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CLASSIFICATION STANDARD

**MATHEMATICS**

**SCIENTIFIC AND PROFESSIONAL CATEGORY**

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## INTRODUCTION

This standard describes the classification plan used to determine the relative difficulty of jobs allocated to the Mathematics Group. It consists of an introduction, definitions of the Scientific and Professional Category and the Mathematics Group, and level descriptions.

The level description method is used to classify jobs allocated to the Mathematics Group. Each of the seven levels in the classification plan is described in terms of the primary features used to assign jobs to the level. Jobs are regarded as being of equal difficulty and are assigned to the same level when the duties and responsibilities best correspond, on the whole, with the description of that level.

### Use of the Standard

Four steps are to be followed in applying this classification standard.

1. The position description is studied to ensure understanding of the position as a whole. The relation of the position being evaluated to positions above and below it in the organization is also studied.
2. The allocation of the position to the category and group is confirmed by reference to the definitions and the descriptions of inclusions and exclusions.
3. The position is tentatively assigned to a level by comparing the duties and responsibilities of the position with the level descriptions. The position is tentatively assigned to that level that best corresponds on the whole with the duties and responsibilities of the position.
4. The description of the position being evaluated is compared with the descriptions of the levels above and below the level tentatively selected, as a check on the validity of the level selected.



CATEGORY DEFINITION

Occupational categories were repealed by the Public Service Reform Act (PSRA), effective April 1, 1993. Therefore, the occupational category definitions have been deleted from the classification standards.

GROUP DEFINITION

For occupational group allocation, it is recommended that you use the [Occupational Group Definition Maps](#), which provide the 1999 group definition and their corresponding inclusion and exclusion statements. The maps explicitly link the relevant parts of the overall 1999 occupational group definition to each classification standard.

GLOSSARY OF TERMS

"Field of Specialization" refers to a part of the professional field that has been emphasized during formal education and/or in which the position requires a given level of competence, e.g. the general field of Mathematics and Statistics includes fields of specialization such as sample design, survey methodology, analysis of data, time series analysis, computational statistics, and quality control.

"Interdisciplinary or multi-disciplinary Team" refers to a group of people, each of whom represents a different field of expertise. Any one member usually represents only one discipline but may have expertise in more than one.

"Mathematical and Analytical Methods and Techniques" refers to the methods and techniques applied in designing experiments and/or surveys, simulating systems or processes, evaluating and analyzing factual and numerical data and modifying or developing mathematical and statistical techniques and their computer realization.

"Other Organizations" refers to units outside one's own responsibility centre, not necessarily outside one's department or agency.

"Policy" refers to a declaration of aims and intent established by legislation or ministerial authority to guide future courses of action.

"Program" refers to a general plan designed to achieve the objectives determined by a department or agency to meet the aims and intent of policy.

"Project" refers to a unit of work for which objectives have been defined and which is circumscribed by budgetary controls, time limits and the availability of resources.

"Related Fields" refers to general or specialized fields that are pertinent to or associated with the work, e.g. in Mathematics and Statistics related fields include Economics, Sociology, Demography, Quantitative Genetics, Systems Research, Informatics, Computational statistics.

"Subject-matter Areas" refers to the facts, theories, ideas, techniques and related matters that are encompassed within Mathematics and Statistics and are used in the conduct of research and development, studies, investigations, projects or programs.

"Subject-matter Fields of Application" refers to those fields of activity with which the work is concerned and for which an understanding of related programs, policies, procedures and regulations is required, e.g. health, education, transportation, construction.

"Subject-matter Specialists" refers to people with specialization in "subject-matter fields of application" as defined above.

"Supervisory responsibility" refers to the responsibility for controlling, training or assessing performance of other employees and for planning, directing and ensuring satisfactory completion of their work.

N.B. Terms in this Glossary that are not used in the standard are provided for the sake of consistency in preparation of job descriptions.

POSITION EVALUATION PLAN

MATHEMATICS GROUP

LEVEL DESCRIPTIONSMA Level 1Nature of Work

This is a recruitment and developmental level for positions involved in the collection, measurement and evaluation of information required for studies, surveys and research; or in the application of procedures for the computation of quantitative data. Assignments are progressive in nature.

Characteristics

Detailed instruction, advice and guidance are received on specific work assignments. Sources of information are indicated.

The work is periodically reviewed for progress and adherence to instruction. Guidance and direction are provided by supervisors.

Completed assignments are reviewed for consistency, completeness, thoroughness of application of selected method, techniques or procedure and validity of conclusions.

## MA Level 2

### Nature of Work

This level includes positions involved in the application and use of mathematical techniques for the collection, measurement, evaluation and analysis of data in a variety of subject matter fields of application. Tasks of progressive magnitude and complexity are allocated leading to assignment to specific aspects of projects. Positions at this level work independently on an individual task or as a member of a project team.

Responsibilities involve the planning and scheduling of own work, arranging for the collation and orderly presentation of data, and reporting on the findings and results.

### Characteristics

Initially assignments are screened and objectives are limited.

Guidance is provided on methods, priorities and unusual problems.

The work is reviewed for accuracy and thoroughness, and to ensure reliability of results and validity of interpretation.

Contacts are limited to within the department or to other Mathematical Statisticians connected with the tasks for the purpose of screening or clarifying information and explaining the mathematical calculations and techniques employed.

MA Level 3Nature of Work

This level includes positions involved in the investigation or conduct of studies in various subject matter fields, and in the development of mathematical methods to measure, control, interpret and solve a variety of problems within these fields or in the fields of mathematical and statistical analysis. Positions at this level work independently or participate in project teams or have incidental supervisory responsibilities within a matrix framework.

Responsibilities involve the selection, application and adaptation of mathematical, statistical and analytical methods to a variety of problems, the determination of mathematical requirements, the identification of problems, the provision of advice and the suggestion of changes in methods, the independent planning, carrying out and completion of the assignment.

Characteristics

Assignments are limited to smaller projects or components of larger projects characterized by the need for in-depth investigation and evaluation.

Assignments are usually allocated with a general statement of the approach to be taken and of the results desired.

The work is reviewed for soundness of approach, methods utilized and final results, conclusion or recommendations.

Guidance is available on approaches to unusual problems.

Contacts extend to working relationships with officials and professionals in own departments, or in some instances to those in other government departments, agencies or outside organizations.

MA Level 4Nature of Work

This level includes positions involved in the applications of specialized and complicated mathematical and statistical techniques or methods for the collection and analysis of data, for the solution of problems or improvement of existing statistical application. Positions at this level work independently or participate in project teams or have limited supervisory responsibilities for the work of other professionals and support staff.

Responsibilities involve the modification of models and techniques, the suggestion of changes to methods, the assessment of the suitability of new mathematical, statistical or analytical methods and computer applications, and the investigation and development of new avenues of statistical processes and mathematical techniques for application.

Characteristics

The work at this level is concerned with a variety of interrelationships of data and problems, and is characterized by the need for extensive investigation and evaluation of data.

The work is further complicated by the lack of significant and useful information in the subject-matter fields of application.

The work is reviewed for adequacy and quality, however validity of technical recommendations, accuracy of evaluations and interpretations are not normally subject to review.

Contacts and liaison are maintained with senior representatives or management level officials in own department, or in some instances to those in other government departments, agencies, or outside organizations to discuss or advise upon the scope of studies, to formulate approaches, etc.



MA Level 5Nature of Work

This level includes supervisory positions responsible for the direction, supervision and coordination of the work of a number of qualified Mathematical Statisticians. Also included at this level are consultative positions who advise, counsel and guide management, professional or scientific personnel on projects requiring the application of mathematical and statistical techniques and methods; and research positions undertaking applied research. Positions at this level also participate in projects or lead smaller projects or components of larger projects.

Supervisor: Responsibilities involve directing the investigation or conduct of studies in various subject matter fields and in the development of mathematical methods, to measure, control, interpret and solve a variety of problems within these fields or in the mathematical and statistical fields.

Consultant: Responsibilities involve the planning and conduct of quantitative studies or the provision of specialist advice, involving examining and clarifying project objectives, defining resource requirements, developing approaches and work plans, advising on the appropriate mathematical and statistical techniques, presenting study conclusions and recommendations, and developing and applying implementation plans and schedules; and advising clients or project staff on the application of mathematical and statistical techniques and methods to problems.

Researcher: Responsibilities involve the conduct of applied research in mathematical and statistical techniques and methods for application in departmental projects.

Characteristics

Direction and guidance received is general.

Progress in the work is reviewed for conformance with policy, standards and guidelines. Advice given is accepted as complete and scientifically sound.

Contacts and liaison are maintained with senior representatives or management level officials in the government, agencies, or outside organizations to discuss or advise upon the scope of studies, to formulate approaches, etc.

MA Level 6Nature of Work

This level includes first level of professional management positions responsible for the direction, coordination and management of the professional work of mathematical statisticians engaged in statistical studies through two or more statisticians (i.e. at the MA Level 4 or 5). Also included at this level are senior consultative positions responsible for the identification and analysis of management, scientific or statistical problems and subsequent recommendation for their solution requiring the application of operational research, mathematics and statistics; and senior research advisory positions responsible for the conduct of extensive or in-depth research providing direction and advice to managers and to other researchers.

Manager:

Responsibilities involve assessing the need for initiating and promoting the development of new concepts and approaches in statistical methods and mathematical analysis and related areas; defining the limits of studies and projects; and providing advice on statistical, mathematical, experimental or survey methodology or operational research to senior managers and professionals of own or other organizations.

Senior Consultant:

Responsibilities involve the marketing of consulting services; the organization and conduct of major quantitative studies involving defining and establishing project objectives, developing new approaches and methodologies, negotiating project agreements, leading project teams, preparing conclusions and recommendations and advising clients in the implementation of recommendations; and advising clients (i.e. managers of own or other organizations) or professional staff on mathematical techniques and other phases of an activity where mathematics is the prime approach to arriving at a solution.

Senior Research Advisor:

Responsibilities involve providing advice to managers and professional staff on problems in mathematical statistics and the application of research results or research and development required in projects. The emphasis is either on the conduct of extensive or in-depth research for long term or broad application or on the guidance of the research of others.

Characteristics

The work is done within broad general principles, departmental policy and existing legislative and administrative requirements.

Recommendations and conclusions are accepted as authoritative and have a significant impact on the development and conduct of individual programs.

Contacts are with senior officials in government departments, agencies and international organizations, providing technical, advisory and consultant services.

Acts as departmental representative on committees or panels.

MA Level 7Nature of Work

This level includes the highest level of professional management positions responsible for the direction, coordination and management of the professional work of mathematical statisticians engaged in statistical studies through two or more subordinate managers at the MA Level 6. Also included at this level are positions of senior consultant and advisor to senior departmental management personnel; the provision of this authoritative counsel contributes significantly to departmental programs and mathematical or statistical research and requires recognition of professional standing and outstanding competence within an individual field.

Manager:

Responsibilities involve the proposal, planning, development and technical direction of major projects and studies, mathematical or statistical approaches in programs in various subject matter fields, and the provision of related authoritative counsel to senior management of own or other departments.

Senior Consultant and Advisor:

Responsibilities involve the provision of advice, counsel and guidance to senior departmental management on the interpretation and application of research findings or of mathematical techniques and methodology in departmental programs, and on the research or development required to improve the statistical efficiency, reduce the cost of programs and provide input into the formulation of long-term policy and program objectives.

Characteristics

Decisions and advice are accepted as authoritative and form the mathematical and statistical basis of major programs.

Advice provided will also have a significant impact upon a broad range of programs.

Contacts are with senior officials in government departments, agencies and international organizations, providing technical, advisory and consultant services.

Acts as departmental representative on committees or panels.