



Nixie Clock

	Poland 	Slovakia 
Suitable for grade:	3 - 4	3 - 4
Specialization:	Mechatronics or IT	Electrotechnics
Responsible teacher:		Ingrid Kolembusová

<p>Project description: Goal of the project is to construct nixie clock, or nixie tube (you can find picture on the internet) that will display the time in the form of HH MM SS and additional information like date, thermometer, alarm, etc. Clock will be driven by microcontroller with real-time clock modul (RTC). Whole project will be divided into two parts - display and control.</p> <p>Format of displayed data:</p> <ul style="list-style-type: none"> - time HH MM SS, - date dd mm yy, - temp TT (the last two digits) <p>You can use:</p> <ul style="list-style-type: none"> - time (PCF8583 + DS32kHz) - temp (DS18B20) 	
<p>Project tasks:</p> <p>Student #1 (PL):</p> <ul style="list-style-type: none"> - Prepare program for microcontroller to: <ul style="list-style-type: none"> o realize a 24-hour clock and other function based on agreement with teacher o cyclic display function - for example - time for 5 seconds, date 3 seconds and temperature for 2 seconds o switches of control o 6 outputs for multiplexing of tubes (digits of clock) o BCD signal (4 bits) decoding o RTC operation on the battery in the absence of power - Prepare circuit to send output to display module made by student #2 - Design and make PCB based on circuit - Test displaying time <p>Student #2 (SK):</p> <ul style="list-style-type: none"> - Design and make case (panel) of nixie clock - Design and make PCB for connecting lights to power source - All outputs and inputs must be separated - Power supply - Test displaying time - Interconnect lights PCB with outputs of microcontroller 	
<p>Success criteria: Project will be successful after construction of working nixie clock with displayed time and at least one other data (based on agreement with teacher). All project parts should be cost efficient and computer code should be well designed (time and memory efficient, without bugs). Project documentation has to be prepared based on given template in the range of 15-25 in English and native language.</p>	



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Developed hard skills:

Programming, debugging, soldering, drilling, designing and making PCB, electronics, working with vacuum components, electronic measurement, working with datasheets, mechanical treatment of materials, choosing materials, computer graphics, CAD systems

Developed soft skills:

Cooperation, working with computer, planning, teamwork, tracking progress, communication in foreign language, responsibility, compliance with agreements, respect deadlines, problem solving, finding and processing information, design thinking, following safety and ergonomic rules