Code: 06E8
Family: IT-Leadership
Service: Administrative
Group: Clerical, Accounting, and General Office
Series: Information Technology

CLASS TITLE: DATA SCIENCE LEAD

CHARACTERISTICS OF THE CLASS

Under direction, this is a Lead level classification. The class is primarily supervisory in nature overseeing and leading all large and critical initiatives focused on the overall management and maintenance of advanced analytic methods to extract value from data and influence teams and decisions through the presentation of data-based, and performs related duties as required

This class is assigned to the Leadership Technology Job Family which consists of positions responsible for overseeing the identification, prioritization, and delivery of work activities, coach and developing employees, providing thought leadership to business partners, and shaping and executing the technology vision and strategy to maximize business values.

ESSENTIAL DUTIES

- Leads a team of Data Scientists that is accountable for providing data that is congruent and reliable, propose innovative ways to look at problems using data mining approaches, validate findings using experimental and iterative approaches and present back their findings by exposing their assumptions and validation in a way that can be easily understood by enterprise stakeholders
- Models complex business problems and discovers insights through the use of statistical, algorithmic, mining, and visualization tools
- Collaborates with cross-functional stakeholders to understand the enterprise usage of data, interacts with project and product teams to provide insights and influence decisions, performs targeted analysis for leaders and works often with Engineers and Technical Administrators to architect specialized databases and computing environments
- Guides and inspires the organization about the business potential and strategy of artificial intelligence (AI)/data science
- Identifies AI business opportunities
- Collaborates across the business to understand IT and business constraints and with ML operations (MLOps), data engineers, and IT to evaluate and implement ML deployment options
- Prioritizes, scopes and manages data science projects and the corresponding key performance indicators (KPIs) for success
- Defines and communicates governance principles
- Discovers new data sources, documents them and promotes reuse
- Designs and creates data pipelines for more efficient and repeatable data science projects, as required
- Applies statistical analysis and visualization techniques to various data, such as hierarchical clustering, T-distributed Stochastic Neighbor Embedding (t-SNE), principal components analysis (PCA)
- Generates hypotheses about the underlying mechanics of the business process
- Tests hypotheses using various quantitative methods
- Displays drive and curiosity to understand the business process to its core
- Networks with domain experts to better understand the business mechanics that generated the data

- Applies various ML and advanced analytics techniques to perform diverse classification or prediction tasks
- Integrates domain knowledge into the ML solution, for example, from an understanding of financial risk, customer journey, quality prediction, sales, marketing
- Tests of ML models, such as cross-validation, A/B testing, bias and fairness, stress-testing
- Implements champion/challenger test (A/B tests) on production systems
- Monitors execution and health of production ML models
- Establishes best practices for ML development and production infrastructure (e.g., cloud, Spark, GPUs, containers)
- Trains other business and IT staff on basic data science principles and techniques
- Trains and coaches peers on specialist data science topics
- Networks with internal and external partners
- Promotes collaboration with other data science teams within the organization (if there is a decentralized data science practice)
- Encourages reuse of artifacts

***NOTE**: The list of essential duties is not intended to be inclusive; there may be other duties that are essential to particular positions within the class.*

MINIMUM QUALIFICATIONS

Education, Training, and Experience

- Graduation from an accredited college or university with a Bachelor's degree in Computer Science, Data Science, Operations Research, Statistics, Applied Mathematics, Economics, Engineering, or Physics, or a directly related field, with five (5) years of project work experience in launching, planning, and executing data science projects, or an equivalent combination of education, training and experience

Licensure, Certification, or Other Qualifications

- Specialization in ML, AI, cognitive science, or data science preferred
- Specialization in text analytics, image recognition, graph analysis or other specialized ML techniques such as deep learning, etc., is preferred
- Experience in executing end-to-end significant data science projects preferred with the ability to manage large data science projects and diverse teams

WORKING CONDITIONS

- General office environment

EQUIPMENT

- Standard office equipment (e.g., phone, printer, copier, computers, mobile devices)
- Standard productivity suites (e.g., Microsoft Office Suite, OpenOffice, Google Workspace)

PHYSICAL REQUIREMENTS

- No specific requirements

KNOWLEDGE, SKILLS, ABILITIES, AND OTHER WORK REQUIREMENTS

Knowledge

Comprehensive knowledge of:

- *coding in several languages
- *database programming languages for relational databases and upcoming nonrelational databases
- *solving [vision, text analytics, credit scoring, failure prediction, propensity to buy]

Moderate knowledge of:

- *various techniques to boost project outcomes: e.g., transfer learning, synthetic data, federated machine learning
- *high-performance computing (HPC)
- *distributed data/computing tools
- *agile methodologies and well-versed in applying DevOps/MLOps methods to the construction of ML and data science pipelines.
- *operationalizing ML workflows using specialized MLOps frameworks, or general task orchestration frameworks
- *multiple deployment environments including [cloud, on-premises and hybrid], multiple operating systems and through containerization techniques
- *commercial/open-source data discovery/analysis platforms
- *statistical and data mining techniques: [generalized linear model (GLM)/regression, random forest, boosting, trees, text mining, hierarchical clustering, deep learning, convolutional neural network (CNN), recurrent neural network (RNN), T-distributed Stochastic Neighbor Embedding (t-SNE), graph analysis, etc.]

Knowledge of applicable City and department policies, procedures, rules, and regulations

Other knowledge as required for successful performance in the lower-level series.

Skills

- *ACTIVE LEARNING - Understand the implications of new information for both current and future problem-solving and decision-making
- *ACTIVE LISTENING - Give full attention to what other people are saying, take time to understand the points being made, ask questions as appropriate, and not interrupt at inappropriate times
- *CRITICAL THINKING - Use logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems
- *LEARNING STRATEGIES - Select and use training/instructional methods and procedures appropriate for the situation when learning or teaching new things
- MONITORING - Monitor and assess performance of one's self, other individuals, or organizations to make improvements or take corrective action
- *COMPLEX PROBLEM SOLVING - Identify complex problems and review related information to develop and evaluate options and implement solutions
- MANAGEMENT OF PERSONNEL RESOURCES - Motivate, develop, and direct people as they work and identify the best people for the job
- *TIME MANAGEMENT - Manage one's own time or the time of others

- *COORDINATION WITH OTHERS - Adjust actions in relation to others' actions
- INSTRUCTING - Teach others how to do something
- *JUDGEMENT AND DECISION MAKING - Consider the relative costs and benefits of potential actions to choose the most appropriate one
- *SYSTEMS ANALYSIS - Determine how a system should work and how changes in conditions, operations, and the environment will affect outcomes
- *SYSTEMS EVALUATION - Identify measures or indicators of system performance and the actions needed to improve or correct performance relative to the goals of the system
- *OPERATIONS ANALYSIS - Analyze needs and product requirements to create a design
- TECHNOLOGY DESIGN - Generate or adapt equipment and technology to serve user needs

Other skills as required for successful performance in the lower-level series.

Abilities

- *COMPREHEND ORAL INFORMATION - Listen to and understand information and ideas presented through spoken words and sentences
- *SPEAK - Communicate information and ideas in speaking so others will understand
- *COMPREHEND WRITTEN INFORMATION - Read and understand information and ideas presented in writing
- *WRITE - Communicate information and ideas in writing so others will understand
- *CONCENTRATE - Concentrate on a task over a period of time without being distracted
- *RECOGNIZE PROBLEMS - Tell when something is wrong or is likely to go wrong
- *REASON TO SOLVE PROBLEMS - Apply general rules to specific problems to produce answers that make sense
- COME UP WITH IDEAS - Come up with a number of ideas about a topic
- *MAKE SENSE OF INFORMATION - Quickly make sense of, combine, and organize information into meaningful patterns
- *REACH CONCLUSIONS - Combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events)

Other abilities as required for successful performance in the lower-level series.

Additional Competency Requirements

- COMMUNICATION FOR RESULTS – Tailors communication style and method (vocabulary, pace, etc.) for the audience. Uses stories, analogies or examples that effectively illustrate a point. Asks open-ended questions that encourage others to give their point of view. Checks understanding by stating what he/she understands of the message and asking the speaker to verify or clarify.
- GROWTH MINDSET – Analyzes errors, successes and failures, and sets strategies to rectify and increase knowledge. Solicits performance feedback after each assignment. Identifies personal strengths and weaknesses and defines areas for self-development.
- INITIATIVE – Seeks out new challenges that require risk taking. Determines the resources, team support and technology necessary to enable success and procures them. Keeps responding to the challenge in spite of obstacles and setbacks.

- OWNERSHIP AND COMMITMENT – Sets objectives that meet organizational needs. Provides recommendations to individuals and teams on ways to improve performance and meet defined objectives. Determines the resources, team support and technical needs necessary to enable success and procures them. Keeps responding to the challenges in spite of obstacles and setbacks.
- CHANGE ADVOCATE – Participates in change programs by planning implementation activities with other change champions. Interprets the meaning of new strategic directions for the work group and sets objectives and standards. Implements monitoring and feedback systems. Evaluates progress and finds ways of making continuous improvements. Solicits and offers ideas for improving primary business processes. Improves effectiveness and efficiency through the involvement of peers and business partners by initiating new approaches.
- CUSTOMER PARTNERSHIP – Conducts dialogues about improvements at the project or departmental level. Identifies simple product and service improvement opportunities and creates basic cost-benefit proposals. Provides recommendations to customers regarding enhancements to existing products and services as well as solutions that align with strategic performance drivers. Regularly meets with customer representatives to give status reports, and maintains records on customer activities. Demonstrates respect for the opinions of others.
- DECISION MAKING – Applies values, business strategy, policies, precedent and experience to make complex decisions. Knows when he or she has enough information to make a decision and makes it. Considers the consequences of a decision and assesses the options before reaching a conclusion.
- LEADERSHIP – Allocates roles, accountabilities, major assignments and gives clear direction. Defines standards in terms of doing what is appropriate and doing it well. Provides guidance in how to strengthen knowledge and skills to improve personal performance. Recognizes and rewards people for their achievements.
- OUTCOME DRIVEN – Evaluates the effectiveness of current metrics in pursuit of improved performance indicators. Takes appropriate actions to ensure obligations are met. Demonstrates the ability to challenge existing practices in order to become more effective. Contributes to improve work methods, outcomes and team performance.
- SELF CONFIDENCE – Volunteers to try new activities that expose personal vulnerability. Offers ideas and information. Responds assertively when challenged. Takes risks that are commensurate with the potential benefits. Takes action to resolve conflict and issues.
- STRATEGIC BUSINESS PLANNING – Recommends departmental components of the strategic IT plan and its alignment with specific needs of business partners and assesses the plan's impact on budgets and capital expenditure. Provides detailed analysis and summary of departmental issues for strategic planning. Develops strategies, alternatives, and scenarios for reviewing project-specific initiatives. Tracks and reports progress against plan.
- STRATEGIC RELATIONSHIP MANAGEMENT – Conducts dialogue with customers that relates individual customer's operational requirements to the organizational strategy. Provides solutions that align short-term needs with strategic performance drivers.

Other competencies as required for successful performance in the lower-level series.

All employees of the City of Chicago must demonstrate commitment to and compliance with applicable state and federal laws, and City ordinances and rules; the City's Ethics standards; and other City policies and procedures.

The City of Chicago will consider equivalent foreign degrees, accreditations, and credentials in evaluating qualifications.

* May be required at entry.

City of Chicago
Department of Human Resources
March, 2023