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3. Short course on «Expert Systems in Civil Engineering» Bergamo, Italy, October 16 – 17, 1989

ISMES is organizing – with the sponsorship of IABSE – a two-day course, to be held in Bergamo just before the IABSE Colloquium on «Expert Systems in Civil Engineering», scheduled in October 1989.

Some companies outside the field of civil engineering now depend upon expert systems to maintain profitability and competitiveness. Expert systems are being developed in industry, research institutions and universities.

In spite of such potential and recent development activity in civil engineering, successes are not widely recognized. Improvement in knowledge acquisition and representation have provided new and powerful development tools. Also, civil engineers are developing new approaches to problem solving using knowledge bases in order to satisfy more efficiently the needs of their profession.

The course is aimed to provide a good opportunity for engineers to learn introductory elements and state-of-art of expert systems with special reference to their application to civil engineering problems.

One of the objectives is also to give a suitable scientific and technical background to those participants who – although not familiar with expert systems – wish to attend the IABSE Colloquium.

All the lectures will be given in English, by high level specialists, who will also take part in the Colloquium.

Application for the above course is completely separate from the registration procedure for the Colloquium; ISMES will mail final information and the detailed course programme to persons who will apply before May 1, 1989 to:

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Colloquium's themes (October 18 – 20, 1989)

Session 1: *Expert-system technology*

Civil engineering problems generally cannot be treated by simple expert-system shells (e.g. rule based systems). Solutions require the use of sources and methods such as data bases, numerical computations (e.g. finite-element analysis), treatment of uncertainty and incompleteness, reasoning based on qualitative physics, man-machine interfaces, etc. This session will address the software technology required to manage successfully the complexity of civil engineering problems.

Session 2: *Expert systems for operations, maintenance and damage assessment of structures*

Existing and deteriorating structures are complex systems; their behaviour and damage states are difficult to evaluate. In spite of recent advances in structural analysis and computer technology, it is often difficult and economically unacceptable to model mathematically the behaviour of structural systems. Therefore specialist knowledge is required for tasks such as assessing the state of deterioration, determining causes, evaluating associated risks and suggesting a remedial strategy.

Expert systems have found applications in areas such as corrosion, fatigue, bridge rating, vibration, seismic vulnerability and damage assessment.

Session 3: *Expert systems for design and construction*

This session will cover the application of expert systems to site layout, preliminary design, code checking, computer-aided design, construction engineering and management, cost estimating, etc. Innovative solution strategies such as «plan-generate-test» and «problem reduction» have been developed.

Session 4: *Expert systems in other area of civil engineering*

Developments in other areas are concerned with geotechnical site characterization, interpretation of in-situ and laboratory soil tests, assessment of hazardous-waste sites, water-quality protection, estimating design floods, etc.

All correspondence and requests for further information on the Colloquium should also be directed to the address above.