DESP:2000 2021/22 - PROJECT 2

Parametric Virtual Prototype

PERSONAL EXO-SKELETAL ASSIST

MODELLING REQUIREMENTS

Form Modelling of the defined product form, which must remain reflective of the tutorial guided model and accommodate the key product features, functions and interactions
Technical Design requires a detailed modelling and specification of the structural & articulating components, detail of pivoting features.

CAD MODELLING OUTPUTS

A full digital prototype is required, which will include a detailed proposition of all ASSEMBLY COMPONENTS, SUB-ASSEMBLY OF GEAR TRAIN, SUB-ASSEMBLY, SUMARY ASSEMBLY

General Assembly and Sub-Assembly arrays will be modelled in full detail.
In modelling this prototype consideration must be given to the general operation and issues of feasible manufacture, product assembly, ongoing maintenance regimes and disassembly.

Design guidelines and digital-modelling guidance shall be provided in respect of product usability, product functions, user-interactions, design of fabricated or formed frames, stock componentry where relevant, assembly detailing if assemblies to form the general assembly

SUBMISSION COMPONENTS

PVP + Portfolio Publications

- **Master model + Part Models**
- **Assembly Model**
- **3D PDF**
- **Digital Analysis** – *FEA / LCA / Motion Study*
- **Technical Drawings – GA + Component Drawings**
- **Digital Still images**
- **Scripted Animation of product form + features + Functions**

Marking Sheet 2021/22	DESP:2000 CAD for Product Design 2 **Project 2:** **Digital Prototyping of a Hand Cranked Hoist proposal**

Project Summative Assessment

Deliverables Checklist:	Student Check	Assessor Check
Illustrated record of a coherent and structured digital modelling process		
Fully detailed digital prototype master model, part files and assembly files		
Record of the application of digital based testing processes in the developmental and summative evaluation of digital prototypes		
Digital Portfolio Presentation of the proposals digital prototype		
Set of digital prototype output files - STL,DXF,3D-PDF, SW		
Set of technical drawings + associated detailed tolerancing		

A*	A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	CF	F
100-80%	79-77	76-73	72-70	69-67	66-63	62-60	59-57	56-53	52-50	49-47	46-43	42-40	39-30	29-0

Terms 2 2018/19	**Student Name:**

Marking Criteria:	weighting	module LO's	marks
Evidence a coherent and structured Digital Prototyping Process	**10%**	1,2,3,4	
Evidence accurate detail in the digital modelling of the form, features and assembly secondary components	**35%**	1,2,3,4	
Evidence the application of digital based testing processes in the developmental and summative evaluation of digital prototypes	**10%**	3,4,5,6	
Prepare a digital portfolio presentation of the proposal prototype including animated narrative of Product Form, Features and Functions	**10%**	5,6,7,8,	
Prepare a set of archived files for related digital prototype outputs – STL,DXF,3D-PDF, SW	**10%**	7,8,	
Generate comprehensive set of technical drawings which are compliant to BS 8888 and associated tolerancing standards	**25%**	5,6,7, 8,	
Mark descriptors are the University's marking framework for assessment. Based on generic criteria, they cover a broad range of disciplines. Use of the descriptors is supported by full guidance can be found in your Subject & Programme Guide ('Marking Criteria). The generic mark descriptors form part of the University's regulations		Final Grade	

Assessor	**Moderator:**	**Date:**

PROJECT 2 SUBMISSION – BLACKBOARD UPLOAD

17:00 Monday week 25 21 /03/2022

DESP:2000 CAD for Products Designers 2:

Project 2 2021/22

Digital-Prototype-Modelling of a geared rowing machine

	TUTOR DIRECTED STUDY			
Study Weeks	**Lecture Series** **1hr per week**	**Rm: 1.32 CAD LAB Workshops** **2 hrs per week**		
		Digital Prototyping Process Phases	**Recorded Tutorials + Published PDF tutorials**	**SELF-DIRECTED STUDY** **8 hrs per week**
Week 15 10/01/2022	PROJECT WEEK 1 **Project Process Overview Digital Prototyping of Functional Performance** *Solidworks Analytical Tools Video Based proposal Narratives*	***SW Motion Study Linkage + Structure Modelling***	*Modelling Primary form of the reference product configuration Prepare a base animation of the movement limits*	**GENERATE SKETCHBOOK PRO SCALED RENDERED ELEVATIONS** Based on the existing product configuration generate concepts visuals of re-designed product brand form
Week 16 17/01/2022	PROJECT WEEK 2 **Application of Digital Analytical Tools in Product Development**	***Solidworks Secondary Features Modelling***	*Modelling secondary features of the 'structural-rig' of the existing product configuration*	**UNDERTAKE MODELLING OF STRUCTURAL ELEMENTS AND PRIMARY HOIST FUNCTIONS** – movement scope and range Apply re-brand-design culture from inserted Sketchbook Pro- renders
Week 17 24/01/2022	PROJECT WEEK 3 **Iterative Digital Modelling in optimising functional performance**	***Solidworks FEA***	*Modelling a test of the load-structural capacity and balance of the lift function*	**UNDERTAKE MODELLING OF SECONDARY FEATURES** – consider assembly issues, usability and manufacturability
Week 18 31/01/2022	PROJECT WEEK 4 **Pivots, Articulating features and motions**	***Solidworks Motion Study***	*Modelling a gearing assembly and animating gearing advantage*	**COMPLETE A SCHEMATIC MODEL OF PIVOTS + ARTICUATING FORMS** – undertake a motion study to demonstrate performance parameters
Week 19 07/02/2022	PROJECT WEEK 5 **Detailing of engineered mechanisms as SW models**	***Modelling Sub-Assemblies***	*Modelling details of pivots and articulating features subassemblies of a handle - drive acting on a gearing mechanism*	**COMMENCE RESOLUTION OF THE DIGITAL PROTOTYPE** Resolve finalisation of Master File details, part-files sand sub-assembly files. ARCHIVE FILES
Week 20 14/02/2022	PROJECT WEEK 6 **BS888 standards and the contemporary alternative – Model Based Definition**	***BS:8888 overview*** *Review on GA's + Part Files + Sectional Details Dimensions*	*Review case study of tech drawings submission – Strategy for Layout of GA, Component, Sub-Assemblies*	**DEVELOP GENERAL ASSEMBLY MODEL -** Based on part files + sub-assemblies, plus the Masterfile. ARCHIVE FILES
Week 21 21/02/2022	PROJECT WEEK 7 ***BS:8888 Tolerances*** **+ Tolerancing Strategies**	***BS:8888 Tolerances + Tolerancing Strategies*** for general assembly, sub-assembly and single part components	*Case Study Exercises Dimensioning of drawings and applying Tolerancing of Geometry, Dimensions and assembly fits*	**GENERATION OF TECHNICAL DRAWINGS** GA, Sub assembly, Part Drawings as sheet layouts with consideration of scale, areas for dimensioning and notation. ARCHIVE FILES
Week 22 28/02/2022	EMPLOYABILITY WEEK	PROGRAMMED ACTIVITIES		
Week 23 07/03/2022	PROJECT WEEK 8 **Compiling Proposal Technical Drawings + Specification Notation**	***SW Visualise scripted animations***	*Generating scripted animations of product functions + performances*	**DIMENSIONING AND SCHEDULE OF TOLERANCES** *on geometry, dimensions and fits across all drawing sheets*
Week 24 14/03/2022	PROJECT WEEK 9 **Compiling Product Proposal Video Narratives**	***Adobe Premier*** *Compositing multiple-aspect video presentations*	*Compile video narratives of product form, interactions and performative functions*	**SCRIPTED ANIMATION PROPOSAL FUNCTION** *Generating scripted animation of your proposal product function + performance*
Week 25 21/03/2022	PROJECT WEEK 10 PREVIOUSLY RECORDED **Bonus Lecture** *SW - Topology Optimisation*	*PROJECT SUBMISSION Blackboard Upload 17:00am 21/03/2022*		**PRODUCT FUNCTION SHOW REEL CLIP** *Compile video narrative of product form, interactions and performative functions – use animations, stills, apply timed-annotation*