Syllabus
Course description

Course title	**Project Product Design 2d** **"BIKE+"**
Course code	97167
Scientific sector	Module 1: CEAR-08/D (ex ICAR/13) Module 2: CEAR-08/D (ex ICAR/13) Module 3: PHIL-04/B (ex M-FIL/05)
Degree	Bachelor in Design and Art (L-4)
Semester	Summer semester 2024/25
Year	2nd
Credits	19 (Module 1: 8 CP, Module 2: 6 CP, Module 3: 5 CP)
Modular	Yes

Total lecturing hours	180 (Module 1: 90, Module 2: 60, Module 3: 30)
Total hours of self-study and/ or other individual educational activities	295 (Module 1: about 110, Module 2: about 90, Module 3: about 95)
Attendance	not compulsory but recommended
Prerequisites	To have passed Product Design 1; to have certified the language level proficiency B1 in the modules' languages in years following the first
Maximum number of students per class	20

Course description	*The course belongs to the class "caratterizzante" (module 1), "di base" (module 2) and "affine integrativa" (module 3) in the curriculum in Design.* ***Description Module 1 – Product Design:*** DE In Kooperation mit dem Hersteller SKS werden Produkte für Fahrräder und rund ums Fahrradfahren entwickelt. SKS hat eine lang zurückreichende Tradition, ist führend im Bereich für Fahrradzubehör und wird uns während des Projekts als Partner unterstützen und begleiten. Wie kann die Funktion und der Einsatzbereich bestehender Fahrräder durch pfiffige Accessoires erweitert, ihre Verwendung im Alltag komfortabler, zugänglicher, zuverlässiger und vielseitiger gemacht werden - oder schlicht: den Spaß am Radfahren fördern? Was sind die Hindernisse, Herausforderungen und Bedürfnisse beim Fahrradfahren? Wo entstehen

Beziehungen und Verbindungen zu anderen Strukturen oder Systemen? Wie können diese überbrückt oder bespielt werden?

Unsere Recherchen werden sehr praxisnah und meist im Feld verlaufen, durch Beobachtung, Intervention und Dokumentation. Unterwegs auf dem Rad bekommen wir schnell ein Gespür für mögliche Nutzungsszenarien die Zweckmäßigkeit möglicher Hilfsmittel.
Wir untersuchen vorhandene Produkte, Markenwelten und Nutzergruppen, machen uns mit der Fahrradtechnik vertraut und testen eigene Ideen direkt am Modell.
Auf der Messe "Cyclingworld Düsseldorf" werden wir einen guten Rundumblick aktueller Trends erhalten.
Der anschließende Besuch des Headquarters von SKS verschafft uns Einblicke hinter die Kulissen des Unternehmens und die Abläufe in Entwicklung, Produktion und Marketing. In mehreren Treffen mit SKS werden die eigenen Visionen und Produktansätze präsentiert, diskutiert und stetig fortentwickelt, um sie anschließend in die technische Umsetzung zu überführen.
Die Designs sollen dabei auf die potentielle Herstellung bei SKS ausgerichtet sein. Dabei werden Fragen der Fertigung, Verarbeitung, Montage, Stückzahlen, Kosten und Produktsicherheit entstehen. Darüber werden wir ermitteln, wie sich die Produktkonzepte in das bestehende Corporate Design der Marke übertragen lassen. Die Entwickler von SKS stehen uns hier mit Rat und Tat zur Seite. Die Ergebnisse werden nach Abschluss des Semesters als Designstudie in einem Katalog zusammengefasst. Den Studenten wird in Aussicht gestellt, dass ausgewählte Designs oder Teile davon durch SKS realisiert werden.

EN
In co-operation with the manufacturer SKS we will develop products for bicycles and all-around cycling.
SKS has a long tradition, is a leader in the field of bicycle accessories and will support and advise us during the project.

How can the function and operation of existing bicycles be extended with smart accessories, how can their use in everyday life be made more comfortable, accessible; reliable and versatile - or simply: make cycling more fun? What are the obstacles, challenges and needs when cycling? Where do relationships and connections to other structures or systems arise? How can these be bridged or utilised?

Our research will be very practical and mostly conducted in the field, through observation, intervention and documentation. When travelling by bike, we quickly get a feel for usage scenarios and the practicality of possible devices. We will examine existing products, brand worlds and user groups, familiarise ourselves with bicycle technology and test our own ideas directly on the model. At the 'Cyclingworld Düsseldorf' trade fair, we will get a good all-round view of current trends. A visit to the SKS headquarters will give us an insight behind the scenes of the company and the processes in development, production and marketing. In several meetings with SKS, our own visions and product approaches will be presented, discussed, continuously developed and transfer them into technical realisation.
The designs should be geared towards potential production at SKS. This will raise questions about materials, processing, assembly, quantities, costs and product safety. We will also determine how the product concepts can be transferred to the brand's existing corporate design. The developers at SKS will be on hand to provide advice and support. The results will be summarised as a design study in a catalogue at the end of the semester. There will be the chance that selected designs or parts of it will be realised by SKS.

Description Module 2 – Digital Fabrication

EN

3D modelling and design is a language that connects a designer with his/her own ideas, at first, and later, with an entire chain of designers, companies, and manufacturers. This means that a designer must be able to read, understand and write the rules of 3D design. Digital modeling is not just programming; it is something much broader: it is intrinsic to the design itself and strongly linked to every phase of the creative process. Through lectures, case studies, workshops and through a semester long exercise, students will learn to observe, conceptualize, rationalize, model and materialize their ideas in a systematic, logical, and production-oriented way. The geometrical limitless nature of parametric design will provide them with not only a modelling tool, but a new way of thinking and creating products and systems.

IT

La modellazione e il design 3D sono un linguaggio che connette il designer prima di tutto con le proprie idee e,

	successivamente, con un'intera rete di designer, aziende e produttori. Questo significa che un designer deve saper leggere, comprendere e scrivere le regole della progettazione tridimensionale. La modellazione digitale non è solo programmazione; è qualcosa di molto più ampio: è parte integrante del processo progettuale ed è strettamente legata a ogni fase della creatività. Attraverso lezioni, casi studio, workshop e un esercizio semestrale, gli studenti impareranno a osservare, concettualizzare, razionalizzare, modellare e concretizzare le proprie idee in modo sistematico, logico e orientato alla produzione. L'infinita libertà geometrica del design parametrico fornirà loro non solo uno strumento di modellazione, ma un nuovo modo di pensare e creare prodotti e sistemi. ***Description Module 3 – Theories and languages of product design*** The integrated module focuses on exploring key stages of the professional design process, emphasizing theory, research, and strategy. This year's course will use the project-theme as a pivotal center, a core from which to first explore and be active in one's surroundings. In particular, the theme of the bicycle will be addressed from all possible directions: its historical, social, and technological background; its relation to architectural, urban, and environmental issues; its position at the center of modern and contemporary human mobility; and its cultural significance. In addition, the module will focus on different methodologies of design, such as field exploration, documentation, the definition of research criteria, reports, discussion of reports, the definition of concepts, the relation between concept and form, creation, presentation, communication, relation to a company, interaction, impact, and improvement.

Specific educational objectives	**Knowledge and understanding** - have acquired one's own project methodology in the field of product design. This methodology includes the ability to oversee all phases of design, from the generation of ideas to the realisation of the finished project. Through the integrated teaching of project subjects and subjects of a technical, scientific and theoretical nature, graduates will be able to simultaneously address all these aspects and consider them as synonymous with the development of a project that is successful on a formal, technical, scientific and cultural level.

Lecturer	***Module 1 – Product Design*:** Sebastian Camerer email: sebastian.camerer@unibz.it Sebastian Camerer / Free University of Bozen-Bolzano (unibz.it) ***Module 2 – Digital Fabrication:*** Ofer Kristal email: ofer.kristal@unibz.it Ofer Kristal / Free University of Bozen-Bolzano (unibz.it) ***Module 3 – Theories and languages of product design*** Stefano Faoro email: Stefano.Faoro@unibz.it Stefano Faoro / Free University of Bozen-Bolzano
Scientific sector of the lecturer	Module 1 – Sebastian Camerer: CEAR-08/D (ex ICAR/13) Module 2 – Ofer Kristal: CEAR-08/D (ex ICAR/13) Module 3 – Stefano Faoro: PHIL-04/B (ex M-FIL/05)
Teaching language	Module 1 – German Module 2 – Italian Module 3 – English
Office hours	Module 1: Tu-Wed: 8:30 – 10:30 by appointment Module 2: Tu: 14:00-15:00 Module 3: Monday: 12:00 – 13:00
List of topics covered	**Module 1:** EN Design and development of everyday objects, in particular the design of accessories for bicycles and cyclists. Project management and processes in co-operation with manufacturers or clients. Basic methods of design and product development:

	Analysing the task, generating ideas, phases of design development, through to transfer to technical implementation. Creativity and presentation techniques, modelmaking, product semantics, interface design and user experience. Planning for the series production of products: Manufacturing processes for products made from materials such as plastic, metal, textiles, etc. Construction and planning of components, connections of components and integration of electronics. Technical and safety-relevant requirements for products, especially in outdoor areas. Tooling, material- and surface processing and design for assembly. Design for the market: Define usergroups and requirements. Form-languages, Branding, Product graphics and Packaging of products. DE Design und Entwicklung von Alltagsgegenständen, insbesondere die Gestaltung von Zubehören für Fahrräder und Radfahrer. Projektmanagement und Prozesse in Zusammenarbeit mit Herstellern oder Kunden. Grundlegende Methoden der Design- und Produktentwicklung: Analyse der Aufgabenstellung, Ideenfindung, Phasen der Designentwicklung bis hin zum Transfer in die technische Umsetzung. Kreativitäts- und Präsentationstechniken, Modellbau, Produktsemantik, Interface Design und User Experience. Planung für die Serienfertigung von Produkten: Fertigungsverfahren für Produkte aus Materialien wie Kunststoff, Metall, Textilien usw. Konstruktion und Planung von Bauteilen, Verbindungen von Komponenten und Integration von Elektronik. Technische und sicherheitsrelevante Anforderungen an Produkte, insbesondere im Außenbereich. Werkzeugbau, Material- und Oberflächenbearbeitung und Konstruktion für die Montage. Design für den Markt: Definieren von Nutzergruppen und Anforderungen. Formsprachen, Branding, Produktgrafik und Verpackung von Produkten. **Module 2:** EN The course aims at establishing a functioning relation between research / analysis / sketching / digital modelling and digital fabrication. Main phases: - Research and analyze existing bicycle add-ons in terms of form, function, and integration with the bicycle body.

- Develop a systematic intervention language through writing, drawing, and sketching to describe the logic behind the add-ons' behavior and adaptability.
- Utilize visual scripting (Grasshopper) or 3D modeling (Rhino) to define the formal and parametric logic of the add-on.
- Generate a (parametric) digital model that allows variation and customization based on defined constraints.
- Explore expressive and complex 3D geometries through computational design techniques.
- Use digital fabrication methods to create a prototype of the digital model.
- Refine the design based on material, functionality, and fabrication constraints.
- Finalize the add-on as a functional, parametrically designed object integrating expressive geometry and practical use.

IT
Il corso mira a stabilire una relazione funzionale tra ricerca, analisi, sketching, modellazione digitale e fabbricazione digitale. Fasi principali:

- Ricercare e analizzare gli add-on esistenti per biciclette in termini di forma, funzione e integrazione con il corpo della bicicletta.
- Sviluppare un linguaggio di intervento sistematico attraverso la scrittura, il disegno e lo sketching per descrivere la logica del comportamento e dell'adattabilità degli add-on.
- Utilizzare la programmazione visuale (Grasshopper) o la modellazione 3D (Rhino) per definire la logica formale e parametrica dell'add-on.
- Generare un modello digitale (parametrico) che consenta variazioni e personalizzazioni in base a vincoli definiti.
- Esplorare geometrie 3D espressive e complesse attraverso tecniche di design computazionale.
- Utilizzare metodi di fabbricazione digitale per realizzare un prototipo del modello digitale.
- Perfezionare il design in base ai vincoli di materiale, funzionalità e fabbricazione.
- Finalizzare l'add-on come un oggetto funzionale e parametrico, che integri geometrie espressive e un uso pratico.

Module 3:
This course is designed to help students acquire professional skills and knowledge through a broad

	understanding of scientific principles. The key objectives are: • To establish a solid theoretical and socio-cultural foundation, combining technical skills with critical reflection. • To acquire essential theoretical knowledge in the languages and theories of product design, enabling students to successfully carry out design projects. • To develop the ability to critically assess their work and navigate the complexities of contemporary society. • To gain foundational knowledge in key theoretical areas related to the overarching project topic. • To understand the culture of design, with a specific focus on product design. • To learn how to observe and analyze contemporary cultural and social phenomena that influence both design and art. • To build independent judgment, allowing students to evaluate their work, use appropriate interpretive tools in various contexts, and address social and ethical aspects of design. • To communicate at a professional level, justifying their choices from formal, technical, scientific, and theoretical viewpoints. • To work for a company, to understand how a brand functions, to understand the difference between a brand and another brand. • To be able to find areas in which a company is placed and operates in a specific market. • Ask the right questions and provide the right answers.
Teaching format	**Module 1** Lectures, Workshops/Exercises, Studio-Work, Field Work, Excursions, individual reviews **Module 2** Lectures, Tutorials, Case studies, Semester's project, Personal reviews **Module 3** Lectures, seminars, exercises, group work.

Expected learning outcomes	**Disciplinary competence** *Knowledge and understanding* - have acquired the basic technical, scientific and theoretical knowledge necessary to realise a project in the field of product design.

	- have acquired the basic knowledge necessary for further Master's studies in all components of project culture as well as in technical, scientific and theoretical subjects *Applying knowledge and understanding* - use the basic knowledge acquired in the technical, scientific and theoretical fields to realise a mature project to recognise the main phenomena of contemporary. - make use of the skills acquired during the course of study in the event of continuing studies in a Master's degree programme in the field of design and to develop them further. **Transversal competence and soft skills** *Making judgements* - Be able to make independent judgements for the purpose of developing their own design skills and in relation to all those decisions (technical, scientific and theoretical) that are necessary to bring a project to completion. *Communication skills* - present an independently realised project in the field of product design in the form of an installation, orally as well as in writing in a professional manner. *Learning skills* - have learned a design methodology at a professional level - in the sense of being able to identify, develop and realise solutions to complex design problems by applying the acquired knowledge in the technical, scientific and theoretical fields - in order to start a professional activity and/or continue their studies with a master's degree programme. - have developed a creative attitude and learned how to enhance it and develop it according to their own inclinations. - have acquired basic knowledge in theoretical, technical and scientific subjects as well as a study methodology suitable for continuing studies with a Master's degree programme.

Assessment	**Module 1**: Presentation of the project: each candidate will present his work through graphic drawings, a physical model, photographs, a synthetic text and a concentrate of his

work in a booklet. The design path, the final result and all the materials delivered will be evaluated. The presentation of the project will be public.

Materials to be delivered: three days before the examination date the following documents must be delivered to the project assistant:

1. construction drawings;
2. model of proportions or functional model (possibly in 1: 1 scale);
3. 3-5 photos that highlight the characteristics of the final elaborate format 10cm x 15cm, 72 dpi, RGB, jpg and 300 dpi, CMYK, tif;
4. short summary text where the final paper is presented (max 500 characters, doc or rtf);
5. the data need to be concentrated in a booklet in A5 format. The facsimile of the booklet will be delivered and explained to the students one month before the end of the project.

NB: The timely delivery of all the materials being examined is essential for admission to the exam itself.

Module 2:
The final assessment will be the result of work conducted during the entire semester. The following will be evaluated:
• The ability to express ideas through technical representations (2D / 3D Drawings – models).
• The motivation and the commitment shown during the module and in the atelier.
• The spirit of observation and the curiosity displayed.
• The ability to develop functional ideas.
• The ability to create a methodical framework and work systematically.

Materials to be delivered: three days before the examination date the following documents must be delivered:
- 3D Models / Codes
- 2D drawings
- Physical models of the add-on
- Conceptual Sketches and Diagrams
- Booklet

Module 3
The exam is included as an integral part of the final presentations concerning the project with particular

	reference to those contents that have been explored, presented, and discussed in the classroom.
Assessment language	The same as the teaching language
Evaluation criteria and criteria for awarding marks	*By exam's date, each student must upload on the Microsite of the faculty detailed documentation of the work done during the course.* designart.unibz.it *Documentation is an integral part of the exam. The documentation must include visual documentation and an abstract of the project.* The final assessment is based on the content of all the exercises according to the following criteria: **Module 1** The quality and clarity of the research, the creativity and the originality of the design concept, the quality and clarity of the design process, of the development and realization of the project such as the professionalism and consistency of the presentation and documentation. Also contributing to the final evaluation will be the personal commitment and initiative in the studio-work: participation and punctuality on lectures, the continuity, attention and curiosity demonstrated in the project. **Module 2** - (15/100) Participation, punctuality, learning abilities. - (25/100) Ability to research, observe, analyse and create logic / conceptual links. - (25/100) Ability to express ideas through 3D models / 2D drawings. - (35/100) Quality of final submission **Module 3** • Precision in presenting subjects, ideas, theoretical concepts, analysis, and conclusions • Effectiveness in communicating and explaining key topics, concepts, and analyses • Command of terminology and language specific to the course • Evidence of understanding and mastery of the material • Capability to synthesize, assess, and link various topics (skill in contextualizing information) • Proficiency in critical analysis and evaluation

	• Skill in restating and summarizing content in a clear and original manner

Required readings	**Module 1**: - **Module 2**: **-** **Module 3**: -
Supplementary readings	**Module 1**: - **Module 2**: Arturo Tedeschi, *My AAD – Algorithms Aided Design: Parametric Strategies Using Grasshopper,* Le Penseur Publisher, Brienza 2014 Carlos Alberto Montana Hoyos, *Bio-ID4S: Biomimicry in Industrial Design for Sustainability,* VDM Verlag, Brienza 2010 **Module 3**: [Useful papers will be provided during the semester to address the course topics.] Design methodology: Sennett, R. (2024). Democracy and Urban Form. Sternberg Pr. Venturi, R., Brown, D. S., & Izenour, S. (1977). Learning from Las Vegas, revised edition: The Forgotten Symbolism of Architectural Form. MIT Press. Wojtowicz, I. (2024). Interrogative Design. The MIT Press.