

## ON PROPERTIES OF $t$ -FUZZY MODULES AND UNIFORM $t$ -FUZZY MODULES

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### Abstract

In this paper, we extend the idea of fuzzy modules and uniform fuzzy modules to the concepts of  $t$ -fuzzy modules and uniform  $t$ -fuzzy modules, respectively. We give some characterizations and properties of  $t$ -fuzzy modules and uniform  $t$ -fuzzy modules.

**Keywords:** uniform fuzzy modules,  $t$ -fuzzy modules, uniform  $t$ -fuzzy modules.

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### REFERENCES

- [1] C. Burhan and B. Samruam, *On properties of uniform fuzzy modules and semiuniform fuzzy modules*, (will be appear).
- [2] P. Dheena and G. Mohanraaj, *T-fuzzy ideals in rings*, *Int. J. Comp. Cogn.* **9** (2011) 98–101.  
doi:10.12732/ijpam.v89i3.5
- [3] D. Dubois and H. Prade, *Fuzzy Sets and Systems: Theory and Applications* (New York, Academic Press, 1980).  
doi:10.1057/jors.1982.38
- [4] J.S. Golan, *Making modules fuzzy*, *Fuzzy Sets and Systems* **32** (1989) 91–94.  
doi:10.1016/0165-0114(89)90089-4

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- [5] U. Medhi and H.K. Saikia, *On  $T$ -fuzzy essential ideals of rings*, Int. J. Pure Appl. Math. **89** (2013) 343–352.  
doi:10.12732/ijpam.v89i3.5
- [6] X.V. Nagoita and D.A. Ralescu, *Applications of Fuzzy Sets and System Analysis* (Basel, Birkhauser, 1975).  
doi:10.1109/TSMC.1977.4309811
- [7] F. Pan, *Fuzzy finitely generated modules*, Fuzzy Sets and Systems **21** (1987) 105–113.  
doi:10.1016/0165-0114(87)90156-4
- [8] F. Pan, *Fuzzy quotient modules*, Fuzzy Sets and Systems **28** (1988) 85–90.  
doi:10.1016/0165-0114(88)90118-2
- [9] R. Rasuli, *Fuzzy modules over a  $t$ -norm*, Int. J. Open Prob. Compt. Math. **9** (2016) 12–18.  
doi:10.12816/0033740
- [10] A. Rosenfeld, *Fuzzy groups*, J. Math. Anal. Appl. **35** (1971) 512–517.  
doi:10.1016/0022-247x(71)90199-5
- [11] M. Ujwal and K. S. Helen, *On  $T$ -fuzzy essential ideals of rings*, Int. J. Pure and Appl. Math. **89** (2013) 345–352.  
doi:10.12732/ijpam.v89i3.5
- [12] L.A. Zadeh, *Fuzzy sets*, Inform. and Control **8** (1965) 228–258.  
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