Information-processing explanations are at the heart of experimental psychology, cognitive science and artificial intelligence. These sciences have been enormously successful in predicting behaviour; they also seem to offer explanations as to why people and artificial systems behave as they do. Yet one of the central explanatory resources of this ‘cognitive revolution’ – the nature of the information being processed – is poorly understood. On the one hand information as characterised by the quantities of mathematical informational theory is found in all physical systems and seems to have little to do with the mind. On the other it is connected to the representations that figure in everyday explanations of behaviour, for example beliefs, which can be true or false. The sciences of the mind depend heavily on the existence of representations which play both of these roles; our everyday explanations of behaviour may do too.

Philosophical issues about the nature of representational content have become pressing in recent years with the rise of cognitive neuroscience, which appears to go further and locates representations in concrete processes in the brain. This course will explain the foundational principles underlying these psychological sciences and examine the central philosophical questions they raise about what representations are and how information-processing explanations work.

The module aims to provide an understanding of:
- How representations are relied in the behavioural and brain sciences
- The representational theory of mind
- The difference between realist and instrumentalist representational explanations
- The language of thought and connectionist alternatives
- Conceptual role semantics: definitional and prototype versions
- Informational and teleosemantic accounts of representational content

There will be a one hour lecture and a one hour seminar each week.

### Assessment methods and deadlines

- **Formative assessment:**
  1 x 2,000–3,000-word essay, due by 16.00 on Friday 5 December 2014, by email to module tutor

- **Summative assessment:**
  1 x 4,000-word essay, due by 12:00 (noon) on Tuesday 20 January 2015 through KEATS
### Outline of lecture topics (plus suggested readings)

**Week One**
The Representational Theory of Mind  

**Week Two**
The Language of Thought  

**Week Three**
Neural Computations Over Nonconceptual Representations  
Shagrir, O. (2012). ‘Computation, San Diego Style.’ *Philosophy of Science*, 77(5), 862-874; and  

**Week Four**
Predictive Coding  

**Week Five**
Concepts: Definitions  

**Reading Week**
No lecture: extra reading for week six; see also background reading and additional readings below.

**Week Six**
Concepts: Prototypes  

**Week Seven**
Correlational Information  
http://www.philosophy.uconn.edu/department/millikan/appb.pdf

**Week Eight**
Teleosemantics  

**Week Nine**
Content from Learning  

**Week Ten**
Informational and Functional Content  
### Suggested essay questions

1. Familiar representations like sentences and maps depend for their significance on intelligent readers or interpreters of their contents. Can information-processing psychology avoid this problem?

2. Could a person have a language or languages of thought whose constituent structure is substantially different from the grammatical structures of their natural language?

3. (a) ‘The productivity and systematicity of thought show that the language of thought hypothesis is the only game in town, notwithstanding the claims of cognitive neuroscience to have discovered computational processes in the brain that occur over representations without semantically-significant constituent structure.’ Do you agree? OR

(b) Does a commitment to semantically-significant constituent structure come at a theoretical cost, and if so, what is it buying?

4. Explain and assess the predictive coding hypothesis.

5. Psychologists theorise about how thinkers are disposed to apply their concepts (definitions, prototypes, theories, etc.), whereas philosophers are interested in the reference of concepts and its metaphysical basis. Are these two issues related?

6. Can a theory that founds representational content on correlational information ever differentiate between proximal and distal causes? Can it differentiate between properties regularly co-instantiated by the same objects? Answer either or both questions.

7. The 'information' of information-processing psychology must be something more than the correlational properties characterised by mathematical information theory. Is teleology the missing ingredient?

8. Can teleosemantic theories reliant on evolutionary functions plausibly be extended to systems that engage in learning?
## Suggested additional readings

### Background reading

The following will provide a very useful overview if read before or during the early weeks of the course:


### Additional reading

#### Weeks 1-2


#### Week 3


esp. § 1-3 & 10


Week 4


Weeks 5-6


Weeks 7-10


Further readings will be posted on the course website during the semester.