Department of Design, IIT Hyderabad
B.Des Curriculum 2020-21

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Sn.	Course Code	Course Title	Credit	Type
Semester-I			
1	DS1013	Elements of Design	3	DC
2	DS1063	Principles of Design	2	DC
3	DS1070	Evolution of Design	2	DC
4	DS1020	Design Culture and Society	2	DC
5	DS1130	Film Appreciation	1	DC
6	ID1171	Fabrication Lab-1	2	BE
7	XXXXXX	English Communication	2	LS
8	XXXXXX	Life Sciences	1	BT
		TOTAL	**15**	

Sn.	Course Code	Course Title	Credit	Type
Semester-II			
1	DS1113	Basic Product Design	2	DC
2	DS1123	Basic Animation	2	DC
3	DS1173	Basic Photography	2	DC
4	DS1153	Basic Interaction Design	1	DC
5	DS1163	Basic Graphic Design	2	DC
6	ID1054	Digital Fabrication	2	BE
7	XXXXXX	LA/CA	2	
8	XXXXXX	Free Electives	2	FE
9	XXXXXX	Personality Development	1	LS
		TOTAL	**16**	

Sn.	Course Code	Course Title	Credit	Type
Semester-III			
1	DS2012	Illustrations and Drawing	2	DC
2	DS2023	Basic Typography	2	DC
3	DS2033	Introduction to Ergonomics	2	DC
4	DS2043	Programming for Designers	1	DC
5	DS2053	Storyboarding	2	DC
6	XXXXXX	Electives	2	DE
7	XXXXXX	LA/CA	2	
8	XXXXXX	Free Electives	2	FE
		TOTAL	**15**	

Sn.	Course Code	Course Title	Credit	Type
Electives offered Semester-III			
		PRODUCT DESIGN		
1	DS2062	Form Language	2	DE
		COMMUNICATION DESIGN		

2	DS2073	Advanced Graphic Design	1	DE
3	DS2083	Print Making	1	DE
4	DS2093	Product photography and studio lighting	1	DE
		INTERACTION DESIGN		
5	DS2103	Web and interaction	1	DE
		FILM & ANIMATION		
6	DS2113	Elements of film making	1	DE
7	DS2123	Script Writing	1	DE

Semester-IV				
Sn.	**Course Code**	**Course Title**	**Credit**	**Type**
1	DS2133	Design for Sustainability	2	DC
2	DS2143	Universal Design	2	DC
3	DS2153	Data and Information Visualization	2	DC
4	DS2163	Sound Design	1	DC
5	DS2175	Project 1	3	DC
6	XXXXXX	LA/CA	2	
7	XXXXXX	Free Electives	2	FE
8	XXXXXX	Department Electives	4	DE
		TOTAL	**18**	

Electives offered Semester-IV				
Sn.	**Course Code**	**Course Title**	**Credit**	**Type**
		PRODUCT DESIGN		
1	DS2183	Materials and Design	2	DE
2	DS2193	Computer-Aided Design	2	DE
		COMMUNICATION DESIGN		
3	DS2203	Publication Design	2	DE
4	DS3213	Branding and Identity	2	DE
		INTERACTION DESIGN		
5	DS2223	UI & UX	2	DE
6	DS2233	Creative coding	2	DE
		FILM & ANIMATION		
7	DS2243	Character Design	1	DE
8	DS2253	Advanced Animation	2	DE
9	DS2263	Film Editing	1	DE

Semester-V				
Sn.	**Course Code**	**Course Title**	**Credit**	**Type**
1	DS3080	Semiotics	1	DC
2	DS3093	AI in Design	2	DC
3	DS3105	Project 2	3	DC
4	XXXXXX	LA/CA	2	
5	XXXXXX	Free Electives	2	FE
6	XXXXXX	Department Electives	8	DE
		TOTAL	**18**	

Electives offered Semester-V				
Sn.	Course Code	Course Title	Credit	Type
		PRODUCT DESIGN		
1	DS3113	Embodiment Design	2	DE
2	DS3123	Applied Ergonomics	2	DE
3	DS3133	Nature and Form	2	DE
4	DS3143	Furniture Design	2	DE
		COMMUNICATION DESIGN		
5	DS3153	Type Design	2	DE
6	DS3163	Graphic Narratives	2	DE
7	DS3173	Way finding and Signage	2	DE
8	DS3183	Documentary photography	2	DE
		INTERACTION DESIGN		
9	DS3193	Digital storytelling	2	DE
10	DS3203	Digital Heritage	2	DE
11	DS3213	Design for education	2	DE
12	DS3223	Game design	2	DE
		FILM & ANIMATION		
13	DS3233	Animatics	1	DE
14	DS3243	Motion Graphics	2	DE
15	DS3253	Film Making	2	DE

Semester-VI				
Sn.	Course Code	Course Title	Credit	Type
1	DS3263	System Design	3	DC
2	DS3275	Project 3	3	DC
3	XXXXXX	LA/CA	2	
4	XXXXXX	Free Electives	2	FE
5	XXXXXX	Department Electives	8	DE
		Total	18	

Electives offered Semester-VI				
		PRODUCT DESIGN		
1	DS3283	Design Creativity and Innovation	2	DE
2	DS3293	Product Semantics	2	DE
3	DS3303	Lifecycle Analysis	2	DE
4	DS3313	Automobile Design Explorations	2	DE
		COMMUNICATION DESIGN		
5	DS3323	Spatial Design	2	DE
6	DS3333	Product graphics and packaging	2	DE
7	DS3343	Contemporary photography	2	DE
8	DS3353	Advertising	2	DE
		INTERACTION DESIGN		
9	DS3363	Tangible Computing	2	DE
10	DS3373	Service Design	2	DE

11	DS3383	Participatory Design	2	DE
12	DS3393	Virtual environments in design	2	DE
FILM & ANIMATION				
13	DS3403	Stop motion animation	2	DE
14	DS3413	Documentary film making	2	DE
15	DS3423	Visual Effects	2	DE
16	DS3433	Experimental Animation	2	DE

Semester-VII				
Sn.	**Course Code**	**Course Title**	**Credits**	**Type**
1	DS4030	Design Management and IPR	2	DC
2	DS4040	Professional Practice	2	DC
3	DS4050	Entrepreneurship and Business Planning	2	DC
4	DS4060	Design Research Seminar	2	DC
5	DS4075/4086	Project 4 / Internship (alt)	6	
6	XXXXXX	Free Electives	2	FE
		Total	**16**	

Semester-VIII				
Sn.	**Course Code**	**Course Title**	**Credits**	**Type**
1	DS4115	Final Project	12	DC
		Total	**12**	

1	Department Core	49
2	Department Elective	22
3	Projects/Internship	27
4	LA/CA	10
5	Free Electives	12
6	Basic Engineering	4
7	Language and Life skills	4
	Total	**128**

Department of Design
BDes 2020-21
Course Abstracts / Syllabus

(Semester -1)

DS1013: Elements of Design (3 Credits): The course will look at the building blocks of design such as space /point / line/ shape / value / texture / form /color. To understand perceivable and non-Perceivable elements of Design, Explorations on individual elements. It will also deal with Design Drawing - different types and techniques of drawing methods and visualization. Understanding of various art materials, usage and visualization techniques. It will offer an overview of basics of balance, rhythm, harmony, contrast, axis, scale, proportion, size, line, plane, volume, pattern, shape, size, space, texture and materials. Understanding form and functionality correlation. Material explorations in 2D using wire, paper, etc. Basic colour theories and application of color modes such as additive and subtractive colours, and different colour models. Application of colour and colour mixing.
(Hands-on course)

References:
- Riley, N., & Bayer, P. (2003). The elements of design: the development of design and stylistic elements from the Renaissance to the postmodern era. London, Mitchell
- Hannah, G. G. (2006). Elements of design: Rowena Reed Kostellow and the structure of visual relationships. New York, Princeton Architectural Press.
- Ways of Seeing, John Berger 1972, Published by BBC, Printed edition by Penguin Books
- ROWLAND, K. F. (1968). Looking and seeing Part 1-4. Aylesbury, England, Ginn.
- FEISNER, E. A., & REED, R. (2014). Color studies.
- CLELAND, T. M., BIRREN, F., & MUNSELL, A. H. (1977). A grammar of color. (A basic treatise on the color system of Albert H. Munsell.) Edited and with an introduction by Faber Birren. New York, etc, Van Nostrand Reinhold Co.
- Beazley.Design -The Key Concepts, Catherine McDermott, 2007, Routledge New York and London, Design Elements- Form and Space, Dennis M Puhalla, 2011, Rockport Publication.
- PEARCE, P., & PEARCE, S. (1980). Experiments in form: a foundation course in three-dimensional design. New York, Van Nostrand Reinhold.
- J. Bowers; Introduction to Two-Dimensional Design: Understanding Form and function, John Wiley & Sons, 1999

DS1063: Principles of Design (2 Credits): A course about various design principles such as rhythm, balance, contrast, symmetry, emphasis, harmony, unity. Explorations on individual elements with respect to different Principles, mediums and styles. Also an overview of Design Process with Basics of Design Methods, Various theoretical insights on methods, Empirical and Visual methods, Methodology for documenting collective Activity, Design research and its argumentative grammer.

References:
- DONDIS, D. A. (2000). A primer of visual literacy. Cambridge, MIT Press.
- DE SAUSMAREZ, M. (2011). Basic design the dynamics of visual form. London, A & C

Black.
- Design Things, A.Telier, 2011. (Thomas Binder, Giorgio De Michelis, Pelle Ehn, Giulio Jacucci, Per Linde, and Ina Wagner) The MIT Press, Cambridge, Massachusetts, London, Eng
- An Anthology of Theories and Models of Design, Philosophy, Approaches and Empirical Explorations, Amaresh Chakrabarti, Lucienne T. M. Blessing (eds.)- Springer-Verlag London (2014)
- Introduction to Product-Service-System Design, Tomohiko Sakao, Mattias Lindahl, Springer-Verlag London (2009)

DS1070: Evolution of Design (2 Credits): The course is an attempt to look at the history of design and major turning points that lead to what it is today. It also deals with the history of art and design from prehistoric to present. Understanding of design schools and key contributors for the evolution of design education and system.

References:
- Ocvirk, O. G. (2013). Art fundamentals: theory and practice. McGraw-Hill. NY
- Barth, F. G., GIAMPIERI-DEUTSCH, P., & KLEIN, H.-D. (2012). Sensory perception, mind and matter. Wien, Springer.

DS 1020: Design, Culture and Society (2 Credits): This course aims to employ the framework of design to look at social and cultural systems and practices. It also locates design as an evolutionary process within the social and cultural milieu. The course intends to bring out, both the self-organised and the intentional dimensions of Design.

References:
- De Landa, M (2016), Assemblage Theory, Edinburgh University Press
- De Landa, M (2015), Philosophical Chemistry: Genealogy of a Scientific Field, Bloomsbury
- Cache, B (2011), Projectiles, Architectural Association Publications

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DS1130: Film Appreciation (1 Credit): This course intends to practically help participants to read a film beyond its on-screen meaning to understand its creative structure through the intentions of its makers and their effort. The course will give them a first-hand introduction on cinematic elements such as narrative, mise-en-scene, editing, cinematography and sound to help them understand how their sum contributes to the whole experience.

References:
- Ray, Satyajit: Our films Their films, 2010, Orient Black Swan
- Monaco, James: How to read a film, 2000, New York, NY: HEP
- Barthes, Roland: Rhetoric of the image, 1977
- Sharff, Stefan: The elements of cinema, 1982, Columbia University Press
- Barnwell, J: The fundamentals of film making, 2008, Lausanne: AVA Academia.

(Semester -2)

DS1113: Basic Product Design (2 Credits)- Design philosophy, Products, Product Design Process. Brief overview of morphology of Design, Phases in Design cycle, Identification of needs, conceptual design, Concept generation, screening, scoring, detail design, Design for manufacturing and Assembly (DFMA), product economics

References:
- Product Design and Development (2004) K T Ulrich & S D Eppiger
- Product Design By K Wood and Otto

DS1123: Basic Animation (2 Credits): This course introduces to the principles of animation and how to physically achieve it using classic animation methods. The participant is also introduced to diverse techniques and materials in animation such as claymation, sand animation, stop motion etc. The course can extend to designing characters for animation.

References:

- Thomas, Frank. The illusion of life: Disney Animation. Disney Editions 1995
- Glebas, Francis. Directing the Story: Professional Storytelling and Storyboarding Techniques for Live Action and Animation. Focal Press 2008
- Kenworthy, Christopher. Master Shots. Michael Wiese Productions 2012
- Betancourt, Michael. The History of Motion Graphics by. Wildside Press 2013 Shaw, Austin. Design for Motion: Fundamentals and Techniques of Motion Design. Routledge 2015

DS1173: Basic Photography (2 Credits): The course introduces you to the powerful medium of photography, the technical aspects related to the equipment and delivery of the content. It introduces to studio photography using artificial lights and street photography in natural light. It also introduces to composition and various storytelling techniques in photography.

References:
- Michael Langford (Author), Anna Fox (Author, Editor), Richard Sawdon Smith (Author, Editor).
- Langford's Basic Photography: The Guide for Serious Photographers. Focal Press 2010
- The New manual of Photography by John Hedgecoe

DS1153: Basic Interaction Design (1 Credit): An introductory course in interactive media and its possibilities to students of any background. How content can be generated, effectively create the information architecture and user experience in the digital medium.
References:

- Gibson, J. J. (1977). The theory of affordances. In R. E. Shaw & J. Bransford (Eds.), *Perceiving, Acting, and Knowing.* Hillsdale, NJ: Lawrence Erlbaum Associates.

- Norman, D. A. (1988). The psychology of everyday things. New York: Basic Books.
- Norman, D. A. (2013). The design of everyday things: Revised and expanded edition. New York: Doubleday.

DS1163: Basic Graphic Design (2 Credits): The course introduces to the building blocks of visual communication, typography and graphics. Basic Graphics introduces abstracting visual information in the form pictograms, icons etc and together with typography it can create visual experience.

References:

- Heller, Steven. Vienne, Veronique. 100 Ideas that Changed Graphic Design. Laurence King Publishing 2012
- Heller, Steven. Ilic ,Mirko. The Anatomy of Design: Uncovering the Influences And Inspirations in Modern Graphic Design. Rockport Pub 2007
- Abdullah, Rayan. Hübner, Roger. Pictograms, Icons & Signs: A Guide to Information Graphics. Thames and Hudson 2006
- Ross, John. The Complete Printmaker: Techniques, Traditions, Innovations. Free Press 1991

(Semester -3)

DS2012: Illustration and Drawing (2 Credits): The course introduces to the powerful medium of illustration which is an integral part of the visual communication. It exposes to the diverse uses and styles of the medium to create powerful content in various media from editorial content, children's books, storyboarding, animation, graphic novels and many more.

References:
- Doyle, S., Grove, J. and Sherman, W. (n.d.). History of illustration.
- Heller, S. and Arisman, M. (2004). Inside the Business of Illustration. New York: Constable & Robinson.

DS2023: Basic Typography (2 Credits): Typography is a specialized profession. In all settings such as static, dynamic or kinetic, a knowledge of typographic fundamentals is a key for effective communication. This course is aimed to introduce the fundamentals of letterforms and typographic practice to the students through progressive assignments. It motivates students to explore the theoretical and applied use of type and grid system as an integral part of visual communication.

Objectives:
To have a historical look at lettering and typography: Understanding the evolution of type design, type classification and typography.
1. Understanding the natural form of typeface and its anatomy.
2. Introduction to the formal elements of typography such as typeface, hierarchy, contrast, consistency, alignment, white space, and color.
3. Understanding the grid system and layout design.

4. A brief intro to the fundamentals of applied typography across applications.

References:

- Ambrose, G., & Harris, P. (2005). Basic Design: Typography and the arrangement, style and appearance of type and typefaces. Singapore: AVA Publishing SA.
- Ambrose, G., & Harris, P. (2011). The Fundamentals of Typography. AVA Publishing SA.
- Bringhurst, R. (2004). The Elements of Typographic Style. Point Roberts, WA: Hartley & Marks.
- Carter, R., Meggs, B. P., Day, B., Maxa, S., & Sanders, M. (2015). Typographic Design: Form and Communication. Hoboken, New Jersey: John Wiley & Sons, Inc.
- Elam, K. (2004). Grid Systems: Principles of Organizing Type. Princeton Architectural Press.
- Haley, A., Poulin, R., Tselentis, J., Seddon, T., Leonidas, G., Saltz, I., . . . Alterman, T. (2012). Typography Referenced: A Comprehensive Visual Guide to the Language, History, and Practice of Typography. Rockport Publishers.
- Kastl, J. A., & Child, L. I. (1968). Emotional Meaning of four Typographical Variables. Journal of Applied Psychology, 52(6), 440-446.
- Koch, E. B. (2011). Human emotion response to typographic design. The Faculty of the Graduate School of the University of Minnesota.
- Lawson, A. (1990). Anatomy of A Typeface. London: Hamish Hamilton.
- Lewis, J. (2007). Typography: Design and Practice. Jeremy Mills Publishing.
- Lupton, E. (2010). Thinking with Type: A Critical Guide for Designers, Writers, Editors and Students. New York: Princeton Architectural Press.
- Meggs, B. P. (1992). Type & Image: The Language of Graphic Design. New York: Van Nostrand Reinhold.
- Spiekermann, E. (1993). Stop Stealing Sheep & Find Out How Type Works. Adobe Press.
- Strizver, I. (2014). Type Rules: The Designer's Guide to Professional Typography. New Jersey: John Wiley & Sons, Inc.
- Tselentis, J. (2011). Type, Form & Function: A Handbook on the Fundamentals of Typography. Massachusetts: Rockport Publishers, Inc.
- Willen, B., & Strals, N. (2009). Lettering & Type: Creating letters and Designing Typefaces. New York: Princeton Architectural Press.

DS2033: Introduction to Ergonomics (2 Credits): Man Machine Interface, Anthropometry - techniques to measure anthropometric dimensions, and other attributes like vision and force parameters, Displays and Controls, Perceptual and Cognitive aspects in design, Sensory abilities, information processing, response limitations, physical/physiological limits, workplace evaluation.

References:

Salvendy, G. (2013). *Handbook of human factors and ergonomics*. Hoboken, N.J.: Wiley.

DS2043: Programing for Designers (1 Credit): This course expose to the basic building blocks of creating a digital experience. Learning HTML and coding is an essential component to understand the possibilities and limitations of the medium, for the designer to optimise user experience in digital medium.

References:

- Duckett, Jon. HTML and CSS: Design and Build Websites. John Wiley & Sons, 2011
- Casey Reas, Ben Fry. Getting Started with Processing: A Hands-On Introduction to Making Interactive Graphics Maker Media, Inc., 2015

DS2053: Storyboarding (2 Credits): The medium of illustration to create/ plan visual sequences/ narratives for a diverse set of media from graphic novels, animation to film. It takes into consideration the characters and their interaction with space/ environment and light.

References:
- Rousseau, D. and Phillips, B. (2013). *Storyboarding essentials*. New York: Watson-Guptill Publishers.

List of Electives (Semester -3)

DS2062: Form Language, (2 Credits) (Design Minor) - Product form evolution, analogy and case studies. Cross referencing of form derivations from famous designers and architects and its morphology. Case example studies of contemporary designers and their uniqueness and identity analysis of their designs. Cross-referencing and cross-breeding of design language with materials. An unique approach of understanding form.

References
- J. Bowers; Introduction to Two-Dimensional Design: Understanding Form and function, John Wiley & Sons, 1999
- Lauer, David; Design Basics, Wadsworth Publishing, 1999
- Gail Greet Hannah, Elements of Design, Princeton Architectural Press, 2002
- J. Bowers; Introduction to Two-Dimensional Design: Understanding Form and function, John Wiley & Sons, 1999

DS2073: Advanced Graphic Design (1 Credit): This course extends to create powerful imagery merging text and images for a variety of visual media from print to digital.

References:
- Heller, Steven. Vienne, Veronique. 100 Ideas that Changed Graphic Design. Laurence King Publishing 2012
- Heller, Steven. Ilic ,Mirko. The Anatomy of Design: Uncovering the Influences And Inspirations in Modern Graphic Design. Rockport Pub 2007
- Abdullah, Rayan. Hübner, Roger. Pictograms, Icons & Signs: A Guide to Information Graphics. Thames and Hudson 2006

DS2083: Print Making (1 Credit): The course will aim to provide an overview of Printing processes in both traditional and modern forms. The scope of printmaking is vast. An introduction to various

techniques and mediums like Screen-printing, mixed media, Lithography, Etching, Wood cut, relief printings, Xerox art etc.

References:
- Frances Stanfield, Lucy McGeown . The Printmaking Ideas Book. Ilex Press; 2019
- Sylvie Covey. Modern Printmaking: A Guide to Traditional and Digital Techniques. Watson-Guptill, 2016

DS2093: Product Photography and Studio Lighting (1 Credit): This course takes a deeper look at aspects of artificial lighting in a studio setup to shoot products and people.

References:
- Thomas, J. (n.d.). The art and style of product photography.

DS2103: Web and Interaction (1 Credit): An introductory course in interactive media and its possibilities to students of any background. How content can be generated, effectively create the information architecture and user experience in the digital medium.

References:
- Levin, M. (2018). Designing Multi-Device Experiences. O'reilly
- Nagel,Wolfram (2015). Multiscreen UX Design: Developing for a Multitude of Devices. Morgan Kaufmann
- Peterson, Clarissa. Learning Responsive Web Design: A Beginner's Guide. O'Reilly Media, Inc.2014

DS2113: Elements of Film Making (1 Credit): The course introduces to the elements that make up the film such as creating script, storyboarding, art direction, cinematography, lighting, sound, editing etc. It introduces to the technical aspects through hands-on experience in each of these elements.

References:

- Monaco, James: How to read a film, 2000, New York, NY: HEP
- Barthes, Roland: Rhetoric of the image, 1977
- Sharff, Stefan: The elements of cinema, 1982, Columbia University Press
- Barnwell, J: The fundamentals of film making, 2008, Lausanne: AVA Academia

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DS2123: Script Writing (1 Credit): The course introduces the basic elements of script writing such as Scene Heading, Action, Character Name, Parenthetical, Extension, Transitions and Shots. These attributes that give a film script text the format and consistency expected to be understood by all participants.

References:
- Snyder, B. (2005). Save the Cat! The Last Book on Screenwriting You'll Ever Need, Michael Wiese Productions
- Vogler, C. & Montez, M. (2007). The Writers Journey: Mythic Structure for Writers, 3rd Edition, Michael Wiese Productions

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(Semester -4)

DS2133: Design for Sustainability (2 Credits): The course intends to offer in-depth understanding and extensive analytical ability to map/assess LCA of products and reverse engineer design and manufacturing processes in order to minimize impacts and emissions.

References:
- C. Vezzoli, System Design for sustainability. Theory, methods and tools for a sustainable satisfaction system/design, Rimini: Maggioli edition, 2007
- C. Vezzoli and E. Manzini, Design for Environmental Sustainbility, Springer - Verlag, London, 2008
- L. Nin and C. Vezzoli, Designing Sustainable Product-Service System for all. Milan: Libreria, CLUP, 2005

DS 2143: Universal Design (2 Credits): As per definition, Universal Design is the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability. The course is an attempt to understand the need for such services, products and environments and design and innovate for the same.

References:
- Steinfeld, Edward. Maisel. Jordana. Universal Design: Creating Inclusive Environments. Wiley, 2012
- Cherie Lebbon, John Clarkson, Roger Coleman, and Simeon Keates. Inclusive Design: Design for the Whole Population. Springer Science & Business Media, 2003
- Keates, Simeon L., Clarkson, John.Countering Design Exclusion: An Introduction to Inclusive Design. Springer 2004
- Roger Coleman, John Clarkson, Julia Cassim. Design for inclusivity: A Practical Guide to Accessible, Innovative and User-Centred Design. Routledge

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DS2153: Data and Information Visualization (2 Credits): We are living in the age of information explosion. Designers can play an active role in making the huge volume of information intelligible to users. The objectives of the course are to understand the increasing quantity and complexity of data and information produced, to filter information, organize, represent, establish relationships and discern patterns, to develop inspiring and stimulating solutions to contextualize information that simultaneously inspire, inform, entertain and even encourage critical thinking.

References:
- Tufte, Edward. Beautiful Evidence. Graphics Press, 2006
- Tufte, Edward. Visual Explanations: Images and Quantities, Evidence and Narrative. Graphics Press, 1998
- Tufte, Edward. Envisioning Information. Graphics Press, 1990
- Tufte, Edward. The Visual Display of Quantitative Information. Graphics Press, 1983

DS2163: Sound Design (1 Credit): The objective of this course is to introduce students to the process of recording, acquiring, manipulating or generating audio elements for diverse fields such as animation, advertising, film, performances, experiences etc.

References:
- Farnell, Andy. Designing Sound. MIT press 2010
- Scott-James, Kahra. Sound Design for Moving Image: From Concept to Realization. Bloomsbury 2018

List of Electives (Semester -4)

DS2183: Materials and Design (2 Credits): Introduction to traditional and new materials. Understanding of basic hand tools and simple machinery. Knowledge on usage, methods and techniques to achieve specific results. Hands on experience of sequential processes by explorations of different types and properties of material. Characterization, Testing and Selection of Materials like: Metals, wood, plastics, ceramics, Composite materials for different applications. Manufacturing processes using these materials.

References:
- M F. Ashby, K Johnson, Materials and Design: The Art and Science of Material Selection in Product Design, Butterworth-Heinemann, Elsevier Publishers, 2011
- V Raghavan, Materials Science and Engineering: A First Course, 6th Revised Edition, Prentice Hall India Learning Private Limited, 2015

DS2193: Computer Aided Design (2 Credits): Introduction to mathematical Elements of CAD, Geometric Modeling in CAD, Curves, - Cubic, Bezier, and B-Spline curves, Surfaces, Ruled surface, Solid Modeling, B-Rep, Feature based Modeling, Generative Modeling, Graphical Elements in CAD, Devices, and Interactions for CAD, Visual rendering pipeline, Shading, Lighting, Materials

References
- D. F. Rogers, J .A. Adams, Mathematical Elements for Computer Graphics, McGraw-Hill Publishing, 1976
- D. D. Hearn, M. P. Baker and W. Carithers, Computer Graphics with Open GL (4th Edition), Pearsons Publications, 2010

DS2203: Publication Design (2 Credits): Extending the exposure in typography and graphics to create strong publications in print media in the form of magazines, newspapers and books. It introduces to the composition and layout of these publications. The course can extend to its applications in digital media.

Reference:
- Lupton, E. (2014). *Thinking with type*. New York, NY: Princeton Architectural Press.
- Josef Mülller-Brockmann. *Grid Systems in Graphic Design: A Visual Communication Manual for Graphic Designers*. Antique Collectors Club (1999)

DS3213: Branding and Identity Design (2 Credits): The course objective is to understand brand strategies, market and to learn how to create strong identity design/ logos, print ads, stationery, business cards, that support and enhance the brand with the aid of various graphic applications and communicate the brands message to a larger audience.

References:
- Wheeler, Alina. Designing Brand Identity: An Essential Guide for the Whole Branding Team. John Wiley & Sons, 2012
- Klein, Naomi. No Logo. Fourth Estate 2010
- Millman, Debbie. Brand Thinking and Other Noble Pursuits. Skyhorse Publishing Inc., 2011

DS2223: UI & UX (2 Credits): The course introduces to various types of user interfaces and its user experiences. The course allows the students to ideate and create newer models of user interfaces for usability, accessibility and sensory experience.

References:
- Norman, Don. The design of everyday things: Revised and expanded edition. Basic books, 2013.
- Weinschenk, Susan. 100 things every designer needs to know about people. Pearson Education, 2011.
- Moggridge, Bill, and Bill Atkinson. Designing interactions. Vol. 17. Cambridge, MA: MIT press, 2007.
- Saffer, Dan. Microinteractions: designing with details. " O'Reilly Media, Inc.", 2013.

DS2233: Creative Coding (2 credits): The goal is to create visually expressive and experimental digital experiences to create games, entertainment, art installations, projections, sound art, advertising, tangible experiences, product prototypes, and much more.

References:
- Casey Reas, Ben Fry. Getting Started with Processing: A Hands-On Introduction to Making Interactive Graphics Maker Media, Inc., 2015

- Shiffman, Daniel. Learning Processing: A Beginner's Guide to Programming Images, Animation, and Interaction. Newnes, 2015

DS2243: Character Design (1 Credit): Design is considered as an important storytelling tool. The course highlights different aspects of designing and studying a character for illustration, animation, film, games, graphic narratives and web design. The course includes explorations of multiple illustration styles.

References:
- Matessi**,** M. (2012). Force: Character Design from Life Drawing, Taylor & Francis Publisher
- Cai, R. Gerard, J. Harris, N. Croes, B. & Puebla, R. (2014). Beginner's Guide to Sketching: Characters, Creatures and Concepts, The Writers Journey: Mythic Structure for Writers, 3rd Edition, Sixth&Spring Books

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DS2253: Advanced Animation (2 Credits): The Principles of Animation require practice for an animator to develop skills in this field. This course extends the basic principles used in areas such as Walk cycles, Animal movements, Morphing, Speech and Dialogues, Acting, etc

References:
- Williams, R. (2001). The Animator's Survival Kit, Faber and Faber
- Thomas, F. & Johnston, O. (1981). Disney Animation: The Illusion of Life, Abbeville Press

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DS2263: Film Editing (1 Credit): Film Editing is a creative as well as technical part of the post-production process of filmmaking. This course involves the activity of selecting scenes to be shown and arranging them together in a sequence with the use of timing to create a film.

References:
- Ichac, M. Roubaix, P. (Producers), **Enrico, R**. (Director), Bierce, A. (Writer). (1962). *An Occurrence at Owl Creek Bridge* **(Short Film). France.**
- Borderie, R. (Producer), Clouzot, H (Director). (1953). *The Wages of Fear* (Feature Film). France, Italy. Distributors Corporation of America (US). Criterion Collection (1999 DVD release)

(Semester -5)

DS3080: Semiotics (1 credit): Introduction to Semiotics elaborate on signs and symbols, as they communicate things spoken and unspoken. Its relevance in design and at large in culture and society will be discussed.

References:
- Chandler, Daniel. Semiotics: The Basics. Routledge, 2017
- Eco, Umberto. .A Theory of Semiotics. Macmillan, 1977

● Barthes, Roland. Elements of Semiology. Hill and Wang. 1977

DS3093: AI in Design (2 credits): The course gives a broad perspective on applications of artificial Intelligence to advanced computer based design systems. Applications of techniques like Machine learning, Rule based systems, expert systems, Natural Language Processing in the context of Design. Design generation, analysis and Interpretation through expert systems.

References:
- Russell, Stuart J., and Peter Norvig. *Artificial intelligence: a modern approach*. Malaysia; Pearson Education Limited,, 2016.
- Bentley, Peter. *Evolutionary design by computers*. Morgan Kaufmann, 1999.

List of Electives (Semester -5)

DS3113: Embodiment Design (2 Credits): The course is intended to develop understanding about the functional embodiment of the intended behavior. This also involves integration of multiple domains.

Course Outline: Mechanism Design: Synthesis of mechanisms, Four-bar Mechanisms, Motion synthesis, Couplar curve synthesis, Rigid Body Guidance, Gears and Cams, Force Analysis. Arduino Programming, Introduction to AI.
References:
- K. J. Waldron, and G. L. Kinzel, Kinematics, Dynamics, and Design of Machinery, Wiley Publications, 2003
- A G. Erdman, G N. Sandor, Mechanism design: analysis and synthesis, Volume 1 and 2, Prentice-Hall, 1984x
- Michael Margolis, Arduino Cookbook, 2nd Edition, O'Reilly Media, Inc. 2011.
- Philip C. Jackson, Introduction to Artificial Intelligence: Second, Enlarged Edition, Dover Books, 2013

DS3123: Applied Ergonomics (2 Credits): The course intends to give an in-depth understanding of how the field of ergonomics can be applied in different design scenarios. How new techniques and digital technologies have influenced the practice of ergonomic studies. Industrial case studies will be discussed. A course project is carried out to apply the methods discussed in the real life scenario.
Course Outline: Human Senses, Vision, touch, Auditory feedback, Applied Anthropometry, Strength performance parameters, Force, Torque, Reach parameters. Visual Search, Visibility, legibility, Digital Techniques in anthropometry: Photogrammetry; Laser scanning for anthropometric data collection, Size India project. Eye-tracking, Digital Human Modeling, Human Machine Interactions, Errors, Workplace Design,
References:
- M. S. Sanders and E. J. McCormick, Human Factors In Engineering and Design, McGraw-Hill Publications, 1993
- R.S Bridger, *Introduction to Ergonomics*, McGraw-Hill Inc., 1995.
- D. Chakrabarti, *Indian Anthropometric Dimensions for Ergonomic Design Practice*, National Institute of Design, Ahmedabad, 1997

DS3133: Nature and Form (2 Credits): Nature has the largest pool of perfectly working resources of all types. Course intends to take nature based inspirations and explore for possible design solutions in various needs. Fundamentals of principles of design found in nature. Explorations in form, function and mechanism would be the major drive. Nature based design principles such as golden ratio, etc. and case examples of works of famous designers and architects.

References:
- J. Bowers; Introduction to Two-Dimensional Design: Understanding Form and function, John Wiley & Sons, 1999
- Proctor, R.M.; The principles of pattern, Dover Publications, 1990
- Rudolf Steiner, David Booth; The Fourth Dimension: Sacred Geometry, Alchemy, and Mathematics, Steiner Books, 2001

DS3143: Furniture Design (2 Credits): First module will expose students to furniture as an integral part of facility and comfort to humankind. To study famous furniture designers and their works from across the world. Art and craft movements and their influences on furniture design. Contemporary interpretations of furniture design using new age materials and themes of design.

Second module will undertake a furniture design exercise with concept brief, interpretation and functionality, etc. The course delivery will be in the form of a design, build, and finish design project in our workshop. While doing this, an overview of tools and materials, joinery, furniture making techniques, hand tools, finishing, will be delivered. The machining and other workshop techniques and handling will be done in collaboration with the Materials course also.

References
- Postell, J.(2012). Furniture Design. New Jersey: John Wiley & Sons, Inc. ISBN 9781118090787
- Cranz, G.(1998). The Chair: Rethinking Culture, Body, and Design. New York: W.W. Norton & Company, Inc. ISBN 0393046559
- Hemachandra, R.(2008). 500 Chairs: Celebrating Traditional and Innovative Designs (500 Series). Lark Books. ISBN 1579908721
- Miller, J.(2007). Chairmaking and Design. (2nd Ed.) Linden Publishing. ISBN 1933502061
- Savage, D.(2011). Furniture with Soul: Master Woodworkers and their Craft. Kodansha USA. ISBN 4770031211
- Tilley, A.R., Henry Dreyfuss Associates (2002). The Measure of Man and Woman: Human Factors in Design. New York: John Wiley & Sons, Inc. ISBN 0471099554.

DS3153: Type Design (2 Credits): The course extends to understand character of fonts in detail to create new fonts for a variety of media and in different languages.

References:
- Bringhurst, Robert. The Elements of Typographic Style. Hartley & Marks Publishers 1992
- Tschichold. Jan, Hendel, Richard. The New Typography. University of California Press 1995

DS3163: Graphic Narratives (2 Credits): Graphic narratives offers an intricately layered narrative language that comprises of verbal and visual interaction on a page. This course highlights the creative process of developing a graphic narrative.

References:
- Chute, H. L., & DeKoven, M. (2006). Introduction: Graphic Narrative. MFS Modern Piction Studies 52(4), 767-782.
- Spiegelman, A. (1991), Maus, Pantheon Books

DS3173: Way Finding & Signage (2 Credits): Signage is the design or use of signs and symbols to communicate a message to a specific group. It is a scheme of way-finding tools that will help a user navigate within his choice of parameters and enable him to address the issues of finding any destination. This course aims to provide a basic understanding and an overview of Signage system design. The course shall also be exploring various kinds of way finding signage's such as Identification, Directional, Regulatory, and Informational with an extended understanding of how to create a well-structured path through visual and verbal cues through a structured design process involving case studies.

References:
- Andreas Uebele (2007). Signage & Information graphics. London: Thames & Hudson
- Chris Calori (2007). Signage and Wayfinding Design: A Complete Guide to Creating Environmental Graphic Design Systems. Wiley
- Henry Dreyfuss (1984). Symbol Sourcebook: An Authoritative Guide to International Graphic Symbols. Wiley
- Symbol signs: The system of passenger/pedestrian oriented symbols developed for the U.S. Department of Transportation (Visual communication books) by American Institute of Graphic Arts (1981). Hastings House
- Rudolf Modley, William R. Myers, Diana G. Comer (1976). Handbook of Pictorial Symbols (Dover Pictorial Archive Series). Dover Publications
- Miranda Bruce-Mitford (1996). Illustrated Book of Signs & Symbols. Dorling Kindersley Publishing
- Carl G. Liungman (1994). Dictionary of Symbols. W. W. Norton & Company
- Todd Pierce (1997). The International Pictograms Standard. Watson-Guptill Publications
- Phil Baines, Catherine Dixon (1998). Signs: Lettering in the Environment: Lettering in the Environment. Watson-Guptill Publications
- Adrian Frutiger, Andrew Bluhm (Translator) (2003). Signs and Symbols: Their Design and Meaning. Harper Design

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DS3183: Documentary Photography (2 Credits): This course is a hands on experience through taking challenging topics from society and visually documenting through photography. It includes research and understanding of social circumstances, how to approach stakeholders and effectively tell a visual narrative.

References:

- Salgado, S. (n.d.). Sebastião Salgado - workers. New York: Aperture Foundation.
- Chéroux, C. (n.d.). *Magnum Manifesto*.

DS3193: Digital Storytelling (2 Credits): How information can be represented and narrated in the age of digital experience for a variety purposes from education to journalism. Convergence of media in digital platforms have made it challenging for designers to create sustaining story experiences in digital media. The course intends to create compelling narratives using possibilities of multimedia in digital world.

References:
- Jonathan Gottschall. The Storytelling Animal: How Stories Make Us Human. Houghton Mifflin Harcourt, 2013
- Alexander, Bryan. The New Digital Storytelling: Creating Narratives with New Media. ABC-CLIO, 2017

DS3203: Digital Heritage (2 Credits): The physical experience obtained when people visit the monuments, will be translated to the digital medium and the aim is to recreate the digital experience much nearer to the original experience of the physical monument. And to create a knowledge base for the future, parallely communicating the form, style, design, culture and history to next generation. This is achived by using hiend technology like photogrammatry, laser scanning, 360 photography and high resolution photography.

References:
- V. La Rosa, La "Villa Royale" d'Haghia Triada. in R. Hgg (ed.), The Function of the "Minoan Villa," Astrom editions, 1997.
- V. La Rosa, "Il Colle sul quale Sorge la Chiesa ad Ovest `e tutto Seminato di Cocci." Vicende e Temi di uno Scavo di Lungo Corso, in Creta Antica, vol. 4, pp. 11–68, 2003.
- D. Tanasi, "Chapter 9. A Late Bronze Age Upland Sanctuary in the Core of Sikania?," in M. Fitzjohn (ed.), Uplands of Ancient Sicily and Calabria. The archaeology of landscape revisited, Accordia Specialist Study on Italy, vol. 13, pp. 157–170, 2007.
- D. Palermo, E. Pappalardo, and D. Tanasi, "Le Origini di un Santuario," in Atti del convegno di studi EIS EKRA. Insediamenti d'altura in Sicilia dalla preistoria al III secolo a.C., pp. 47–78, 2008.
- R. P. C. Guzzone, D. Palermo, Montagna di Polizzello. Campagna di Scavo 2004. Betagamma Editrice, Viterbo.

DS3213: Design for Education (2 Credits): The course looks at intervention through design tools, thinking and pedagogical methods to improve education. Creating innovative methods to make education fun for all. Analogue and digital methods are explored.

Reference:
- Lupton, Ellen. Design is storytelling. Cooper Hewitt, Smithsonian Design Museum (November 21, 2017)

- Birks, Kimberlie. Design for Children. Phaidon Press(2018)
- Gelman, Debra Levin. Design for Kids: Digital Products for Playing and Learning. Rosenfeld Media; 1st edition (July 15, 2014)

DS3223: Game Design (2 Credits): This course deals with the art of applying design and aesthetics to create a *game* for entertainment, educational, or experimental purposes.

References:
- Schell, J. (2006). The Art of Game Design: A Book of Lenses. Morgan Kaufmann Publishers
- Tekinbas, K. & Zimmerman, E. (2003), Rules of Play: Game Design Fundamentals, MIT Press

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DS3233: Animatics (1 Credit): An Animatic is an Animated Storyboard. It is a preliminary version of a film, produced by shooting successive sections of a storyboard and adding a soundtrack.

References:
- Williams, R. (2001). The Animator's Survival Kit, Faber and Faber
- Thomas, F. & Johnston, O. (1981). Disney Animation: The Illusion of Life, Abbeville Press

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DS3243: Motion Graphics (2 Credits): This course focuses on giving movement to graphic design elements by adding motion. Motion Graphics can be effectively used in Explainer Videos, Logo Animation, Applications, Mixed Reality Experiences, Interactive Installations, Credit Sequences of Films, Digital Marketing, Advertising, Web Graphics, GIF's, Presentations and more.

 References:
- Williams, R. (2001). The Animator's Survival Kit, Faber and Faber

- Shaw, A. (2015). Design for Motion: Fundamentals and Techniques of Motion Design, Routledge

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DS3253: Film Making (2 Credits): The course is a practical application of the elements that make up the film such as creating script, storyboarding, art direction, cinematography, lighting, sound, editing
 etc. How planning, costing and production work from scratch to create stories on screen.

References:
- Sharff, Stefan: The elements of cinema, 1982, Columbia University Press
- Barnwell, J: The fundamentals of film making, 2008, Lausanne: AVA Academia.

(Semester -6)

DS3263: System design (3 Credits): The course aims to see the design process as the sum of several connections between elements, events or entities and how they influence each other. System thinking equips participants to see the cause and effect of each action on individual elements for better and sustainable solutions for society.

References:
- Meadows, Donella H. Thinking in systems: A primer. chelsea green publishing, 2008.
- Gall, John. The systems bible: the beginner's guide to systems large and small. General Systemantics Press, 2002.

List of Electives (Semester -6)

DS3283: Design Creativity and Innovation (2 Credits) Design Minor - Today's economy is an experiential economy where available designs are in competition. How to standout and survive? The efficiency is needed at all levels of the design and delivery using creativity and innovation. Translating the creative prowess into a real design delivery is the key today. Students will be given with thinking processes to come up with creativity in design stages. The expressiveness has to be unique and fitting in the mould of consumer insights, manufacturing, operations, disposal, economic and social relevance, etc. Design Thinking will be delivered to enable students ingenious solutions.

References
- Kelly Tom: The Art of Innovation, doubleday, NY , 2001
- Cagan, Jonathan; Vogel, Craig M.; Creating Breakthrough Products: Innovation from Product Planning to Program Approval, Publisher: Financial Times Prentice Hall; 2002
- Kumar, Vijay., 101 Design Methods: A Structured Approach for Driving Innovation in Your Organization. Wiley; 1 edition, 2012

DS3293: Product Semantics (2 Credits) Design Minor: The course is intended to build a broad understanding of the interactions and behavior of the users with products through which they explore the associated meanings. By understanding this process, the designers can craft unique experiences.
Course Outline: Introduction to semantics. Sign, symbol, index, Cognition and emotional aspects of Design, Semantic Transfer, Affordance, Principles of Product Semantics: Gestalt, Shape and form, Color, Materials. Understanding User Behavior. Cultural issues in Design.

References:
- Klaus Kippendorff, The Semantic Turn: A New foundation for Design, CRC Press, 2005
- Don Norman, The Design of Everyday Things, MIT Press, London, 1982.
- Dalgleish and Power (Ed.), Handbook of Cognition and Emotions, Wiley, 1992
- Other selected Publications will be given in the class

DS3303: Life Cycle Analysis (2 Credits) Design Minor: An attention towards environmental impact consideration wrt to a product / service / system has become imperative in increasingly degrading environment today. Hence a sustainable model of manufacturing / service has been accepted as

ultimate goal. All aspects around it has come under scrutiny and methods are being devised to address them. Industrial revolution brought consumerism however it has resulted into a climate change nightmare. Conventional regulations cater to only emissions / pollution by a product but in recent times impact has been noticed on several other aspects of ecosystem. Hence a Lifestage based impact assessment is needed. Manufacturing processes are adopting to LCA referenced methods to improve on impacts.

References
- S. Ramachandra Rao, in Waste Management Series, 2006
- Wanner Bulletin 46, 1995
- Salah M. El Haggar, in Environmental Solutions, 2005
- Gerald Jonker, Jan Harmsen, in Engineering for Sustainability, 2012

DS3313: Automobile Design Explorations (2 Credits) Design Minor: The course intends to deliver skills of visualization and design delivery for the need of mobility. Utilizing core subject knowledge competence with creative blend for automobile design and development of mobility solutions across personal to mass transportation. Elements of engineering, anthropometry, ergonomics, alternative energy systems, materials and styling would be used to amalgamate and come up with innovative ideas to address complex requirements. The course embraces the design and development process by user research, scenario study, applying new materials, utilizing cutting edge technologies to address the changing paradigm. Explorations and design process would be emphasized to come up with fresh ideas in initial stage. Further student would move to solve comfort, functional, safety and technical requirements and refine the design in physical and digital mediums for a final design solution. It is a challenging process to achieve good design and would require in-depth attention towards development of form, function and innovation for achieving future-ready rewarding mobility solutions. Lectures would be supported by hands-on exercises, field study, research and model making.

References
- Hannah, Gail Greet; Elements of Design, Princeton Architectural Press, 2002
- Rouse, William B.; Design for Success: A Human Centered Approach to Designing Successful Products and
- Systems. Wiley-Interscience; 1991.
- Julian Happian-Smith, Transport Research Laboratory (TRL) Introduction to Modern Vehicle Design. Elsevier, 2001.
- Beverly R. Kimes: Pioneers, Engineers, and Scoundrels: The Dawn of the Automobile in America. SAE International. 2004

DS3323: Spatial Design (2 Credits): Designing a conscious, pleasant environment in public and private spaces considering all aspects of sustainable practices in Space, Architecture and horticulture.

References:
- Tukker, Arnold, Martin Charter, Carlo Vezzoli, Eivind Sto, and Maj Munch Andersen, eds. System Innovation for Sustainability: Volume 1:Perspectives on Radical Changes to Sustainable Consumption and Production.Greenleaf Publishing, 2007

- Tischner, Ursula, Eivind Sto, Unni Kjaernes, and Arnold Tukker, eds.System Innovation for Sustainability 3: Case Studies in Sustainable Consumption and Production - Food and Agriculture. Greenleaf Publishing,2009
- Lahlou, Saadi, ed. System Innovation for Sustainability 4: Case Studies in Sustainable Consumption and Production Energy Use and the Built Environment. Greenleaf Publishing, 2010
- Dougherty, Brian, and Celery Design Collaborative. Green Graphic Design. 1 edition. New York, NY: Allworth Press, 2008. 6. Braungart, Michael, and William McDonough. Cradle to Cradle. Vintage,2009
- Braungart, Michael, and William McDonough. Cradle to Cradle. Vintage,2009

DS3333: Product Graphics and Packaging (2 Credits): This course intends to expose to various packaging techniques and push further to create sustainable packaging practices for future. The course also expands to packaging presentation through product graphics for retail and other environments.

References:
- Ibbotso ,Tony, Chong,Peng.Eco Packaging Now. Images Publishing Group, 2016
- Boylston, Scott. Designing Sustainable Packaging. Laurence King Publishing, 2009
- Roncarelli, Sarah.Packaging Essentials: 100 Design Principles for Creating Packages. Rockport Publishers, 2010

DS3343: Contemporary photography (2 Credits): An advanced photography course to understand develop newer storytelling practices within the area of photography. Various experimental methods are explored.
References:
- Cotton, Charlotte: The photograph as contemporary art. - London.
- Herschdorfer, N. (2011). *Afterwards*; Contemporary Photography Confronting the Past. London: Thames & Hudson.

DS3353: Advertising (2 Credits): The course objective is to gain hands-on skills required in the industry by learning basics of advertising, mode and mediums of advertising using diverse techniques of print, animation, film etc to create compelling messages. The objective would be to create full marketing campaigns where the idea and the theme will communicate a particular set of messages to create awareness.

References:
- Alex W. White. Advertising Design and Typography. Allworth; Reprint edition
- Mario Pricken. Creative Advertising: Ideas and Techniques from the World's Best Campaigns. Thames & Hudson, 2002

DS3363: Tangible Computing (2 Credits): A tangible user interface helps a person interacts with digital information through the physical environment. The purpose of TUI development is to empower collaboration, learning, and design by giving physical forms to digital information, thus taking advantage of the human ability to grasp and manipulate physical objects and materials.

References:
- Mary Lou Maher. Designing for
- Gesture and Tangible Interaction. Morgan & Claypool

DS3373: Service Design (2 credits): This course will give an overview to create / improve an existing service by keeping in mind user's and customer's needs. It will include creating a process design, organizational design, information design and technology design.

References:
- Miettinen, Satu. *Designing services with innovative methods*. University of Art and Design, 2009.
- Pine, B. Joseph, Joseph Pine, and James H. Gilmore. The experience economy: Work is theatre & every business a stage. Harvard Business Press, 1999.
- Polaine, Andy, Lavrans Løvlie, and Ben Reason. Service design: From insight to inspiration. Rosenfeld media, 2013.

DS3383: Participatory Design (2 Credits): This course expands horizons for communication designers to convert the medium from passive to active. Earlier user was a passive entity in the process of information dissemination. How to co-create compelling information experiences with the participation of the audience is the aim of the course. The outcome could be in the form of games, performance, live data visualizations etc transcending physical experience to digital experience.

References:
- Armstrong, Helen. Stojmirovic, Zvezdana. Participate: Designing with User-Generated Content. Princeton Architectural Press, 2011
- David de la Pena (Editor), Diane Jones Allen (Editor), Randolph T. Hester Jr. (Editor), Jeffrey Hou (Editor), Laura J. Lawson (Editor), Marcia J. McNally. Design as Democracy: Techniques for Collective Creativity. Island Press 2017

DS3393: Virtual Environments in Design (2 Credits): To introduce tools and methods for creating 3D virtual environments and interact through visual, haptic and aural modalities. Also Introduce basics of visual and haptic perceptions, devices, Virtual Reality (VR) technology and applications. The course also aims to provide hands-on experience of creating simple 3D scenes using open source 3D graphics library – OpenGL/Unity3D for graphics and OpenHaptics/H3DAPI for Haptic interactions.

Course Outline:
The course content is divided into two sub topics viz. Computer Graphics and Haptics
Computer Graphics: Input and Output devices, Transformations: Translation, scaling, Rotation,

Homogeneous co-ordinates. Combining Transformations. Viewing, Camera model, orthographic and perspective projections, Geometric modelling, Lighting, Texture mapping, Clipping. Stereoscopic Vision Haptics: Human haptics, machine haptics, computer haptics, Haptic rendering, algorithms, collision detection, Haptic Interactions

References:
- Edward S. Angel. Interactive Computer Graphics, A top-down approach with OpenGL. 5th Edition.Pearson Education, 2009.
- OpenGL Architecture Review Board, Dave Shreiner, Mason Woo, Jackie Neider, and Tom Davis.
- OpenGL Programming Guide: The Official Guide to Learning OpenGL. Addison-Wesley, 2005.
- Donald Hearn and M. Pauline Baker. Computer Graphics with OpenGL. Prentice Hall, 2003.

Mark Paterson, Haptics Affects and Technologies, Berg Publishers, 2007

DS3403: Stop Motion Animation (2 Credits): Stop motion animation is a cinematic process, or technique used to make static objects appear as if they were moving. This technique is commonly used in Claymation and puppet-based animation. This course offers a hands on experience of working with this medium.

References:
- Purves, B. (2014). Stop-motion Animation: Frame by Frame Film-making with Puppets and Models, Fairchild Books
- Thomas, F. & Johnston, O. (1981). Disney Animation: The Illusion of Life, Abbeville Press

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DS3413: Documentary Filmmaking (2 Credits): A documentary film a non-fiction film that aims to capture reality. The students will use videos, photographs and sound of real people and real events which when edited together, create a meaningful narrative experience.

References:
- Bernard, S. (2012). Documentary Storytelling: Making Stronger and More Dramatic Nonfiction Films, Focal Press; 3rd Edition
- Hampe, B. (1997). Making Documentary Films and Reality Videos, Holt Paperbacks; 1st edition

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DS3423: Visual Effects (2 Credits): Visual effects (VFX) is a term used to describe imagery created, manipulated, or enhanced for any film, or other moving media that cannot take place during live-action shooting. VFX is the integration between actual footage and this manipulated imagery to create realistic looking environments for the context. This course offers an introduction to the design process for developing VFX.

References:
- Failes, I. (2015). Masters of FX: Behind the Scenes with Geniuses of Visual and Spacial Effects, Focal Press

- Zwerman, S. & Okun, J. (2010). The VES Handbook of Visual Effects: Industry Standard VFX Practices and Procedures, Focal Press

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DS3433: Experimental Animation (2 Credits): This course offers the scope to define and invents new mediums of storytelling and expressions through animation. Some of the experiment outcomes of the course could be presented in mediums such as Sand Animation, Pixilation, Oil on glass, wall animation, projection mappings, etc.

References:
- Moretti, P. (Producer), Leaf, C. (1974). *The Owl Who Married a Goose: An Eskimo Legend.* (Animation Short Film), Canada. National Film Board of Canada
- Lajoie, B. Shimamura, T. (Producers), Petrov, A (Director). Hemingway, E. (Writer). (1999). *The Old Man and the Sea.* (Animation Short Film). Russia.

(Semester -7)

DS4030: Design Management and IPR (2 Credits): Essentially deals with the management of a design firm. Course looks at how the design industry works and process and logistics can be managed Keeping in mind the peculiarities of this creative industry.

References:
- Best, Kathryn. The Fundamentals of Design Management. Bloomsbury Publishing India Private Limited (2010)
- Granet, Keith. The Business of Design: Balancing Creativity and Profitability. Princeton Architectural Press (24 August 2011)

DS4040: Professional practice (2 Credits): This course covers the ethical, legal, and financial dimensions of working as a design professional.

References:
- Krishnamurthy, K. G. (2014), Professional Practice, Prentice Hall India Learing Private Ltd.
- Namavati, R. (2016), Professional Practice: With elements of Estimation, Valuation, Contract and Arbitration, Publisher: Lakhani Book Depot

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DS4050: Entrepreneurship and Business Planning (2 Credits): This course intends to provide a glimpse of the business aspect of design. The aim is to equip the students with the skill of drawing up and proposing business plans and start-ups.

References:

- Doerr, J (2017), Measure what Matters: OKRs: The Simple Idea that drives 10x growth, Publisher: Portfolio Penguin
- Ries, E (2017), The Start-up Way: How Modern Companies use Entrepreneurial Management to transform Culture and drive long term Growth, Publisher: Currency
- Fishkin, R (2018), Lost and Founder: A Painfully Honest Field guide to the Start up World, Publisher: Portfolio

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DS4060: Design Research Seminar (2 Credits): The peculiarities of research in understanding and practising design - the heuristic, creative and systematic approaches to doing research both in and through Design.

References:
- Handbook of Design Research Methods in Education, Innovations in Science, Technology, Engineering, and Mathematics Learning and Teaching. Edited by Anthony E. Kelly,(George Mason University), Richard A. Lesh (Indiana University), John Y. Baek(Center for Advancement of Informal Science Education. First published 2008 by Routledge NEW YORK AND LONDON.
- Design Research Methodology, Lucienne T.M. Blessing, Amaresh Chakrabarti, 2009

DS4086: Internship (6 Credits): Hands on practice with a design related institution to gain experience in design work space and practice. The work would be presented/displayed in front of a panel of design faculty to considered for credit work.

(semester - 8)

DS 4115: Final semester thesis project (12 credits): It's the culmination of all the theoretical and practical learning applied to a final project for which the output could be in the chosen specialised area by the student. There will be a thesis component and final product / prototype based on the chosen medium.