPLAB® PICKit™ 5 in-circuit debugger/program me \$94.99 Link	
Works with MPLAB® X Integrated Development Environment (IDE)?	Yes	Yes	Yes
Works with Microchip Code Configurator ?		Yes	

5. Write overall pros, cons, and rankings for the chosen microcontrollers				
Overall Pros	<i>Write at least 2 for each microcontroller</i>	<ul style="list-style-type: none"> • Smaller/ easy to solder • Less application tools 	<ul style="list-style-type: none"> • Familiarity • Plenty of GPIO Pins 	<ul style="list-style-type: none"> • Functionality • Similar to class
Overall Cons	<i>Write at least 2 for each microcontroller</i>	<ul style="list-style-type: none"> • Less GPIO pins to work with • Minimal datasheet 	<ul style="list-style-type: none"> • Low Operating Voltage Range • Difficult Assembly 	<ul style="list-style-type: none"> • Could be hard to find information • Lower in stock
Ranking	<i>1 = first, 2 = second, 3 = third</i>	2	1	3

6. Final Microcontroller Choice: PIC18F47Q10-I/PT

Rationale: Because it's familiar to the class, we can work it in more seamlessly into our design without a lot of modification to our subsystem designs.