

**Design and Technology**  
**F.1 TEACHING SYLLABUS (2016-2017)**

**1<sup>st</sup> term**

**Topic (1) : Design <123>**

**Computer aided design**

Week	Content	Activity	Assignment or Assessment
<b>(1) Introduction, Design &lt;123&gt;:</b> ✧ <b>Sketching 2D figures</b>	Subject introduction	Lecture	Assignment: ✧ Install design <123> ✧ HW: Sketching 2D Figures with dimension
	Project introduction		
✧ <b>Sketching 2D figures</b>	Introduce Design <123>	Lecture & practice	
	User interface of Design <123>: Viewing tools		
	2D sketching: ✧ Basic drawing tools: Primitives ✧ Dimensioning ✧ Editing dimensions		
<b>(2) Design &lt;123&gt;:</b> ✧ <b>Modify 2D figures</b>	<u>2D sketching:</u> ✧ Sketches: Polyline, Spline, Arc ✧ Modifying tools: Fillet, Trim, Extend, Offset	Lecture & practice	Assignment: ✧ HW: Logo Design
<b>(3) Design &lt;123&gt;:</b> ✧ <b>Construct 3D figures</b>	<u>3D sketching:</u> ✧ Use Primitives ✧ Positioning of 3D figures ✧ Combining 3D figures ✧ Transformation: Move/Rotate, Align, Smart Scale	Lecture & practice	Assignment: ✧ Lego character Design (head)
<b>(4) Design &lt;123&gt;:</b> ✧ <b>Construct 3D figures</b>	<u>3D sketching:</u> ✧ Form 2D to 3D Extrude, Sweep, Revolve, Loft ✧ Modifying 3D figures Press Pull, Tweak, Split face, Fillet, Chamfer, Shell ✧ Materials	Lecture & practice	Assignment: ✧ Lego character Design (body)
<b>(5) Design Project</b>	Design Activity	Practical work	Assessment: ✧ Lego character Design

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**Topic (2) : 3D Printing**

**CAD and CAM**

<b>Week</b>	<b>Content</b>	<b>Activity</b>	<b>Assignment or Assessment</b>
<b>(6) 3D Printing Process &amp; Graphic presentation</b>	<u>3D printing:</u> ✧ Export 3D figures ✧ User interface of 3D printing ✧ Manipulation of 3D printing <u>Graphic Presentation</u> ✧ Orthographic views ✧ Isometric views ✧ Sectional views	Practical work	Assignment: ✧ Graphic Presentation
<b>(7) 3D Printing Process &amp; Graphic presentation</b>	<u>3D printing &amp; Graphic Presentation:</u> ✧ Lego character Design	Workshop realization	Assessment: Lego character Design ✧ Product ✧ Graphic presentation

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**Topic (3) : mBot**

**Robotics**

<b>Week</b>	<b>Content</b>	<b>Activity</b>	<b>Assignment or Assessment</b>
<b>(8) Basic of mBot</b> ✧ <b>Hardware assembly</b> ✧ <b>Control interface</b>	✧ Explore the different I/O function of robot ✧ Perform task by wireless control (blue booth)	Lecture & practice	Assignment: ✧ Software installation ✧ Hardware assembly
<b>(9) Building personal mBot</b>	✧ Build personal mBot with the use of 3D printer. ✧ Visualize the design idea by using CAD program	Lecture & practice	Assignment: ✧ mBot outlook design

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**Topic (4) : Key Chain Design**

**Production skills**

<b>Week</b>	<b>Content</b>	<b>Activity</b>	<b>Assignment or Assessment</b>
<b>(10) Manipulation of basic hand tools</b>	✧ Workshop safety in N405 ✧ Cutting skills of plastics	Workshop realization	✧
<b>(11) Manipulation of basic hand tools</b>	✧ Filing and finishing of plastics	Workshop realization	✧
<b>(12) Manipulation of Machine tools</b>	Drilling procedures: ✧ Powered hand drill ✧ Drill machine	Workshop realization	✧
<b>(13) Manipulation of Machine tools</b>	✧ Gluing ✧ Bending of plastics	Workshop realization	✧
<b>(14) Finishing of Design Artifact</b>	✧ Finishing of design work ✧ Project Evaluation	Workshop realization	✧

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**Topic (5) : Six-legs Robot Design**

<b>Week</b>	<b>Content</b>	<b>Activity</b>	<b>Assignment or Assessment</b>
<b>(1) Introduction</b>	<ul style="list-style-type: none"> <li>✧ Introduce design project</li> <li>✧ Requirements of design folio</li> <li>✧ Competition guidelines</li> <li>✧ Marking scheme</li> </ul>	Lecture	✧
<b>(2) Exploration of six-legs robot</b>	<ul style="list-style-type: none"> <li>✧ Kit-set robot assembly</li> </ul>	Workshop realization	Assessment: ✧ Assembly of robot
<b>(3) Exploration of six-legs robot</b>	<ul style="list-style-type: none"> <li>✧ Robotic Controlling method</li> <li>✧ Wire control</li> <li>✧ Wireless control (mBot interface)</li> </ul>	Workshop realization	Assessment: ✧ Assembly of robot
<b>(4) Design process</b>	<ul style="list-style-type: none"> <li>✧ Base design</li> <li>✧ Legs design</li> <li>✧ Outlook design</li> </ul>	Workshop realization	
<b>(5) Design process</b>	<ul style="list-style-type: none"> <li>✧ Working drawing</li> <li>✧ Assembly drawing</li> </ul>	Workshop realization	Assignment: ✧ Design folio
<b>(6) Design process: legs</b>	<ul style="list-style-type: none"> <li>✧ Legs design (CAD)</li> <li>✧ Production of the legs</li> </ul>	Workshop realization	✧
<b>(7) Design process: legs</b>	<ul style="list-style-type: none"> <li>✧ Production of the legs (3D-printing)</li> </ul>	Workshop realization	Assessment: ✧ Legs design

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<b>Week</b>	<b>Content</b>	<b>Activity</b>	<b>Assignment or Assessment</b>
<b>(8) Design process: base</b>	<ul style="list-style-type: none"> <li>✧ Base design (CAD)</li> <li>✧ Production of the base</li> </ul>	Workshop realization	
<b>(9) Design process: base</b>	<ul style="list-style-type: none"> <li>✧ Production of the base</li> </ul>	Workshop realization	Assessment: <ul style="list-style-type: none"> <li>✧ Base design and production</li> </ul>
<b>(10) Electronic components</b>	<ul style="list-style-type: none"> <li>✧ Understand the use of related electronic components</li> <li>✧ Connection of components</li> <li>✧ Electrical soldering skills</li> </ul>	Workshop realization	
<b>(11) Computer-controlled method</b>	<ul style="list-style-type: none"> <li>✧ Introduce &lt;Scratch&gt;</li> <li>✧ Design controlling program by using &lt;Scratch&gt;</li> </ul>	Workshop realization	
<b>(12) Design process: outlook design</b>	<ul style="list-style-type: none"> <li>✧ Production of the outlook design</li> </ul>	Workshop realization	Assessment: <ul style="list-style-type: none"> <li>✧ Outlook design and production</li> </ul>
<b>(13) Testing and modification</b>	<ul style="list-style-type: none"> <li>✧ Testing</li> <li>✧ Adjustment</li> <li>✧ Modification Of the design product</li> </ul>	Workshop realization	Assessment: <ul style="list-style-type: none"> <li>✧ Final product</li> </ul>
<b>(14) Competition &amp; evaluation</b>	<ul style="list-style-type: none"> <li>✧ Robotic competition</li> <li>✧ Course evaluation</li> </ul>	competition	Assessment: <ul style="list-style-type: none"> <li>✧ Function and performance</li> </ul>