

## ***Digital, Material, Engaged & Undisciplined: Introducing a Bachelor of Design at the Australian National University***

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### **Abstract**

Computers, software and the network are staples of our everyday lives, and with them come new challenges to design practice and education. Approaches geared to the production of stable physical artefacts must be adapted to a setting in which the product is not only virtual but always evolving and never complete. How do we prepare our design graduates for this challenging new context? While there is overwhelming consensus that digital literacy and expertise with code is vital (Maeda 2016), we argue that a deeper engagement with material production is equally as important. This paper uses the development of the ANU's new Bachelor of Design as a case-study to explore this proposition. It defines some of the most significant factors pressuring established design practice and details how our team at the ANU have attempted to adapt our curricula to meet those challenges. We detail the conceptual and theoretical foundations supporting our approach, and show how the digital and material are being brought together in novel ways to cultivate design graduates capable of contributing in a turbulent cultural and technical context.

**Keywords:** Design, digital, materiality, computation, interconnection.

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As with all aspects of society, design today is being disrupted by digital technology. The digital is transforming the tools, practices, and production processes of designers; design scholars increasingly recognise the breakdown of traditional disciplinary boundaries in the field. There is clearly a compelling need for design education to address the digital and the changing and increasingly 'undisciplined' character of design practice. This paper outlines a new Bachelor of Design course, to be offered in the School of Art at the Australian National University from 2017. This new program is an attempt to respond to the changing character of design practice and the transformative role of the digital, and seize these as opportunities for a vibrant curriculum capable of equipping graduates with the curiosity and capability to meet the challenges and shape the future of our complex contemporary society.

### **Digital, Networked & Undisciplined Design**

As a platform common to all forms of contemporary design practice, the digital is not only changing *how* those traditional vocations are practiced but *who* is practicing them. As Bremner and Rogers write, 'the boundaries of what were once recognized as discrete design disciplines, such as product, graphic, textile, and fashion design, have been ruptured and continue to dissolve' (Bremner & Rogers, 2013). The once exclusive technologies of traditional design disciplines are now available to anyone with a standard computer. Increasingly those software programs possess a shared vocabulary; 'vectors', 'bitmaps', '3D models', and 'code' are staples of software-based design. This digital ubiquity supports an unprecedented mobility between disciplinary areas: as Bremner and Rogers recognise 'an indeterminacy of professional boundaries now exists, and fluid patterns of employment within and between traditional design disciplines is commonplace' (2013). Networked communication technologies further aid interchange and interconnection. According to Hight and Perry, the new forms of creative practice emerging from this networked-enabled interconnectedness go beyond hybridity and signal a more significant blurring of disciplinary boundaries. Drawing on Pierre Lévy's notion of collective intelligence they see design knowledge as a "larger patchwork" in which one field can be enfolded with another' and formerly discrete disciplines enter into 'hypercommunicative technosocial networks' (2006).

To some extent, evidence of design's reformulation can be found in the emerging industries that service the new digital economy; user experience, service design, system design, and games design to name but a few. Charting the course of design in the new digital economy, John Maeda's annual 'Design In Tech' report paints an overwhelmingly positive picture. According to Maeda, design has been central to the success of the new digital economy and is positioned to play a significant role in all forms of enterprise. In evidence Maeda cites data relating to acquisitions of design-initiated companies; the stock value of those same companies; the prominence of design in their daily operation; and the increasing number of designers acting as directors of companies. According to Maeda, designing for the new digital economy ('Design Intech') is related yet radically different from what he calls 'Classical Design' (architecture, interior design, fashion design, landscape architecture, communication design, industrial design). Perhaps most significantly, DesignInTech typically involves producing living systems that are never finished and address scale unimagined by classical design approaches.

The digital described here is more than a toolset, it is a force that has transfigured the disciplinary and conceptual boundaries of design (Hight & Perry 2006). The proliferation of the digital has resulted in 'connections that are no longer "amid" disciplines and cannot be measured "across" them, nor even can be seen as encompassing a "whole" united system' (Bremner & Rodgers 2013). As Bremner and Rodgers see it, 'the digital has generated an "other" dimension so that we might now need to consider "alter-disciplinarity" or "undisciplinarity" as the most effective approach for the future of design' (2013).

### **Designing a Hybrid Curriculum**

The picture here is of design as an evolving field that no longer sits comfortably within traditional disciplinary boundaries. Instead we find hybrid forms of emergent practice being conducted by practitioners who are 'a mixture of artists, engineers, designers, thinkers' (Dykes et al 2009, West 2007, Bremner & Rodgers 2013). For Marshall and Bleecker, 'These new ways of working make necessary new practices, new unexpected processes and projects' that represent an epistemological shift offering 'new ways of fixing the problems the old disciplinary and extra-disciplinary practices created in the first place' (2010).

In creating an educational response to this context, we set about defining a program that would foster the kinds of hybridity that are signatures of today's new design practices. These

are practices which ‘straddle ground and relationships between art, architecture, design and technology, where different idioms of distinct and disciplinary practices can be brought together’ (Marshall & Bleecker 2010). To support and encourage these kinds of transdisciplinary connections, the program is built around a modular structure rather than prescribed vocational study plans.

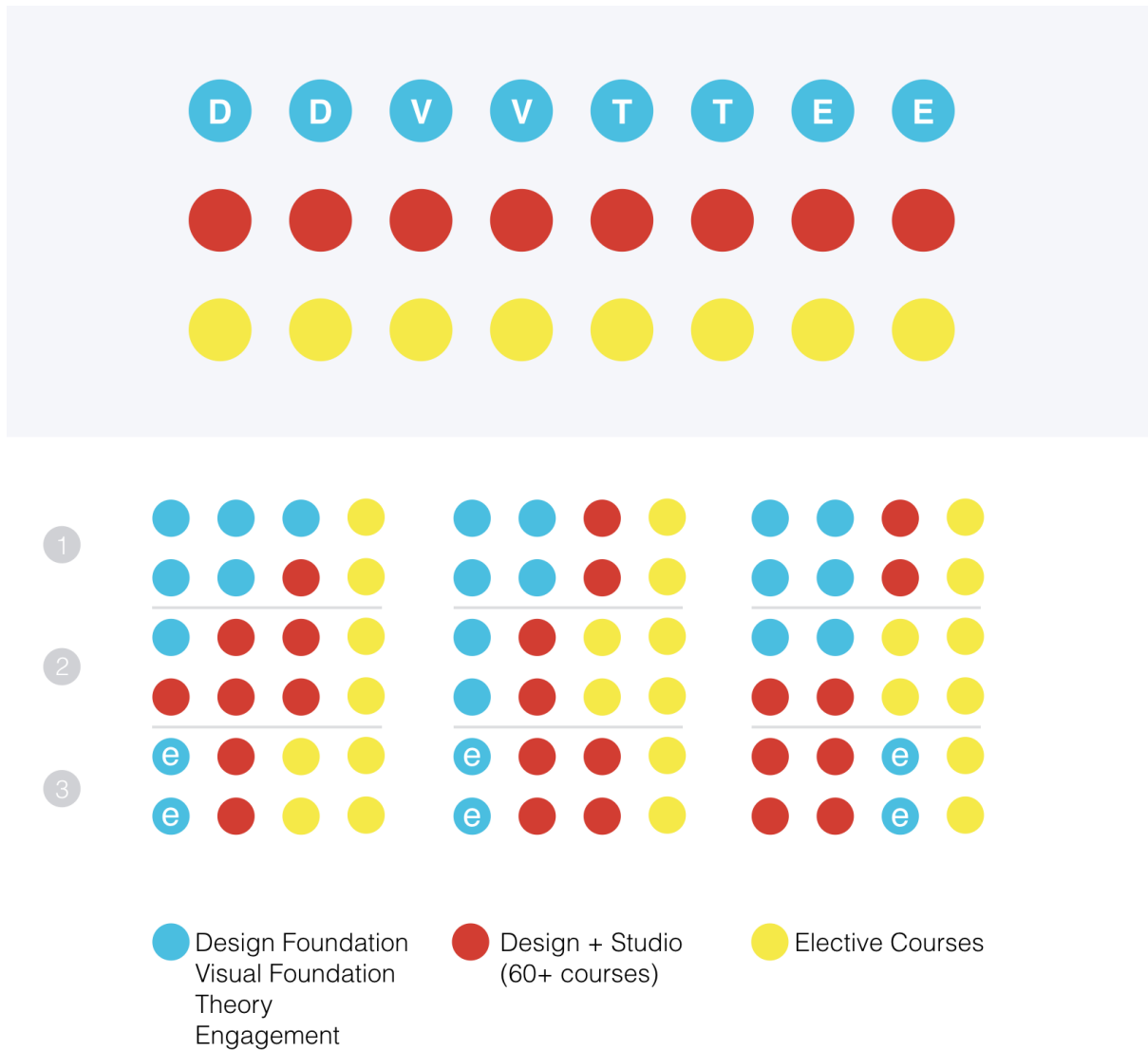


Figure 1. Curriculum structure.

Figure 1 shows the basic composition of the three-year undergraduate degree. The blue dots indicate foundational content: 2 x design, 2 x visual arts foundation, 2 x theory, and 2 capstone engagement courses. The red dots represent the modular core of the program and the yellow represent elective courses. The red core (Design + Studio) provides choices spanning over 60 courses from School of Art workshops, art and design history and theory, as well as new design content with a strong focus on the digital (such as data visualisation,

creative code, dynamic design, digital fabrication) and the methodological (such as speculative design, critical design, design thinking, user-centred methods). The grids in the lower half of the diagram demonstrate a few of the different ways a student may organise their studies over the three-year period.

The program's modular structure aims to support the kinds of hybridity we find in new and emerging forms of design practice and which we seek to foster in our students. The range of hybridity will ultimately be determined by individuals. In simplistic terms, the program aims to support everyone from the digital specialist, to the hand-craft artisan, to the new renaissance designer marrying digital and artisanal practices. But it also encourages studies that access the wider university in areas such as anthropology, art history & theory, curatorship, commerce, digital humanities, IT, languages, law, marketing, music, and science. Clearly our position within the School of Art at the Australian National University is anything but arbitrary; it is only within such a rich and diverse educational context that our modular program can flourish.

While breadth (versatility and hybridity) is a key concern we also acknowledge the need for students to attain depth within a particular focus area. This combining of breadth and depth is commonly referred to as 'T-shaped skills' or the 'T-shaped person' (Brown 2010). The vertical stroke of the T refers to depth of expertise and the horizontal stroke of the T refers to a person's breadth of knowledge. A recent report by the Foundation for Young Australians found that employer demand for 'enterprise skills' was just as high as the technical skills relevant to specific jobs (Anderson 2016). Enterprise skills are very much akin to breadth in the T-shape and include things such as digital literacy, presentation skills, but also critical thinking. For IDEO CEO, Tim Brown, capacity for collaboration is the most integral component of T-shape breadth.

Breadth and depth are addressed in the range of courses offered; with the modular structure supporting both. Collaboration, however, is not a discrete subject but a theme we have aimed to embed within many different courses, and sees students engaging with peers, public, and industry. This kind of collaborative interaction provides valuable professional experience but perhaps even more importantly exposes students to the human face of design. Design is today being better understood as a human-centred practice rather than being defined by a particular technology or medium. As an example of that shift, on job listing site seek.com.au we find roles previously cast as 'web design' or 'interface design' or even 'graphic design' being redefined as 'user experience design' - a field incorporating activities from graphic, interface, and web but more overtly oriented to the user. Design as a

human-centred activity opens opportunity to draw on knowledge, concepts and techniques from a broad array of subject areas including art, anthropology, psychology, computer science, data analytics, and business studies.

## **Digital + Material**

Collaboration and engagement in all of its varied forms also act to ground the program, situating it firmly in the physical world in which we live. As a program located within an established art school, ANU Design has a strong connection to material practice and also to making. We see both making and materiality as integral to the education of future designers. While digital technology is often framed in a narrative of dematerialisation, weightlessness and the rise of the virtual, this view is at best simplistic and at worst, ethically unsustainable. The material impact of the digital is felt everywhere, from server farms to selfies, e-waste to Uber. Increasingly we see that the digital is embedded in a material continuum of forms and practices, even as the computer's talents for abstraction and automation are changing the world around us. Echoing this sentiment, Peter Zumthor commented on the 2016 Venice Biennale: 'Everyone says that manual labour is dying and the computer is taking over, but no, the computer is just a slave and we are doing the work with our hands still' (Dezeen, 2016). Apple's Jonathan Ive says 'Many of us ... believe in the poetic possibilities of the machine, while in equal measure, we have tremendous respect and admiration for what is made by hand' (Dezeen, 2016).

This continuity of digital and material is reflected in our curriculum design; in structural terms the course combines design-focused curriculum with complementary study in the School's studios and workshops. We emphasise the makerly and material aspects of digital design, with a focus on reflective exploration and experimentation. Fabrication is a significant technique not because it 'materialises' the digital, but because it draws digital workflows into complex dialogs with materials and physical process; it shapes both the digital workflow and the materials in play (Whitelaw, 2011). Thus fabrication is a useful practical demonstration of the digital / material continuity at the core of the course.

As well as articulating the digital and the (physical) material, we also treat digital techniques and resources as *materials* for design. In a recent turn within interaction design, digital technology is framed as a material with complex social, cultural, personal and aesthetic attributes which are best explored through making, rather than specified through functional requirements (Jung and Stolterman, 2012). Armitage (2009) shows how data itself can be

usefully approached through ‘material exploration’ within a design process. By treating data, code and computation as materials for making alongside — and in combination with — more traditional studio practices, we further emphasise the continuity of digital and material. In this way we aim to induct students into a design practice that is makerly, exploratory and versatile, spanning a gamut of materials, technologies and applications appropriate to a contemporary ‘undisciplined’ context.

### **Discussion: Practicing what we preach**

We acknowledge other local and international efforts to address emerging forms of design; programs such as ‘Creative Intelligence and Innovation’ (UTS), ‘Design Futures’ (Griffith) and ‘User Experience Design’ (SCAD) all attempt to address gaps and offer new approaches in design education. Like the field of design itself, design education should encompass a wide range of approaches, experiences and outcomes. And in this regard, we hope that our new program will offer a vital perspective that complements other established design curricula.

Creating curricula for a new program is always challenging, and even more so when it attempts to address a field in which evolution and adaptation are constants rather than temporary states. Our aim is to create a program which will prepare students for a turbulent contemporary design context but which will also be fit to respond to that same evolving context. Responsiveness presents challenges in an institutional setting; though certainly Australian universities are increasingly aware of the need to move rapidly to address emerging opportunities. Art and design education in Australia has long negotiated the competing demands of educational depth, student load, choice, flexibility and constrained resources — and our project is no different. However, in our favour is the fact that in meeting those constraints and challenges we did not have the burden of having to dismantle or transform an existing program. Instead we have been able to progress with a relatively light touch and fashion a program which is lean, agile and adaptable.

The obvious risk with a modular program structure is the prospect of students dabbling without sufficient focus and depth. In a bid to counter this possibility, we have embedded program rules such as: limiting the number of level one courses that can be undertaken; requiring completion of a minimum number of design-based and studio-based courses within the core; and implementing strategic scaffolding between particular courses to encourage acquisition of greater depth. In short then, we recognise the risk of ‘broad and shallow’ and

have attempted to minimise that risk, but in any case, we consider the need to educate designers who are inventive, open and agile as a more significant concern. This is particularly the case as design practice is increasingly reconfigured as issue or project-based rather than discipline-based (Bremner & Rogers, 2013). Issue-based design requires that designers have the will and capacity to adapt their practice to meet the demands of a particular project or problem, rather than prescribing a disciplinary-based response. This approach is reflected in the third year of our curriculum, where diverse groups of students come together to engage in substantial real-world projects.

As has been made evident throughout this paper, convenient disciplinary definitions are dissolving in the field of design. The vocation-specific models of training that have long dominated design education in Australia are increasingly untenable. Rather than resisting this shift we have attempted to embrace it and use it to our advantage. We do not offer our new program as a definitive solution; we expect it to develop continuously, much like the perpetually-designed 'living systems' that John Maeda recognises. At the same time, we recognise that no graduate of any three-year undergraduate degree emerges as a fully-fledged designer. We see the undergraduate program as a grounding in a complex and rapidly changing field, and aim to set students on a path to ongoing learning and development.



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