

Masters in Design

Industrial Design

COURSES OF STUDY

IDC, IIT Bombay

M.Des in Industrial Design

An Industrial designer is committed to the cause of improving the quality of human environment with products that are functional and aesthetic. He is a 'systems thinker' who finds creative solutions by correlating technical and ergonomic aspects with human needs. During the programme, students interact with the industry and with institutions and social organizations to understand, study, analyze and solve various kinds of existing problems. The choice and outcome of the final degree projects reflect the students aspirations to change the Indian product scene.

Industrial Design Course Content - Semester 1

Course Number	Course Name	L	T	ST	Credits
ID 631	Product Design I	1.5	0	2	6.0
ID 643	Design Issues	2	0	0	4.0
ID 647	Nature of Materials and Process	1.5	0	2	6.0
ID 649	Studies in Form I	0	0	4	6.0
VC 609	Art, Design and Society I	2	0	0	4.0
	Elective I				6.0
	Elective II				6.0
	Total Credits for Semester I				38.0

Industrial Design Elective Courses- Semester 1

Course Number	Course Name	L	T	ST	Credits
VC 603	Image Making and Representation I	0	0	4	6.0
VC 605	Photo Communication	0	0	4	6.0
ID 627	Elements of Design	0	0	4	6.0
ID 629	Media Investigation and Communication Methods	0	0	4	6.0
ID 645	Exposure to Design	0	0	4	6.0
ID 667	Design Workshop I	0	0	4	6.0
AN 609	Life Drawing	0	0	4	6.0

ID 631

Product Design I

1.5 0 2 6

- Design Definitions and Design Spectrum
- Product Attributes – Function and Emotion
- Product configurations and Component relationships (component Matrix)
- Introduction to Design Research
- Product Analysis – Diachronic, Synchronic
- Understanding and Analyzing contexts, parallel situations, future situations
- Understanding modularity and modular systems – 3D lattice and structures
- Design of Modular System – abstract design
- Process of conception and its documentation
- Seminar and exercises related to above topics

Text/ References:

- Jones, J.C : Design methods: Seeds of human futures, Wiley inter science, London, 1992.
- Gorb, Peter, Ed. Living by Design, Lund Humphries, London 1978.
- M.M Andereasen, Integrated Product Development, IFS Publications Ltd. / Springer Verlag, Berlin, 1987.
- Asimow Morris; Introduction to Design, Prentice Hall, Englewood Cliffs, N.J., 1962.
- Pulos, Arthur, The American Design Ethic, MIT, USA, 1983.
- Roozenburg and Eekels, Product Design: Fundamentals and Methods, Publisher: John Wiley & Sons Inc; New Ed edition, 1995
- Ulrich, Karl T., Eppinger, Steven D.; Product Design and Development, McGraw-Hill 1995, 2000, 2004
- Goodrich, Kristina; Design Secrets: Products: 50 Real-Life Projects Uncovered - Industrial Designers Society of America, Publisher: Rockport Publishers June 2001
- Cagan, Jonathan; Vogel, Craig M.; Creating Breakthrough Products: Innovation from Product Planning to Program Approval, Publisher: Financial Times Prentice Hall; 2002
- Rouse, William B.; Design for Success: A Human-

Centered Approach to Designing Successful Products and Systems, Publisher: Wiley-Interscience; 1991

ID 643

Design Issues

2 0 0 4

- This course is to expose the students to different thoughts and perspectives on design.
- The course will present different concerns and issues in the context of design.
- The course will also expose the students to emerging areas of design.
- Relevance of design in the context of India.
- Importance of sustainable design practices.
- Preserving traditional practices.
- Designing for the under served communities.
- Exposure to bionics, nano design, experience design, green design, etc.

Texts/Reference:

- Byers, Mel; The Design Encyclopedia, Publisher: John Wiley & Sons Publications, 1994
- Buchanan, Richard; Margolin, Victor; Discovering Design : Explorations in Design Studies, University Of Chicago Press, 1995
- Margolin, Victor; Buchanan, Richard; The Idea of Design, Publisher: The MIT Press, 1996
- Potter, Norman; What is a Designer: Things, Places, Messages, Princeton Architectural Press, 2002
- Lidwell, William; Holden, Kritina; Butler, Jill; Universal Principles of Design, Rockport Publishers, 2003
- Marzano, Stefano; Creating Value by Design: Thoughts and Facts, Publisher: Antique Collectors' Club, 1999
- Csikszentmihalyi, Mihaly; The Meaning of Things, Cambridge University Press, 1981
- Dormer, Peter; The Meanings of Modern Design: Towards the Twenty-First Century, Thames & Hudson, 1990
- Thackara, John; In the Bubble: Designing

- in a Complex World, The MIT Press, 2005
- Aicher, Otl; Jean Stock, Wolfgang; The World As Design : Writings on Design, Publisher: Wiley-VCH; Reissue edition, 1994
- Wilson, Frank; The Hand: How Its Use Shapes the Brain, Language, and Human Culture, Publisher: Vintage, 1999
- Papanek, Victor; Design for the Real World: Human Ecology and Social Change, Publisher: Academy Chicago Publishers; 2nd Rev edition, 1985
- Lindinger, Herbert (Editor); Ulm Design: The Morality of Objects, Publisher: The MIT Press; 1st MIT Press ed edition, 1991

ID 647

Nature of Materials and Processes 1.5 0 2 6

- Properties and usage of thermoplastics, thermosetting plastics. Process of selection and applications of plastics for engineering and consumer products. Design limitations and specific advantages of plastic molding processes.
- Assembly and Decorative techniques for plastic product Manufacturing processes and assembly techniques for Ferrous and non ferrous metals.
- Concepts of structure and costing.
- Significance of form in structural strength of products. Influence of materials and processes on product aesthetics.
- Industrial finishes for plastic, wood and metals.
- Properties and use of rubber, ceramics and glass. Properties of natural materials like wood, bamboo, cane, leather, cloth, jute and paper and their use at craft and industrial levels

Texts/References:

- Beadle, J.D: Plastic forming, Production\ engineering series, Macmillan, London, 1971
- Beadle, J.D: Metal forming, Production

- engineering series, Macmillan, London, 1971
- Beadle, John D : Product treatment and finishes, Macmillan, London 1971
- Beck R. D.: Plastic Product Design, Van Nostrand Reinhold Co., New York, 1980
- Cleminshaw D., Design in Plastics, Rockport, MA USA 1989
- Garratt J.: Design and Technology, Cambridge University Press, UK, 20004
- Thompson R.: Manufacturing processes for design professionals, Thames & Hudson, London 2007
- Ashby, Michael; Johnson, Kara; Materials and Design: The Art and Science of Material Selection in Product Design, Publisher: Butterworth-Heinemann; 2002

ID 649

Studies in Form I 0 0 4 6

- Introduction to 2 dimensional and 3 dimensional form. Radii manipulation in 2D and 3D form.
- Exploration of surface textures in different materials.
- 2 and 3D Form transition. Exploration of form to develop imagination and insight.
- Use of metaphors to generate new forms. Concept of family of forms.
- Introduction to 3D geometry. Basic 3D Forms: cube, tetrahedron, octahedron etc. and their imaginative use in generating complex forms and structures.
- Use of combinatorics as a method of 3Dform generation.
- Form, material and process relationship.

Texts/ References:

- Itten, Johannes; The Art of Color: The Subjective Experience and Objective Rationale of Color, Wiley Publications,1997
- Hannah, Gail Greet; Elements of Design, Princeton Architectural Press, 2002
- Byers, Mel; The Design Encyclopedia, Publisher: John Wiley & Sons Publications,

- Livio, Mario; The Golden Ratio: The Story of PHI, the World's Most Astonishing Number, Publisher: Broadway, 2003

ID 627

Elements of Design

0 0 4 6

- An introduction to basic elements: Line, texture, colour, form, symmetry, balance, scale, mass, unity and variety.
- Concept of visual language and visual design.
- Introduction to Gestalt laws, composition and figure and ground relationships.
- Introduction to concept of negative space.
- Use of symmetry. Generation of patterns and textures using simple elements.
- Introduction to typography and fonts.
- Use of grids in graphic composition.
- Colour circle, colour combinations and its dimensions: hue, value and chroma.
- Colour meanings in traditions and psychological use of colours.

Texts/Reference:

- Gail Greet Hannah, Elements of Design, Princeton Architectural Press, 2002
- Itten, Johannes; The Art of Color: The Subjective Experience and Objective Rationale of Color, Wiley Publications, 1997
- Kepes, Gyorgy; Language of Vision, Dover Publications, 1995
- Elam, Kimberly; Geometry of Design: Studies in Proportion and Composition, Princeton Architectural Press, 2001
- Lawlor, Robert; Sacred Geometry: Philosophy and Practice (Art and Imagination), Publisher: Thames & Hudson, 1989
- Hall, Edward Twitchell; The Hidden Dimension, Publisher: Anchor; Reissue edition, 1990

- Bachelard, Gaston; Jolas, Maria (Translator); The Poetics of Space, Publisher: Beacon Press; Reprint edition, 1994
- Livio, Mario; The Golden Ratio: The Story of PHI, the World's Most Astonishing Number, Publisher: Broadway, 2003
- Jute, Andre; Grids : the structure of graphic design. Crans-Pres-Celigny : Rotovision, 1996.

ID 629

Media Investigation and Communication

Methods

0 0 4 6

- Methods of pencil drawing through exercises, to coordinate eye, hand and body movements to acquire necessary control over the line drawing
- Methodology to learning illustration and presentation
- Introduction to object drawing.
- Theory of perspective, one point and two point perspective; OR Introduction to workshop technology (for Architects only).

Texts / References:

- Edwards, Betty; New Drawing on the Right Side of the Brain, Publisher: Tarcher; 2002
- Powell, Dick; Design Rendering Techniques: A Guide to Drawing and Presenting Design Ideas, Publisher: North Light Books, 1996
- Caplin, Steve; Banks, Adam; The Complete Guide to Digital Illustration, Publisher: Watson-Guptill Publications, 2003
- Demers, Owen; Digital Texturing & Paintin, Publisher: New Riders Press; Bk&CD-Rom edition, 2001
- Pogany, Willy ; The Art of Drawing, Publisher: Madison Books, 1996
- McKim, Robert; Experiences in Visual Thinking, Publisher: Brooks/Cole Publishing Company, 1980

ID 645

Exposure to Design

1.5 0 2 6

- The course will also expose the students to different aspects of design to have a broad understanding of design. The different areas covered are the following:
- Exposure to Form,
- Exposure to Typography,
- Exposure to Interactivity,
- Exposure to Animation Process

Texts/References

- Kaplan, Ralph; By Design - Why There Are No Locks on the Bathroom Doors in the Hotel Louis XIV and Other Object Lessons, Publisher: Fairchild; 2nd edition, 2005
- Spiekermann, Erik; Stop Stealing Sheep & Find Out How Type Works, E.M Ginger
Publisher: Adobe Press; 2 edition, 2002
- Carter, Rob; Ben, Day; Meggs, Philip; Typographic Design, Publisher: Wiley; 3rd edition, 2002
- Lupton, Ellen ; Thinking With Type: A Critical Guide for Designers, Writers, Editors, & Students (Design Briefs), Princeton Architectural Press, 2004
- Norman, Donald A.; The Design of Everyday Things, Publisher: Basic Books; 1st Basic edition, 2002.

ID 667

Design workshop I

0 0 4 6

- The purpose of this workshop is to let the students develop the ability to work on design projects in collaborative groups working on a topic formulated by the faculty members. Groups of 3-4 students will work on a project under the guidance of a faculty member.
- The project may involve collaboration with students from other specializations, disciplines or institutes or with professionals from the industry.

Texts/References

- Hauffe, Thomas; Design, Publisher: Barron's Educational Series, 1996
- Neill, William (Photographer); Murphy, Pat; By Nature's Design -an Exploratorium Book, Publisher: Chronicle Books, 1993
- Antonelli, Paola; Objects of Design, Publisher: Museum of Modern Art, 2003

Industrial Design Course Content - Semester 2

Course Number	Course Name	L	T	ST	Credits
ID 632	Applied Ergonomics	1.5	0	2	6.0
ID 636	Product Design II	1.5	0	2	6.0
ID 650	Studies in Form II	0	0	4	6.0
VC 614	Art, Design and Society II	2	0	0	4.0
	Elective III				6.0
	Elective IV				6.0
	Total Credits for Semester II				34.0

Industrial Design Elective Courses - Semester 2

Course Number	Course Name	L	T	ST	Credits
VC 602	Image Making and Representation II	0	0	4	6.0
VC 604	Digital Video Communication	0	0	4	6.0
VC 618	Information Graphics	0	0	4	6.0
VC 620	Advanced Typography	0	0	4	6.0
VC 624	Designing Interactive Experiences	0	0	4	6.0
VC 626	Story and Narrative	1.5	0	2	6.0
ID 634	Sketching for Designers	0	0	4	6.0
ID 638	Product Interface Design	0	0	4	6.0
IN 604	Usability Evaluation	1.5	0	2	6.0
IN 612	Interactive Medias	0	0	4	6.0
IN 614	Soft Prototyping Techniques	0	0	4	6.0
AN 608	Anatomy and Drawing	0	0	4	6.0
ID 668	Design Workshop II	0	0	4	6.0
	Institute Elective				6.0

ID 632**Applied Ergonomics****1.5 0 2 6**

- Introduction to the concept of system design in product design, Analysis of MME system design, How to assess the interface design, Design methodology, Body dimensions and its application in design, Dimensional optimization for the population and use of percentile, The musculo-skeletal system and joint motion study, Human body follows the principle of lever, Basic model on calculation of biomechanical stresses on our body. Effect of stresses imposed on body. Design from the view point of biomechanics, Work posture analysis, Static and Dynamic work, The visual, auditory and thermal environment and their impact on design. Design for the physically challenged.
- Controls and display Psycho physiological aspects of design.
- Research techniques in Ergonomic data generation, interpretation and application of statistical methods. Case analysis.
- Mini Project work involving Ergonomic design research for product system.

Texts/References

- M. S. Sanders and Ernest J. McCormick: Human Factors in engineering and Design, Sixth Edi., McGraw-Hill International Editions, 1987.
- P.O. Astrand and K. Rodahl : Textbook of work physiology, McGraw Hill, New York, 1970.
- West, J.B. Et. Al : Best and Taylor's physiological basis of medical practice, 11th Edn., Williams and wilkins, "Baltimore, 1985
- K. F. Wells and K. Luttgens: kinesiology: Scientific basis of human motion, W.B.Sunders Co., 6th Edi., 1976.
- K.H.E.Kroemer and A.D.Kroemer: Office Ergonomics, Taylor and Francis, 2001.
- P.R.Boyce: Human Factors in lighting, Taylor and Francis, 2003.

- Ken Parsons: Human thermal environment, 2nd Edi., Taylor and Francis, 2003.
- E. Grandjean: Fitting the task to the man, Taylor and Francis, 1963.
- E. Grandjean: Ergonomics of the home, Taylor and Francis, 1973.
- K.L. Andersen & others: Fundamental of Exercise Testing, World Health Organization, Geneva, 1971
- W.E. Woodson, Human Factor Design Handbook, McGraw Hill, New York, 1981
- Gross, Clifford M.; The Right Fit: The Power of Ergonomics As a Competitive strategy, Publisher: Productivity Press Inc, 1996

ID 636**Product Design II****1.5 0 2 6**

- The emphasis of the course is on group design projects. Selection of the projects is based on the possibility of user interaction leading to innovation. Projects end with a comprehensive presentation through working/ mock up models, design drawing and a report.
- The project is supported by detailed discussion on various stages in the design process emphasizing the complimentary nature of systematic and creative thinking.
- This is achieved by short supporting assignment in following topics: Creativity techniques like brain storming & synectics to develop creative attitude and open mind, design opportunity, problem perception , Idea Sketching ,clustering of ideas for concept development, exploratory mockup models for concept development, evaluation of concepts, final concept selection, concept development, refinement and detailing.

Texts/References

- Loewy Raymond: Never Leave Well Enough Alone, Simond and Schuster, N.Y, 1951

- Gordon, W.J.J : Synectics, Harper & Row, .Y., 1968
- Hill, P.H : The Science of engineering design, Holt, Rinehart and Winston, N.Y, 1970
- De Bono Edward, Lateral Thinking, Penguin (UK), 1972
- G.Pahl and W. Beitz: Engineering Design, A Systematic Approach, springer, London, 2001
- Kelly Tom: The Art of Innovation, doubleday, NY , 2001
- Prahalad C.K : The Fortune at The Bottom of The Pyramid, Wharton School Publishing, 2005
- Baxter, Mike; Product Design - Practical
- Methods for the Systematic Development of New Products, Publisher: Chapman & Hall, 1995

ID 650

Studies in Form II

0 0 4 6

- Form exploration in the context of products.
- Expressions in Form like soft, hard, warm, cold, precise, gross ,delicate , strong, fragile, rugged etc.
- Study of product expressions by analyzing in terms of elements like form, proportion, colour, texture etc.
- Introduction to abstraction in form. Study of 3D abstraction in art and sculpture. Exploration of industrial material and processes as elements of design through 3D abstraction of entities in Nature.

Texts / References:

- Kimberly Elam, Geometry of Design: Studies in Proportion and Composition, Princeton Architectural Press, 2001
- Thompson, Darcy Wentworth; Bonner, John Tyler (Editor); On Growth and Form by D"Arcy Thompson
- Doczi, Gyorgy; Power of Limits, Publisher: Shambhala; Reissue edition, 1981
- Lawlor, Robert; Sacred Geometry: Philosophy and Practice (Art and Imagination), Publisher: Thames & Hudson, 1989
- Kepes, Gyorgy; Language of Vision, Dover Publications, 1995

- Abhikalpa : The journal of Industrial Design Centre, IIT Bombay, January 1984

ID 634

Sketching for Designers

0 0 4 6

- Study of geometry of elements in products and its application in object drawing. Product presentation in various media like pencil, ink and colour.
- Presenting thoughts and ideas in design through sketches, perspective and exploded views.
- Presentation of product design concepts through simplified graphics presentation.
- Typefaces, Typography and printing.
- Exposure to digital photography.

References

- Powell, Dick; Design Rendering Techniques: A Guide to Drawing and Presenting Design Ideas, Publisher: North Light Books, 1996
- Buxton, Bill; Sketching User Experiences: Getting the Design Right and the Right Design (Interactive Technologies), Morgan Kaufmann, 2007
- Caplin, Steve; Banks, Adam; The Complete Guide to Digital Illustration, Publisher: Watson-Guption Publications, 2003

ID 638

Product Interface Design

0 0 4 6

- Investigations and study of visual, functional and ergonomic requirements of control and display interfaces. Legibility of display elements, character of different typefaces and their readability.
- Study of the process of building interactions.
- The course involves an interdisciplinary approach including User Centered Design Process, Activity Activity

Analysis, Structuring of Content, Participatory Design, Experiential Ideation, Scenario Building, Linear and Animatic Storyboarding, Soft Physical Prototyping Techniques.

- The students will collaboratively design an interactive product interface

Texts/References

- Crosby, Fletcher and Forbes; A, Sign Systems Manual, Studio Vista, London, 1970.
- W.H Mayhall; Machines and Perception in Industrial Design, Studio Vista, NY, 1968.
- Norman, Donald, A Design of Everyday Things, MIT press, 1990
- Nielsen, Jakob, Usability Engineering, San Diego, CA: Academic Press, 1993.
- Deborah J. Mayhew, The Usability Engineering Lifecycle: :Practitioner 'Handbook for User Interface Design, Academic Press / Morgan Kaufmann, 1999.
- Jenny Preece, Yvonne Rogers, Helen Sharp 'Interaction Design: Beyond Human- . Computer Interaction' New York, John Wiley & Sons, Inc., 2002.
- Shneiderman, Ben; Designing the User Interface: Strategies for Effective Human-Computer Interaction, Addison-Wesley Publishing Co. 1997
- Laurel, Brenda (Editor); The Art of Human-Computer Interface Design. Reading, MA: Addison-Wesley Publishing Co., 1990. ISBN: 0-201-51797-3.
- Kunkel, Paul; English, Rick (Photographer); Appledesign: The Work of the Apple Industrial Design Group, Publisher: Graphis Press, 1997

ID 668

Design workshop II

0 0 4 6

- The purpose of this workshop is to let the students develop the ability to work on design projects in collaborative groups working on a topic formulated by

the faculty member. Groups of 3-4 students will work on a project under the guidance of a faculty member.

- The project may involve collaboration with students from other specializations, disciplines or institutes or with professionals from the industry.

Texts/References

- Hauffe, Thomas; Design, Publisher: Barron's Educational Series, 1996
- Neill, William (Photographer); Murphy, Pat; By Nature's Design -an Exploratorium Book, Publisher: Chronicle Books, 1993
- Antonelli, Paola; Objects of Design, Publisher: Museum of Modern Art, 2003

Industrial Design Course Content - Semester 3

Course Number	Course Name	L	T	ST	Credits
VC 615	Indian Thoughts and Traditions	2	0	0	4.0
ID 641	Product Planning, Strategy and Marketing	1.5	0	2	6.0
	Elective V				6.0
	Elective VI				6.0
IDP 601	Summer Project 1 (Mid May - Mid june)				6.0
IDP 602	Design Project 2 (Mid June - End november)				18.0
	Total Credits for Semester III				46.0

Industrial Design Elective Courses - Semester 3

Course Number	Course Name	L	T	ST	Credits
VC 627	Advanced Digital Video Communications	0	0	4	6.0
VC 619	Advanced Photography	0	0	4	6.0
VC 635	Studies in Human Computer Interaction	0	0	4	6.0
VC 637	Experimental Animation	0	0	4	6.0
VC 667	Visual Culture	1.5	0	2	6.0
ID 639	Design Management and Professional Practice	1.5	0	2	6.0
ID 653	Product Detailing	0	0	4	6.0
ID 657	Advanced Ergonomics	0	0	4	6.0
ID 659	Product Semantics	0	0	4	6.0
ID 665	Craft, Creativity and Post-Modernism	0	0	4	6.0
ID 669	Design Workshop III	0	0	4	6.0
ID 675	Designing Game for Children	0	0	4	6.0
IN 653	Instructional Design	1.5	0	2	6.0
AN 611	Representation Methods for Animation	0	0	4	6.0
	Institute Elective				6.0

ID 641

Product Planning and Marketing **1.5 0 2 6**

- Corporate strategy for product planning, Management thinking on new products, seeing product as part of the image of the company, Moving into future, Defining companies business, Technology transfer problems, SWOT analysis, Analysis of strength, weakness, opportunities and threat.
- Brief introduction to assessing of companies financial performance. Study of product life cycle, Monitoring of sale and competition, when to introduce new products. Assessing market potentials for new products, market research, Consumer research and its demographic aspects, setting up a questionnaire for these aspects.
- Establishing market segment and their dimensions. Assessing competitors share and locating direct and indirect sources to understand this. Assessing competitors marketing approach and strategies.
- Developing a strategy to introduce new products, Using market gaps as competitive edge, cost considerations and profitability of new products.
- Developing a product plan and product mix, price policy, positioning the company, product positioning, planning for future position. Evolving a design brief by interlinking with market/product plan.
- Seeing product design as a part of a scheme to develop brand image, house style, marketing strategy and corporate image. Discriminating product range from each other and from competitor's range.
- Developing product specifications for different products within the range. Market communication, launching the product, monitoring the market performance.

References

- Kotler Philips: Marketing management, 5th ed. Prentice Hall, New Delhi, 1984 .
- Agarwal, I : Product planning: Seminars on

Product Planning held in IDC, IIT Bombay 1982

- Levitt Theodore: Marketing Imagination, Free Press, New York, 1986

IDP 601

Summer Project I

6 Credits

(Mid May to mid July)

This is a summer project that can be done with an industry, professional design firm, an institution or an organisation like an NGO. The objective of this project is to be part of the process where design is being implemented, contribute towards the process and learn from the situation. The project is meant to expose the student to design practices in his chosen area of interest. This project is expected to influence the degree project in many cases.

IDP 602

Design Project II

18 Credits

(Mid July – November end)

- An independent project with one of the following focus:
- Design project of student interest and / or faculty interest and / or industry project
- Re-design project that relooks at an existing problem or situation
- Research project, delving into methodological or pedagogic issues
- Exploration project, exploring application possibilities in a new technology or medium or variations

ID 639**Design Management and Professional Practice****1.5 0 2 6**

- Designer attributes. Setting up a design office. Finding clients.
- Business correspondence. Brief and briefing. Letter of contract.
- Professionalism and Ethics. Costing design and fee estimation.
- Management of Design Process, Human factor in managing design / team work.
- Design as a Management Tool. Design Evaluation.
- Patent and Design Registration laws / procedure.
- Seminar on a topic related to above topics

Text/References

- Farr, Mihael; Design Management, Hoddar and Stoughton, London, 1966.
- Goslet Dorothy, The Professional Practice of Design, Batszford, London 1971.
- Pulos, Arthur J, Contract Selling Industrial Design Services, Office of Design, Department of Industry, Trade and Commerce, Ottawa, 1975.
- Abbott Howard, Safer by Design, Design Council, London, 1987.
- Brustein David & Frank Stasiowski, Project Management for the Design, Professional, Whitney Library of Design, New York, 1982.
- Staurt W Rose, Achieving Excellence in Your Design Practice, Whitney Library of Design, New York, 1987.
- Oakley, Mark (Ed.), Design Management - a Handbook of Issues and Methods, Basil Blackwell Ltd. 1990.
- Case studies by Design Management Institute, USA

ID 653**Product Detailing****0 0 4 6**

- Detailing in plastic products, while using processes like injection molding, vacuum molding, compression molding, F.R.P. moulding.
- Design detailing for fabricated products in sheet metal, steel tubes and angles, aluminum sheets and extruded sections.
- Detailing while using fabric materials, foam and other cushions, leather and cloth in combination with materials like wood and metal.

Text/References

- Ashby M., Johnson K., Materials and Design: The Art and Science of Material Selection in Product Design: Butterworth-Heinemann; 1st edition, 2002
- Feirer, J.L : Cabinet making and mill work, revised ec., Bennet, Perria, 1977
- Ronald D. Berk : Plastic product design, Van Nostrand
- Beadle, J.D : Plastic forming, production engineering series, Macmillan, London, 1971
- Degarmo E. P. ..(et al.), Materials and processes in Manufacturing 9th ed., John Wiley & sons, 2002
- Haller.L. ..(et al.), Design Secrets: Products 2: 50 Real-Life Projects Uncovered
- Industrial Designers Society of America: Rockport

ID 657**Advanced Ergonomics****0 0 4 6**

- Electrophysiology and its application in product design. Design and human behavior, Use of eye movement recording in visual behavior analysis.
- Ergonomics of human energy expenditure and its application.
- Psycho-physical analysis of product, paired comparison test

- Research oriented work: - Product analysis short paper communication.

Text/References

- L. Spillmann, and J.S. Werner: Visual perception: The neurophysiological foundations; Academic Press, 1990
- M. S. Sanders and Ernest J. McCormick: Human Factors in engineering and Design, Sixth Edi., McGraw-Hill International Editions, 1987.
- P.O. Astrand and K. Rodahl : Textbook of work physiology, McGraw Hill, New York, 1970.
- West, J.B. Et. Al : Best and Taylor"s physiological basis of medical practice, 11th edn., Williams and wilkins, "Baltimore, 1985
- K. F. Wells and K. Luttgens: kinesiology: Scientific basis of human motion, W.B.Sunders Co., 6th Edi., 1976.
- E. Grandjean: Fitting the task to the man, Taylor and Francis, 1963.
- E. Grandjean: Ergonomics of the home, Taylor and Francis, 1973.
- K.L. Andersen & others: Fundamental of Exercise Testing, World Health Organization, Geneva, 1971.
- W.E. Woodson, Human Factor Design Handbook, McGraw Hill, New York, 1981.
- Williams, P.L , M. yson, Ed. Gray"s Anatomy, 37th ed., ELBS/Churchill Livingstone, 1992.
- E. Steinfeld, and G.S.Danford : Enabling environments : Measuring the impact of environment on disability and rehabilitation, Kluwer Academic / plenum publishers, 1999.

Journals

- Applied Ergonomics
- Ergonomics
- Industrial Design

ID 659

Product Semantics

0 0 4 6

- The course discusses various theories in product semantics and later focuses on categorization theory as a framework for product semantics. Different theories on object categorization are reviewed to develop a logical design approach to deal with product form and its meaning. The approach is also seen in context of taxonomy of objects and developed further as an analytical as well as generative tool.
- The influencing factors for product form are modeled to include the concept of product identity. The approach is used to discuss new issues faced in the global markets and ends by suggesting how bi-cultural identities can be consciously developed through product form.
- The course is supported by short studio assignment and a design project.

Text/ References:

- Lakoff, G: Women, fire, and dangerous things, University of Chicago Press, 1990
- Krippendorff, K : Semantic turn : new foundation for design, Taylor and Francis, 2005
- Vihma, S (ed): Semantic vision in design : symposium on design, University of Industrial Arts (UIAH), 1990
- Gibson, E.J : Principles of perceptual learning and development, Appleton, New York, 1966
- Posner, Mol & Keele, S.W : On the gene-sis of abstract idea. Journal of Experimental Psychology, 1968, 77, 353--363
- Rips, L.J, Schoben, E.J & Smith, E.F : Semantic distance and the verification of semantic relations, journal of verbal learning and verbal behavior, 1975, 14, 665--681
- Rosch, Mervis, Gray, Johnson & Boyes-Braem- Basis objects in natural categories,
- Cognitive psychology, 8, 383-435
- Posner, M,I : Abstraction and the process of recognition, in Bower and Spence eds, the psychology of learning

and motivation, academic press, New York, 1969, 3, 44-96

ID 665

Craft, Creativity and Post-modernism 0 0 4 6

- Creative process in Craft. Craft as a means to explore material, process and Form. Study of Form in Bamboo and Other Craft. Cultural roots in Craft.
- Craft as an expression of Indian Tradition.
- Significance of craft as a creative base for current Design practices. Post modern interpretation of craft.
- Creative exploration in Craft. Design to suit urban and export markets.

Text/ References

- John Thackara (Ed), Design After Modernism (Beyond the Object), 1989
- Victor Margolin (Ed), Design Discourse (History, Theory, Criticism), The University of Chicago Press, 1989
- Powell, Jim; Postmodernism for beginners, Orient Longman, India, 1998
- Jencks, Charles; Post-Modernism: A New Classicism in Art and Architecture, Academy Editions, London, 1987
- McKim, Robert; Experiences in Visual Thinking, Publisher: Brooks/Cole Publishing Company, 1980

ID 669

Design workshop III 0 0 4 6

- The purpose of this workshop is to let the students develop the ability to work on design projects in groups working on a topic formulated by the faculty member. Groups of 3-4 students will work on a project under the guidance of a faculty member.
- The project may involve collaboration with students from other specializations, disciplines or institutes or with professionals from the industry.

Texts/References

- Hauffe, Thomas; Design, Publisher: Barron's Educational Series, 1996
- Neill, William (Photographer); Murphy, Pat; By Nature's Design -an Exploratorium Book, Publisher: Chronicle Books, 1993
- Antonelli, Paola; Objects of Design, Publisher: Museum of Modern Art, 2003

ID 675

Designing Game for Children 0 0 4 6

- Definition of games. Differences between toys, puzzles and games. Classification of games. Learning through games. Educational games with focus on fun vs/ and education. Use of luck vs development of strategic thinking and problem solving in game design. Concepts of play value and game play.
- Game design process. Iterative cycles in game design process. Players' involvement in design process. Feedback as a source of creativity in game design. Differences between game design and other design areas.
- Age specificity of games. Learnability as a criteria for game design.
- Games as a social process. Studying and developing player interactions.
- Designing conventional game hardware and board games. Paper prototyping and testing. Play testing of games for feedback. Market for board games in India.
- The elective expects developing and play-testing an original game.

Text/ References

- Berlin, Eric : Amazing family game board book : includes authentic game pieces, Pub: Innovative kids, 2005

Industrial Design Course Content - Semester 4

Course Number	Course Name	L	T	ST	Credits
ID 660	Design Research-Seminar	0	0	4	6.0
IDP 603	Design Project III – Stage 1 (from December 1st – end February)				12.0
IDP 604	Design Project III – Stage 2 (from March – April /June)				24.0
	Total Credits for Semester IV				42.0
	Total Credits for M Des. programme in Product Design				160.0

ID 660**Design Research-Seminar****0 0 4 6**

- The course involves student researching in an area related to design and is expected to produce an insightful report or a paper on the topic. Students need to choose a topic suggested by a faculty member and work under faculty guidance. The work may involve primary and secondary research, creative exploration out alternatives, experimental set-ups and methodical documentation. Students are encouraged to explore new fields, materials and media, with a focus on analysis. The student is required to present a seminar on the topic at the end of the semester.

IDP 603**Design Project III Stage 1****12 Credits**

- Duration: 3 months from December – end of February.
- This project could be an extension of the previous project (if the scope of the project justifies the extension) or it could be an independent project with one of the following focus:
 - Design project of student interest and / or faculty interest and / or industry project
 - Re-design project that relooks at an existing problem or situation
 - Research project, delving into methodological or pedagogic issues
 - Exploration project, exploring application possibilities in a new technology or medium or variations
- The evaluation of the Stage 1 of Project III is done internally with a panel appointed by the DPGC in consultation with the guide. The panel will consist of the guide and two other faculty members.

IDP 604**Design Project III Stage 2****24 Credits**

- Duration: 2-4 months from March – end June.
- This project will be an extension of the project III and should include development of the final design concept. The defence presentations will be held during the month of April and time given till the end of June to complete the jury feedback, final drawings and finer detailing of the project.
- The evaluation of the Stage 2 of Project III is done by a panel of examiners appointed by DPGC. The panel will consist of external jury member along with an internal examiner, the guide and the chairman (A Professor or an Associate Professor from another Department of IIT Bombay)