



Use of JACS for coding research

Reason for review

Research Councils UK (RCUK) has identified that there is scope to bring JACS codes into closer alignment with 'Research Topics' used by individual Councils to report on their research portfolios and to match the profiles of potential reviewers to those of proposals. It is recognised that there is significant potential advantage for the HE Sector if RCUK can classify its research projects, and reviewers using a system similar to JACS. This would facilitate 'Health of Disciplines' reporting by allowing RCUK research records to be compared with the JACS codes selected by staff for their highest qualification and students for their PhD subjects.

Objectives

- To map existing Research Council "Research Topics" against JACS and identify where new JACS 3.0 codes are required.
- To examine whether the wording of an existing JACS code title or description requires to be updated to make it appropriate to both research classification and classification of teaching.
- To identify further areas of harmonisation in subject classification across the sector.

Experts consulted

- Arts and Humanities Research Council
- Biology and Biotechnology Research Council
- Economic and Social Research Council
- Engineering and Physical Sciences Research Council
- Medical Research Council
- Natural Environment Research Council (including Research Centre Librarians)
- Science and Technology Facilities Council

Comparison in certain areas took place with the [Australia/ New Zealand Standard Research Classification](#).

Changes to be implemented

A total of 38 new codes (14 C and 21 F, 2 L and 1 M) have been requested by RCUK. One of these (Development Studies) is at the Principal Subject level. We consider this justified because this was a Unit of Assessment in the RAE, and is likely to continue as a UoA in the Research Excellence Framework.

All the requested codes relate to Research Topics (or 'disciplines') already in use by Research Councils. They are therefore 'tried and tested', and are suggested only where existing JACS 2.0 codes are not appropriate. They are grouped into Biological Sciences, Physical Sciences and Other.

A further 98 codes have been suggested by EPSRC, BBSRC and STFC to bring their existing classifications into line with JACS 3.0. The suggestions have not been finalised however, and are not included here. Councils had been waiting till HEFCE provided information on the likely Units of Assessment to be used in the Research Excellence Framework, but this is now not likely to be available till October 2009.

Changes proposed by NERC in Biological Sciences (Group C)

Full Code	Category	RC Mapping	Description
C120	Behavioural biology	NE2	The study of biological factors of behaviour. The study of the behavioural strategies used by organisms in their natural environment to maximise fitness. Includes foraging, social and reproductive (including parental care, sexual selection and mate choice) behaviour, behavioural responses to predators, communication, migration and homing.
C183	Community ecology	NE6	The study of the structure, composition and dynamics of ecological assemblages. Includes the relationship between species assemblages and their environments, trophic structure, succession, stability, biodiversity, coexistence and competitive exclusion, spatial structure and relative abundance of component species.
C184	Conservation ecology	NE7	The study of the science underpinning the restoration and conservation of species and communities and their natural habitat.
C185	Ecosystem ecology & land use	NE11	The study of large-scale ecology including catchment and regional studies, landscape ecology and interactions between ecology and land use patterns.
C186	Population ecology	NE35	The study of the understanding of population dynamics, including trophic interactions, demography of populations, extinction processes, spatial processes and metapopulation dynamics.
C187	Ecotoxicology	NE12	The study of the branch of toxicology concerned with toxic effects, caused by natural or synthetic pollutants, to the constituents of ecosystems (animal (including human), vegetable and microbial) in an integral context. It includes diagnostics, tolerance and adaptation in relation to natural and anthropogenic toxic substances.
C260	Plant physiology	BB74	The study of the area of botany concerned with the function or physiology of plants. Includes processes such as photosynthesis, respiration, plant nutrition, plant hormone functions, tropisms,

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			nastic movements, photoperiodism, photomorphogenesis, circadian rhythms, environmental stress physiology, seed germination, dormancy and stomata function and transpiration.
C270	Developmental & reproductive plant biology	BB46	The study of plant growth relating to reproduction and development.
C280	Systematic botany	NE44	The study of morphological, numerical and molecular methods of identifying and classifying living and fossil plants. Includes the reconstruction of phylogenies.
C330*	Developmental & and reproductive zoology	BB	The study of the reproduction and development of animals, including embryos, fertilisation, foetal growth and maturation, ovarian function, fertility and the differentiation of cells, tissues and organs.
C380	Systematic zoology	NE44	The study of morphological, numerical and molecular methods of identifying and classifying living and fossil animals, including reconstruction of phylogenies.
C441	Transcriptomics	BB68	The study of transcriptomics; the branch of chemistry which deals with the study of messenger RNA molecules produced in one or a population of cell types.
C451	Functional genomics	BB63	The study of functional genomics; the branch of molecular biology that uses data produced by genomic projects (such as genome sequencing projects) to describe gene (and protein) functions and interactions. Functional genomics focuses on the dynamic aspects such as gene transcription, translation, and protein-protein interactions.
C452	Genome organisation	BB51	The study of adult stem cells, chromosome duplication, chromosome structure, comparative mapping, gene mapping, genome rearrangements, ploidy, Single Nucleotide Polymorphism (SNP), genome evolution and telomeres..
C470	Population genetics & evolution	NE34	The study of speciation and population genetics, gene flow/population structure, hybrid zones, island populations, genetic drift and conservation genetics. This includes adaptation and the evolution of life histories.
C510*	Applied microbiology	NE17, BB55	The study of topics in microbiology of commercial, environmental or social importance. Includes interactions between the environment and microbial systems, bioremediation and microbial diversity.

*Existing codes with reworded titles or descriptions

Changes proposed by NERC in Physical Sciences (Group F)

Full Code	Category	RC Mapping	Description
F331*	Atmospheric physics	NE1, NE42, NE47, NE48, NE50	The study of the Earth's stratosphere, troposphere and upper atmosphere including atmospheric kinetics and water in the atmosphere.

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F420*	Archaeological science	NE39	The study of the scientific analysis of the material remains of past cultures. Includes an approach to reconstruct and understand the past. Also includes the application of physical, chemical and biological techniques to aid scientific, archaeological and geo-archaeological investigations.
F522*	Planetary science	NE32	The study of the physical science of the solar system including the measurement of the Earth and its gravitational field.
F530	Solar & solar terrestrial physics	ST	The study of the sun and the interaction of the sun with the Earth.
F540	Astronomy observation	ST	The study of astronomy utilising observational techniques to undertake research.
F550	Astronomy theory	ST	The study of the theoretical aspects of astronomy.
F630*	Geotechnology	NE8, EP59	The study of the principles and applications of geotechnical engineering. Includes aspects of civil engineering and the construction and extraction industries.
F644	Hydrogeology	NE21	The study of the physical, chemical and biological processes which occur at the interface between rock and water at or below the Earth's surface at all scales. Includes water-related geological processes beneath oceans, aquifers, groundwater resources and the response of aquifers to environmental change.
F645	Mantle & core processes	NE26	The study of the processes which determine the behaviour and composition of the earth's mantle and core.
F646	Land - atmosphere interactions	NE23	The study of the quantification and modelling of the fluxes and transformations of material and energy between the land (including the biosphere) and the atmosphere. Includes the variability of these interactions in time and space.
F680	Geohazards	NE19	The study of the prediction, monitoring, environmental effects, risks and mitigation of long-term, extreme and catastrophic natural geological events including landslips, earthquakes and volcanic eruptions. Includes the assessment of the frequency and magnitude of triggers and events.
F681	Seismology & tectonics	NE46	The study of the processes affecting the large scale movement and deformation of the Earth's crust. Includes orogenesis, faulting, earthquakes and seismicity, neotectonics and tectonic control of sedimentation.
F682	Vulcanology	NE49	The study of the origin of ancient and modern volcanoes and vulcanicity. Includes the location, history and structure of volcanoes, their emissions and deposits. Also includes the reconstruction of these characteristics and of earth history from the studies of volcanic materials and their impacts in the geological record.
F731	Ocean circulation	NE28	The study of water circulation in seas and oceans on a variety of temporal and spatial scales based on modelling and/or observations. Includes extreme water circulation events.

Full Code	Category	RC Mapping	Description
F732	Oceanographic survey & monitoring	NE43	The study of oceanographic survey, mapping and monitoring (as the primary purpose of the activity, rather than as a tool).
F733	Land- ocean interactions	NE24	The study of the quantification and modelling of the fluxes and transformations of material and energy between the terrestrial and marine environments. Includes the variability of these interactions in time and space.
F734	Atmosphere - ocean interactions	NE27	The study of the quantification and modelling of the fluxes and transformations of material and energy between the marine and atmospheric environments. Includes feedback mechanisms, coupled ocean/atmosphere models and the variability of these interactions in time and space.
F754	Biogeochemical cycles	NE3	The study of the fluxes and cycling of matter within and between the biosphere and the physical environment.
F755	Environmental informatics	NE16	The study of the science of information applied to environmental sciences relating to the creation, collection, storage, processing, modelling, interpretation, display and dissemination of data and information.
F756	Environmental physiology	NE18	The study of the physiological responses of plants and animals to the environment. Includes homeostasis, stress, physiological responses and survival strategies.
F762	Large-scale atmospheric dynamics & transport	NE25	The study of global circulation of the troposphere and stratosphere, including time variability, wave motions (from small-scale gravity waves to large-scale planetary waves and equatorial waves) and their effect on the radiation balance. Also includes large-scale transport and mixing processes in the free troposphere and stratosphere.
F763	Boundary-layer meteorology	NE4	The study of the models of local and regional airflow and dispersion. Includes the understanding of airflow over complex surfaces, urban meteorology and links to air pollutant formation and dispersion.
F764	Climate & climate change	NE5	The study of the modelling and analysis of current and past climate variability and causes of change on all timescales. Includes the understanding and modelling of future climate change, the detection and attribution of past change and the prediction of the impacts of climate change on the environment.
F765	Radiative processes & effects	NE37	The study of the observations and modelling of radiation from the ultra-violet to the infrared and microwave. Includes field, laboratory and modelling studies of radiation and its effects on the environment.
F780	Glaciology & cryospheric systems	NE20	The study of the origins, processes of formation, characteristics and impacts of glacial, ice cap, shelf ice and sea ice features. Includes physical, chemical and biological processes in the cryosphere. Also includes glacial tectonics, ice deformation, periglacial processes, determination of glacial events from the

Full Code	Category	RC Mapping	Description
			geological record, the interactions between the cryosphere and the atmosphere and terrestrial and aquatic environments.

*Existing codes with reworded titles or descriptions

Changes proposed by ESRC in Other Areas (Groups L and M)

Full Code	Category	RC Mapping	Description
L728	Human demography	ES5	The statistical study of any kind of human population that changes over time or space. Includes the study of the size, structure and distribution of human populations, and spatial and/or temporal changes in them in response to birth, migration, aging and death.
L800	Development studies	ES1	The study of global and local processes of cultural, demographic, economic, environmental, political, technological and social change in low and middle income parts of the world, with particular reference to structures and institutions, the changing relationships between developed and developing countries and the critical interrogation of theories of these processes and relationships, and of development policy.
M270	Sociology of law	ES28	The study of legal phenomena from a social and inter-disciplinary perspective bridging the divide between law, sociology, social policy, and economics.