



## INTRODUCTION TO BAYESIAN NETWORKS

A virtual, professional short course taught by the ITA Data Solutions Team

**October 19-21, 2021  
8:30 a.m. to 4:30 p.m.**

**Cost: \$1900**

**Register Now, Pay Later!:** <https://idiregistration.wufoo.com/forms/s1qi2efy12bfsxt/>.

**\*Virtual Course: A few participants may be able to participate, in person at the Vienna, Virginia office, pandemic conditions permitting. \***

Bayesian networks are probabilistic models that enable a user to understand an uncertain situation, explore what-ifs, and consider collection of new data. They synthesize knowledge from experts and case data.

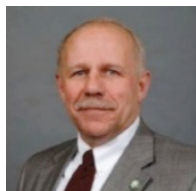
- Learn to elicit Bayesian network structures and probabilities from experts
- Build Bayesian networks from simple to real-world applications
- Dennis, Dave, and Joe teach from decades of experience applying Bayesian networks in national security, government, and industry
- Learn about building geospatial models in GeoNetica and combining Netica with discrete event simulation
- Learn about advances in Bayesian network tools and applications
- Practice learning Bayesian network structures and probabilities from data
- Rapid fire model building exercises to develop formulation expertise

Course emphasizes learning by doing. **Students need their laptops!** Also, come prepared with a problem you can work on during student workshop time. We will supply a free student version of the Netica software. This course contains several model-building exercises to allow students to develop formulation ability.

### Instructors:



**Dennis Buede**



**Dave Brown**



**Joe Tatman**



**Michael Resig**



**Day 1 –**

- Introduction
- Building a simple Bayesian network (BN) – drug testing
- Just enough probability
- A complete diagnostic BN – Liver diagnosis case study
- Elicitation of BN structure and probabilities
- Student Project Definition
- BN Process Models

**Day 2 –**

- Troubleshooting systems – Industrial system example
- D-Separation and sensitivity to findings
- Student Workshop (opportunity to work on your own BN problem)
- Learning probabilities for a BN from data
- Combining expert knowledge and data
- Learning structure for a BN from data
- Learning a BN with continuous variables

**Day 3 –**

- Netica API and programming
- Student Workshop
- Introduction to GeoNetica™
- Student Workshop

**Advanced topics available on a case-by-case basis**

- Decision making in Netica using influence diagrams
- Using the Netica library in the ExtendSim discrete event simulation
- Explore BN structure building using R

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\*Due to current COVID-19 social distancing guidelines, we will not process any course payments at this time, however, early registration is required to reserve your seat. Registrants will be contacted a week before training for payment.

For more information, contact: [dbuede@ita-intl.com](mailto:dbuede@ita-intl.com).