Module Handbook

Lighting Design-
Architectural Lighting and Design Management

Module		lecturer
PM 1	**Design Criteria**	**Harald Hofmann**
PM 2	**Daylight**	**Thomas Römhild/ Acharawan Chutarat**
PM 3	**Artificial Lighting**	**Harald Hofmann/ Yvonne Weiss**
PM 4	**Design Project I: Conceptual Lighting Design**	**Jan Blieske**
PM 5	**Design Methods 1: Basics**	**Thomas Römhild/ Nathan Thompson**
PM 6	**Lighting Applications and Sustainability**	**Paul Traynor/ Thomas Römhild**
PM 7	**Strategic Management**	**Marcus Hackel**
PM 8	**Design Project II: Detailed Lighting Design**	**Michael Rohde/ Chanayaporn Chuntamara**
PM 9	**Design Methods 2: Visualisation and Calculation**	**Thomas Römhild**
PM 10	**Design and Economics**	**Marcus Hackel**
PM 11	**Project Management**	**Marcus Hackel**
PM 12	**Design Project III: Selected Lighting Design Principles**	**Thomas Römhild**
PM 13	**Design Methods 3: Branding and Marketing**	**Thomas Römhild/ Mr. Bussrakumpakorn**
PM 14	**Thesis Seminar**	**Thomas Römhild**
PM 15	**Master- Thesis and Colloquium**	

guest lecturer:
Ms. Katherina Xin (Co-Director of Centre for Globalisation of Chinese Companies, CEIBS)
Mr. Roger Narboni (Lighting Designer Paris)
Mr. Jan Ejhad (former Prof. at KTH Stockholm)

Module	**PM 01 Design Criteria**
Topics	Contemporary Design Theory and Practice Design Criteria for Architectural Lighting Light Perception Light and Colour Light and Space Physics of Daylight and Artificial Light
Contents	Students will become familiar with the historical background of architectural lighting and contemporary influences on design. Criteria for successful designs will be developed and contrasted with related areas like event lighting. Fundamentals of visual perception and consequences for architectural lighting will be presented. The visual process will also be studied in order to develop a standardised system for light and colour. Metrics for the physical properties of light and luminaires and the relationships between light, colour and space, which are important for architectural lighting design, will be studied. An appreciation for the physical differences between daylight and artificial light will be gained besides the importance of these sources in influencing the interpretation of architecture. Finally, a comprehensive overview of the technical and visual properties of lamp types will be demonstrated.
Objectives	▪ Articulate the important characteristics of architectural lighting including evaluating lighting systems using architecturally relevant criteria. ▪ Understand the differences between the physical properties of light and the effects of human perception. ▪ Familiarity with the vocabulary describing the physical properties of lighting systems as well as the recommendations and regulations concerning appropriate designs. ▪ Describe the qualitative and quantitative differences between daylight and artificial light including effects on architecture during the day and night.
Format	Presence Seminars (SU)
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master's Programme in Lighting Design
Duration	2 Semester
Frequency	Yearly
Work Estimate	150 h
Credits	6 CR
Examination	Assessment, Written Examination 90 min
Maximum Attendees	25
Literature	Lam, William M.C. "Perception and Lighting as Formgivers for Architecture" Book Ciompany ISBN 0-07-036094-4 Major, Mark; Speiras, Jonathan; Tischhauser, Anthony: "Made of Light – The Art of Light and Architecture" Birkhaeuser Publishers ISBN 10-3-7643-6860-8 Narboni, Roger "Lighting the Landscape" Birkhaeuser Publishers ISBN 3-7643-7079-3 Brandi, Ulrike "Lightbook: The Practice of Lighting Design" Birkhaeuser Publishers ISBN 3-7643-6303-7 Ganslandt, Hofmann Handbuch der Lichtplanung ISBN: 978-3322904508 Reader Module 1

Module	**PM 02 Daylighting**
Topics	Fundamentals of Daylight Daylight Controls Shading Systems for Heat and Glare Management Daylight Quality and Distribution Interaction of Daylight and Artificial Light
Contents	By using examples fundamentals of lighting with daylight will be presented. After understanding the sun's pathway an application of shading systems to minimize the negative impacts of heat gain and glare will be developed. The concept of a daylight quotient will be introduced and calculated to assist with evaluating the quality of daylight in indoor spaces. Additionally, the relationship between daylight and artificial light will be considered including the effects on energy use and design. Relevant thermodynamic properties of buildings will be covered together with the possibilities for the integration of lighting into building control systems.
Objectives	• Design a space giving consideration to the influences of daylight and artificial light. • Evaluate lighting designs using the criteria developed considering daylight and artificial light.
Format	Presence Seminars (SU) Practical Exercises
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master's Programme in Lighting Design
Duration	2 Semester
Frequency	Yearly
Work Estimate	225 h
Credits	9 CR
Examination	Assessment, Alternative Examination
Maximum Attendees	25
Literature	Lam, William M.C. "Sunlight as Formgiver for Architecture" Tregenza, Peter and Wilson, Michael „Daylighting: Architecture and Lighting Design" Köster, Helmut "Dynamic Daylight Architecture: Basics, Systems, Projects" Junichiro, Tanizaki "In Praise of Shadow " DiLaura, David, Mistrick, Richard, Houser Kevin and Steffy Gary "The Lighting Handbook : Reference and Application" IESNA, New York, 2011 Ander, Gregg D. "Daylighting: Performance and Design" Van Nostrand Reinhold, New York, 1995 ISBN 0-442-01921 Evan, Benjamin H. "Daylighting in Architecture" McGrall-Hill, New York, 1981 ISBN 0-07-019768-7

	Steffy, Gary R. “Architectural Lighting Design” Van Nostrand Reinhold, New York, 2001 ISBN 0-442-20761-1 Lechner, Norbert “Heating, Cooling, Lighting : Sustainable Design Methods for Architects” John Wiley & Sons, 2008 ISBN 0-471-62887-5 Millet, Marietta S. “Light Revealing Architecture” Van Nostrand Reinhold, New York, 1996 ISBN 0-442-01887-8. Phillips, Derek “Lighting in Architectural Design” McGrall-Hill, New York, 1964

Module	**PM 03 Artificial Lighting**
Topics	Optical Systems Lamp Types Interior Lighting Concepts Exterior Lighting Concepts Design Guidelines and Regulations Lighting Calculations
Contents	The optical systems for the control of daylight and artificial light will be presented together with their application in luminaire and daylight system designs. The characteristics of luminaires and lamps will be considered as well as their impacts on mounting and geometry. Guidelines for the use of various lamps will be developed for application as general, orientation, media and focal accent lighting. Indoor and exterior lighting concepts will be evaluated and recommendations developed for layout using focussed small projects. Methods for measuring light as well as calculating intensity of point sources and room systems will be discussed and used in practical exercises.
Objectives	▪ Define and describe the requirements for a light system given a desired light distribution. ▪ Select and specify appropriate lamps and luminaires for use in a designed lighting system. ▪ Develop appropriate interior and exterior lighting design for given usage scenarios ▪ Correctly identify lamp types ▪ Measure and interpret light intensity and luminaire distribution ▪ Evaluate a given lighting system using relevant lighting criteria
Format	Practical Exercises (SU) Presence Seminars
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master’s Programme in Lighting Design
Duration	2 Semester
Frequency	Yearly
Work Estimate	225 h
Credits	9 CR
Examination	Assessment, Alternative Examination Practical Exercises incorporating design principles distributed over the semester will be presented at the beginning of the following semester.

Maximum Attendees	25
Literature	Ganslandt, Hofmann Handbuch der Lichtplanung ISBN: 978-3322904508 Reader Module 4

Module	**PM 04 Design Project I: Conceptual Design**
Topics	Planning and Design
Contents	Students will design and develop lighting concepts for given spaces and usages including lamp and luminaire selection, geometry and distribution. The light and luminaire distributions will be displayed graphically and the associated concept described and visualised. Requirements for electrical connections in various situations will be estimated.
Objectives	▪ Design and present appropriate exterior and interior lighting concepts for given usages. ▪ Demonstrate suitable knowledge of lamp classification ▪ Measure and verify light intensity and distribution of a lighting system
Format	Design Project
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master's Programme in Lighting Design
Duration	2 Semester
Frequency	Yearly, winter semester
Work Estimate	225 h
Credits	9 CR
Examination	Assessment ,Design Project Examination1: E3 Examination2: E3
Maximum Attendees	25
Literature	Ganslandt, Hofmann Handbuch der Lichtplanung ISBN: 978-3322904508 Reader Module 4

Module	**PM 5 Design Methods 1: Basics**
Topics	Understanding the structure and details of the design process
Contents	Three specific tasks will be given to the students to enable them to learn strategies for starting a design. Students will be encouraged to discover different possible ways to solve design problems. The design exercise for the Projects 2 and 3 will be introduced.
Objectives	• The students will learn to develop an independent design process. • They will be able to develop and structure the design brief and organise the design process to meet time schedules.
Format	Lecture (V;SU)
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master's Programme in Lighting Design
Duration	2 Semester
Frequency	Yearly
Work Estimate	150 h
Credits	6 CR
Examination	Assessment, Alternative Examination
Maximum Attendees	25

Module	**PM 06 Lighting Applications and Sustainability**
Topics	Analysis and Abstraction of Lighting Problems Schematic Solution Design Daylight and Artificial Light in Combination Sustainable Lighting
Contents	Typologies of lighting requirements with respect to technical, perception and cultural considerations will be developed through analysis and design. An understanding for the relationship between lighting design and Building Climate will be gained. In particular, consideration for the energy usage of a sustainable lighting design and the integration with the concept for energy usage in the building will be acquired.
Objectives	▪ Demonstrate an understanding for the relationship between usage typologies and criteria for lighting through application in a specific lighting design. ▪ Develop solutions in detail and present visually. ▪ Understand the impact of lighting on Climate and design accordingly Of Buildings
Format	Lecture (V;SU)
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master's Programme in Lighting Design
Duration	2 Semester
Frequency	Yearly

Work Estimate	225 h
Credits	9 CR
Examination	Assessment, Alternative Examination
Maximum Attendees	25
Literature	Cuttle, C., Towards the Third Stage of the Lighting Profession, (Lighting Reserch & Technology), 2009 ILE., Guidance Notes for the Reduction of Obtrusive Light, 2005 Lam, W., Approach to Design of the Luminous Environment, 1976 Lam, W., Perception and Lighting as Formgivers for Architecture, 1997 Ruffles, P., LG7, CIBSE Tanizaki, T., In Praise of Shadows Various Authors, The Structure of Light: Richard Kelly and the Illumination of Modern Architecture (Yale School of Architecture) Various Authors, The SLL Code for Lighting, 2012 Various Authors, Guidelines for Specification of LED Lighting Products 2012, SLL Internet Sites: http://archive.luxmagazine.co.uk/2012/02/part-l-2013-impact-of- change/ http://www.erco.com/guide/startseite-ratgeber/general/start/en/ http://ledlight.osram-os.com/knowledge/standards-regulations/ http://www.sll.org.uk/guide-to-obtrusive-light-published

Module	**PM 07 Strategic Management**
Topics	Developing strategic approaches to ensure the economic success of a lighting design office.
Contents	Using proven methodologies, a strategic concept for an architectural lighting office will be developed and presented in the form of a business plan. The following stages will be demonstrated: Analysis of economic conditions affecting lighting design offices Customer needs analysis Development of office philosophy Strategic development based on analysis Forming implementation strategies
Objectives	Ability to autonomously and independently apply knowledge in the practice of strategic management.
Format	Lecture
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master's Programme in Lighting Design
Duration	1 Semester

Frequency	Yearly
Work Estimate	150 h
Credits	6 CR
Examination	Project Work E3
Maximum Attendees	25
Literature	David Collins e.a. Harvard Business Review on Corporate Strategy Mcgraw-Hill Professional, 1999 ISBN 978-1578511426 Robert Kaplan, David Norton, The Balanced Scorecard: Translating Strategy into Action Mcgraw-Hill Professional, 1996 ISBN 978-0875846514 Robert Kaplan, David Norton, Strategy Maps: Converting Intangible Assets into Tangible Outcomes Mcgraw-Hill Professional, 2004 ISBN 978-1591391340 Philip Kotler, Gary Armstrong, Principles of Marketing Prentice Hall College, 10.ed, 2004 ISBN 978-0536131805 Philip Kotler e.a. Marketing Management Prentice Hall International; European ed., 2009 ISBN 978-0273718567 Theodore Levitt, Marketing Myopia Harvard Business School Publishing, 2008 ISBN 978-1-4221-2601-1 Michael Porter, Competitive Strategy: Techniques for Analysing Industries and Competitor Free Press, New York, 1980 ISBN 0-7432-6088-0 Michael Porter, Competitive Advantage Simon & Schuster; New ed., 2004 ISBN 978-0743260879 Petty, Palich, Hoy, Longenecker Managing Small Business – An Enterpreneurial Emphasis South Western College Publishing ISBN: 9781111821173 http://www.existenzgruender.de/englisch/self_employment/launch/business_plan/index.php http://www.sba.gov

Module	**PM o8 Design Project II: Detailed Lighting Design.**
Topics	Usage-Aligned Design
Contents	Students will learn about design possibilities with light through a specific planning task that incorporates their own creative goals. Typology will be the starting point for the development of the design. The design will be evaluated for technical feasibility using theoretical, mathematical and experimental methods.
Objectives	▪ Identify and apply discrete steps in the process for lighting design ▪ Develop individualised design methodology and practice
Format	Design Project
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master's Programme in Lighting Design

Duration	2 Semester
Frequency	Yearly
Work Estimate	225 h
Credits	9 CR
Examination	Assessment, Design Project / Project work E6
Maximum Attendees	25

Module	**PM 09 Design Methods 2: Visualisation and Calculation**
Topics	Lighting Typology Methods for Calculation and Visualisation
Contents	The design task should be classified typologically and the associated design parameters developed. The skill of presentation with visualisation programs and calculations for various lighting parameters will be demonstrated with concrete examples.
Objectives	▪ Prepare the fundamentals of an independent approach to design work ▪ Evaluate lighting designs using mathematical concepts ▪ Demonstrate design results visually
Format	Lecture
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master's Programme in Lighting Design
Duration	1 Semester
Frequency	Yearly
Work Estimate	150 h
Credits	6 CR
Examination	Alternative Examination
Maximum Attendees	25

Module	**PM 10 Design and Economics**
Topics	Economic success factors: interdisciplinary work and strategic team composition, customer relationship management, product design management and funding

Contents	Using a case study, students will learn to apply relevant scientific and business analysis to the consideration of an architectural lighting design office. The criteria applied will include: Teamwork and networking as a component of management Customer relation management Brand management and product design management Accounting Managerial accounting
Objectives	▪ Ability to autonomously and independently apply knowledge concerning strategic team composition, product design, customer relationship management and financial management in practice.
Format	Lecture
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master's Programme in Lighting Design
Duration	1 Semester
Frequency	Yearly
Work Estimate	150 h
Credits	6 CR
Examination	Project Work E3
Maximum Attendees	25
Literature	Petty, Palich, Hoy, Longenecker Managing Small Business – An Enterpreneurial Emphasis South Western College Publishing ISBN: 9781111821173

Module	**PM 11 Project Management**
Topics	Process and project management in national and international contexts
Contents	The following relevant skills for successful national and international project management will be developed and applied: International project management Intercultural communication Project implementation Project coordination Flow chart analysis
Objectives	▪ Apply knowledge on international project management
Format	Lecture
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master's Programme in Lighting Design
Duration	2 Semester

Frequency	Yearly
Work Estimate	225 h
Credits	9 CR
Examination	Assessment, Project Work E6
Maximum Attendees	25
Literature	Griffin, Pustay, International Business Prentice Hall; 7th ed. 2012 Doole, Isobel, Lowe, Robin, International Marketing Strategy: Analysis, Development and Implementation Cengage Learning Services, 5th ed., 2008 Hofstede, Geert, Hofstede, Gert Jan, Cultures and Organizations – Software of the Mind Mcgraw-Hill Publ. Comp, 2nd ed., 2004 Petty, Palich, Hoy, Longenecker Managing Small Business – An Enterpreneurial Emphasis South Western College Publishing ISBN: 9781111821173

Module	**PM 12 Design Project III: Selected Lighting Design Principles**
Topics	Architectural Design Project
Contents	This design project will enable students to use light in support of the architectural character and socio-cultural backdrop of a building. The nature of light and the skill to methodically manipulate its use in design will be reinforced. An ability to realise specific design goals will be learned using a creative analogy as a starting point. The feasibility of the design should be evaluated using theoretical, mathematical or experimental methods.
Objectives	▪ Mastery of the keys skills of lighting design ▪ Strong command of design methods, design techniques and presentation skills
Format	Design Project and Presentation
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master's Programme in Lighting Design
Duration	2 Semester
Frequency	Yearly
Work Estimate	225 h
Credits	9 CR
Examination	Oral Presentation, Design Project/ Project Work E6
Maximum Attendees	25

Module	**PM 13 Design Methods 3: Branding and Marketing**
Topics	Symbolic Significance of Light Branding Through Light
Contents	Several topics with significance for resolution in the design process will be covered. Additionally, the cultural backgrounds of the students will assist in understanding cultural influence on design more generally. The importance of lighting as a marketing tool will also be considered.
Objectives	▪ Gain awareness of light and symbolism ▪ Appreciate the influence of different forms of lighting on particular environments ▪ Create distinctive scenarios which serve to form a brand image
Format	Lecture
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master's Programme in Lighting Design
Duration	1 Semester
Frequency	Yearly, winter semester
Work Estimate	75 h
Credits	3 CR
Examination	Alternative Examination
Maximum Attendees	25

Module	**PM 14 Thesis Seminar**
Topics	Master's Thesis Preparation
Contents	The focus of this seminar involves the preparation of each student's individual topic for presentation in the form of a master's thesis. The content will, therefore, be governed by the topics chosen. Principles of scientific work including methods and presentation will also be introduced.
Objectives	▪ Thematic preparation and presentation of the master's thesis
Format	Lecture (SU)
Prerequisites	Spoken and written English skills
Application	Required module for the Distance Master's Programme in Lighting Design
Duration	1 Semester
Frequency	Yearly, summer semester
Work Estimate	75 h
Credits	3 CR

Examination	Alternative Examination
Maximum Attendees	25
Literature	Stephen Bailey Academic Writing – A Handbook For International Students ISBN: 978-1-138-77850-4

Module	**PM 15 Master Thesis and Colloquium**
Topics	Editing of the final thesis to obtain the title **Master of Lighting Design-Architectural Lighting and Design Management**
Contents	
Objectives	
Format	SU
Prerequisites	Spoken and written English skills
Application	
Duration	3 months
Frequency	Summer semester
Work Estimate	525 h
Credits	18 + 3 CR
Examination	Project Work/ Design Project E24 Oral Examination 20min
Maximum Attendees	