

E U E R A S M U S V R / A R



TECHNICAL DRAWINGS

TD6: ASSEMBLY DRAWINGS

Authors

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Introduction

This module addresses the use of low cost mobile Virtual and Augmented Reality (V/AR) tools developed with the support of animation and simulation tools alongside text based teaching methods. This unit was produced by the results of an international needs analysis of Technical Drawings training requirements conducted to determine the subject areas lacking in teaching the concepts of basic, advanced standards and principles used in manufacturing and engineering.

The main purpose of this curriculum development study was to develop a competency-based and target-oriented Technical Drawings training programme with the collaboration with the academic and the industrial partners. That's is why it was concluded that not only current teaching methods have led to a deficit in the quality of Technical Drawings training but also using up to date V/AR and animation technologies could help to improve it.

It is envisaged that the use of V/AR technologies, which will help to gain skills for visual memory during these advanced studies, will make a significant contribution to the learning performance of the trainee.

How to Use

Use of Animations:

Users first watch related video or animation/visualization to understand basis of the subjects.

Use of AR apps: A virtual object would be superimposed over a live video feed from a camera of a mobile device. The use of ARCore can only work with new mobile phones that have (Android 7.0+).

Use of VR apps: The requirements for the student/teacher for VR apps would be: HTC VIVE Virtual Reality System or VR Glasses

These animation and A/VR applications can be found at the project web site and can be downloaded free.

<http://vrindesign.org/>

VRINDESIGN TECHNICAL DRAWINGS

Module Code: TD6

Module Title: ASSEMBLY DRAWINGS

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| <p>Course Content</p> | <p>Assembly Drawings</p> <p>What is an assembly drawing, how it is distinguished and where it is used. Types, features, layout and scales of the assembly drawing. Views, cross-sections and measurements in assembly drawings. Assembly drawings of perspective and schematically drawn systems. Balloon operations and part listing tables.</p> <p>Methods of distinguishing the structural characteristics of manufacturing and assembly drawings (manufacturing and assembly processes that are meant to be a step in the manufacture of the image in the assembly drawing). Display of sections, tolerances, control measures, surface roughness symbols and additional lists or tables according to need, as well as manufacturing methods and standards in the drawing paper. Preparing and reading title block in manufacturing drawings. Drawing demonstration techniques of fasteners and some special machine equipment (such as gears, springs, bolt-nut welded joints).</p> | |
| <p>Learning Outcomes</p> | <p>6.1</p> | <p>Learners</p> <p>Know the structural features of manufacturing drawing and can distinguish manufacturing and assembly drawings from basic information such as cross-sectional view, tolerance and surface marks.</p> |
| <p>6.2</p> | <p>Learners</p> | <p>Can prepare and read title blocks in manufacturing drawings. The joint elements and some special machine tools (such as gears, springs, bolts or welded joints) know the drawing techniques and can read their symbols or special markings (such as M12) on the technical drawings.</p> |
| <p>6.3</p> | <p>Learners</p> | <p>The numbering and numbering methods of the assembled parts (according to the assembly-by-part-manufacturing method). Recognize joining elements. Reads assembly and exploded parts from technical drawings.</p> |
| <p>Course hours</p> | <p>60 min</p> | |
| <p>V/AR Content</p> | <p>Video / Animation</p> <p>Mobile AR Application</p> <p>VR with HTC Vive app</p> | |

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| Teaching Learning Methods | <p>Teaching Methods for Trainers</p> <p>These applications and animations should be used as supporting materials during theoretical lecture to teach the course content. Suggested methods are:</p> <ul style="list-style-type: none">- Use general PowerPoint slides to teach theoretical content,- Use /show related video or animation where the related subject presentation to visualization can be shown,- Learners can use their own AR apps to create these subjects as 3D environment if possible,- Or use AR apps via projections to show the details to the learners,- Learners can use their own mobile device to see related VR apps to create these subjects as 3D environment via using VR glasses- Or trainers can use VR apps via HTC vive with the learners to understand related subject as 3D environment <p>Learning Methods for Individual Users</p> <ul style="list-style-type: none">- Firstly watch related video or animation / visualization and understand basis of the subjects.- Use your AR apps to create these subjects in 3D environment- Use your mobile device to see related VR apps to practice these subjects as 3D environment via using VR glasses |
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